Preface

The book *NTA/UGC NET Paper 1 - Theoretical Concepts and Practical Solutions* has been written afresh and covered whole syllabus of UGC NET Paper 1 (General Paper) i.e. *teaching aptitude, research aptitude, reading comprehensions, communication, logical & mathematical reasoning, data interpretation, information and communication technology, people and environment and higher education system.* The whole syllabus is divided into different units. Each unit covered all contents /topics in details in order to meet the requirement of UGC NET Syllabus. Several new Concepts and Multi Choice Questions taken as per according to latest examination pattern have been Incorporated as latest practical problems and MCQs with explanation at the end of each unit.

I have made every effort every effort to remove the printing errors from the book. Even then if the readers come across any error they are requested to point out the same to me, I am confident that this book will be very useful to UGC Aspirants.

I am highly thankful to M/s. National Press Association of their untiring efforts in bringing out this book well in time.

Constructive criticism and suggestions for improvement of the book are most welcome.

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Acknowledgement

First of all I would like to thank my family. The constant inspiration and guidance kept me focused and motivated. I am grateful to my father for giving me the life I ever dreamt. I can't express my gratitude for my Mom in words, whose unconditional love has been my greatest strength. I also express my gratitude for my wife Monika Jangra to help me in editing and formatting the book.

I am also thankful to Dr. Rajneesh Ahlawat, Assistant professor, Department of Business Administration, Chaudhary Devi Lal University, Sirsa for his inspiring guidance and support during writing this book. I express my thanks to Dr. Zafar Zahir, Managing Director, Synetic Business School Ludhiana to give some valuable remarks and suggestions for my book. I am also very thankful to Dr. Ajaipal Sharma, Assistant Professor, Central University of Haryana, Mahendergarh for his motivation and inspiration

I would like to acknowledge the special thanks to all faculty members of Synetic Business School Ludhiana and my colleagues to help me directly or indirectly.

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SYLLABUS

NTA/UGC NET Paper 1

Unit 1: Teaching Aptitude

Teaching: Nature, objectives, characteristics and basic requirements; Learner's characteristics; Factors affecting teaching; Methods of teaching; Teaching aids; Evaluation systems. UGC NET paper 1 Online Course

Unit 2: Research Aptitude

Research: Meaning, characteristics and types; Steps of research; Methods of research; Research Ethics; Paper, article, workshop, seminar, conference and symposium; Thesis writing: its characteristics and format.

Unit 3: Reading Comprehension

A passage to be set with questions to be answered. UGC NET paper 1 Online Course

Unit 4: Communication

Communication: Nature, characteristics, types, barriers and effective classroom communication.

Unit 5: Reasoning (Including Mathematical)

Number series; letter series; codes; > Relationships; classification.

Unit 6: Logical Reasoning

Understanding the structure of arguments; Evaluating and distinguishing deductive and inductive reasoning; Verbal analogies: Word analogy — Applied analogy; Verbal classification. Reasoning Logical Diagrams: Simple diagrammatic relationship, multidiagrammatic relationship; Venn diagram; Analytical Reasoning.

Unit 7: Data Interpretation

Sources, acquisition and interpretation of datag. 'P Quantitative and qualitative data; > Graphical representation and mapping of data.

Unit 8: Information and Communicating Technology (ICT)

ICT: meaning, advantages, disadvantages and uses; > General abbreviations and terminology; > Basics of the internet and e-mail. UGC NET paper 1 Online Course

Unit 9: People and Environment

People and environment interaction; Sources of pollution; Pollutants and their impact on human life, exploitation of natural and energy resources; Natural hazards and mitigation.

Unit 10: Higher Education System: Governance Polity and Administration

Structure of the institutions for higher learning and research in India; formal and distance education; professional/technical and general education; value education: governance, polity and administration; concept, institutions and their interactions.

Table of Contents

UNIT - 1

TEACHING APTITUDE

UNIT 1: TEACHING APTITUDE

CONTENTS:

TEACHING: NATURE, OBJECTIVES, CHARACTERISTICS AND BASIC REQUIREMENTS

DEFINITION OF TEACHING

Teaching is the process of attending to people's needs, experiences and feelings, and making specific interventions to help them learn particular things.Interventions commonly take the form of questioning, listening, giving information, explaining some phenomenon, demonstrating a skill or process, testing understanding and capacity, and facilitating learning activities (such as note taking, discussion, assignment writing, simulations and practice).

According to Bingham – "teaching aptitude is a specific ability, potentiality, interest, satisfaction and fitness in teaching profession".The teaching aptitude means an interest in the teaching work orientation, implementing teaching principles and methods. Under the gamut of teaching aptitude, teaching skill occupies a major place.

Every student is a different entity from the viewpoint of his intelligence, aptitude and interest. Under a particular situation, different students may have different perceptions, actions and reactions to a given issue/subject.

Teaching is a social process in which teacher influences the behaviour of the less experienced pupil and helps him develop according to the needs of the society. Effecting coordination among them could be a very difficult task for a teacher and is put to test only on such occasions.

Teaching is an art and science as well. It is a professional activity involving teacher and student with a view to the development of the student. Teaching is a system of actions varied in form and related with content and pupil behavior under the prevailing physical and social conditions.

Smith (1947)"considered teaching as a tripolar process involving (i) agent or source producing learning which may be human or material; (ii) a goal or target to be achieved; (iii) the intervening variables consisting of learning or teaching situation; involving human or physical conditions and instructional methods".

Amidon (1967) " Teaching as a process of interaction between the teacher and the taught as a cooperative enterprise, as a two-way traffic". The manner of teaching should be such that it makes the pupils feel at home in his class room. The teacher has to ensure that the learner is well adjusted to the environment which includes his classmates, school mates and other members of his society at large.

COMMON CHARACTERISTICS OF GOOD TEACHING

According to UNESCO (2004) and Scheerens (2004), the main characteristics of good teaching relate to a number of broad categories:

- ***Relevance:*** of the teaching content, in particular alignment with the curriculum.
- ***Sufficient learning time:*** this refers to the time devoted to actual teaching, as opposed to the official hours set in the curriculum.
- ***Structured teaching,*** in which learners' engagement is stimulated, their understanding monitored, and feedback and reinforcement regularly provided.
- A ***conducive classroom environment*** with, in particular, a task-oriented climate, mutual respect between the students and teacher and among students themselves, orderliness, and safety.
- Teachers with appropriate ***subject matter mastery, verbal intelligence,*** a broad teaching repertoire, and motivation to achieve.
- What research also underlines though is that ***adaptability to context*** matters as different countries and students may need different teaching contents (both in terms of subject matter knowledge and of medium of instruction) and different levels of structure tailored to students' profile. It is therefore important to critically assess the relevance of both current and planned objectives (in terms of the content, structure, and context of teaching and learning) to the national situation.

NATURE AND CHARACTERISTICS OF TEACHING

1. The main character of teaching is to provide guidance and training.
2. Teaching is interaction between teacher and students.
3. Teaching is an art to give knowledge to students with effective way.
4. Teaching is a science to educate fact and causes of different topics of different subjects.
5. Teaching is continues process.
6. Teacher can teach effectively, if he has full confidence on the subject.
7. Teaching encourages students to learn more and more.
8. Teaching is formal as well as informal
9. Teaching is communication of information to students. In teaching, teacher imparts information in interesting way so that students can easily understand the information.
10. Teaching is tool to help student to adjust himself in society and its environment.

LEARNERS CHARACTERISTICS

1. **Motivational Characteristics**
   a) **Self-efficacy:** Bandura defines the term perceived self-efficacy as a belief in one's capabilities to organize and execute the actions necessary to manage particular situations. Bandura also notes physiological and emotional states caninfluence individuals to interpret stress reactions and tension as indicator of vulnerability to poor performance. Therefore one way

to alter self-efficacy is to reduce stress and negative emotional tendencies. Those who believe they cannot manage threats experience high anxiety arousal. They view many aspects of their environment as fraught with danger (Bandura, 1993).

b) **Attribution Patterns:** Attribution research focuses on the ways that individuals arrive at casual explanations of what takes place in their lives. Success and failure perceived as due to internal causes such as personality ability or effort respectively raises or lowers self-esteem or self worth, whereas external attributions for positive or negative outcomes do not influence feelings about one (Weiner, 1985)

c) **Goal Orientation:Mastery Orientation (Learning goal):** Student's are concerned with developing skills, knowledge, understanding.Performance Orientation (Performance or ego goals): Student's more concerned with the outcome (performance) than the process/learning.

d) **Intrinsic/Extrinsic Motivation:** ***Intrinsic Motivation:*** Individual is self-directed. Could be derived from a desire for academic success, knowledge, or working with a positive self-esteem. ***Extrinsic Motivation:*** Individual is other directed. Could be a result of,

- ***Parental influences:*** Parents hold academic success in high regard and have high expectations for the learner.
- ***Rewards:*** These could be monetary or material rewards.
- ***Acknowledgement:*** Honor roll, or other academic awards, attention of other students/teacher.
- ***Classroom privileges for positive academic performances:*** These could range from free time, time in organized centers, or other opportunities that students are not guaranteed.

2. **Multiple Intelligence Characteristics**

Existential Intelligence: Students with existential intelligence are attuned to the human condition. They are able to comprehend issues like the significance of life and death and the experience of love:

Inter/Intrapersonal Intelligence: Interpersonallearners understand the mood and motivations of others enabling them to work and communicate effectively. They enjoy social activities. Intrapersonal learners have a deep awareness of their own inner feelings. They have a strong sense of independence and self-confidence.

Bodily-Kinesthetic Intelligence: Students who possess bodily-kinesthetic intelligence have the ability to work skillfully with objects involving both fine and gross motor skills. They are characterized by a well-developed sense of balance and motor control. In addition, they are skillful at translating intention into action. These students learn best by doing.

Visual-Spatial Intelligence: Spatial intelligence is characterized by a person's capacity to perceive the visual world and recreate aspects of it even in the absence of relevant stimuli. This intelligence is fundamentally tied to the concrete world and the locations of objects in that world.eg.,Play chess,Guess the mystery object inside a bag.

Musical/Naturalist Intelligence: No other intelligence emerges earlier than musical talent. Those who possess high levels of musical or rhythmic intelligence constantly hear tones, rhythms, and musical patterns in the environment and human voice, as well as music. The auditory sense is crucial, although not mandatory.

Logical-Mathematical Intelligence: The logical-mathematical intelligence initially develops through observation, manipulation, and handling of physical objects. In time, the thinking becomes more abstract. This intelligence is closely related to scientific thinking and deductive reasoning.

Verbal-Linguistic Intelligence: The power and love of the written and spoken word is at the heart of this intelligence. Reading, writing, listening, and speaking are the activities that represent this intelligence

3. **Prior Knowledge:**

Prior knowledge is the knowledge the learner already has before they meet new information. A learner's understanding of a text can be improved by activating their prior knowledge before dealing with the text, and developing this habit is good learner training for them.

4. **Economic/Home Life**

- Proper nutrition before school
- Appropriate/necessary school supplies
- Parents' ability to assist learner with academic/school related homework and activities.
- Parents' involvement in a teacher/parent relationship.

5. **Values:**

Our values are determined by the beliefs we hold which, in turn, will determine our behaviors. Beliefs are based on our worldview. One common worldview is naturalism; the idea that nothing exists outside of natural laws. Transcendentalism is the belief that nature is god and god is whatever you want it to be. Theism is the belief in a god whom you hold some responsibility to. The way you interpret the world will significantly affect what you value. Your values will then determine how you behave.

6. **Emotional intelligence:**

Emotional intelligence(EI) is the capability of individuals to recognize their own and other people's emotions, discern between different feelings and label them appropriately, use emotional information to guide thinking and behavior, and manage and/or adjust emotions to adapt to environments or achieve one's goal(s)

7. **Culture:** the ideas, customs, and social behaviour of a particular people
8. **Language**
9. **Social Skills:** A social skillis any skill facilitating interaction and communication with others. Social rules and relations are created, communicated, and changed in verbal and nonverbal ways. The process of learning these skills is called socialization.

10. **Health:** a person with good health learn better.

CHARACTERISTICS OF GOOD LEARNERS

Good learners are:

- Curious Creative
- Resilient in the face of challenges Able to embrace change Adaptable
- Collaborative
- Open to diverse viewpoints and experiences Respectful of others
- Respectful of the environment Compassionate
- Optimistic Nurturing Challenge seeking
- Engaged and enthusiastic
- Future oriented with a global perspective
- Intrinsically motivated
- Skills of Good learner
- Solve complex problems
- Make connections between present and future opportunities
- Think critically, reflectively

To know factor affecting teaching is so important because after analysis all factors which affecting teaching , teacher can improve himself and can become good teacher and create better citizen for country . If study teaching subjects , we find many factors which affecting teaching which can write in list of these factors.

1. **Educational qualification of teacher**

   Higher qualified teacher can provide high scholarly instructions which can effect than general graduate teacher. Many teachers hold different degrees which is the sign of their higher education qualification. A teacher is just B.A. and other teacher is M.A., M.Ed., PhD, if we compare both, then is sure that higher qualified teacher can cede good teaching result.

2. **Skills**

   Skill is an ability to do any work with better way. If a teacher has teaching skill then he can provide effective teaching. Often says that teaching is God gifted but getting good education training and Psychologize best educational books, we can get this skill and create better result. In teaching talent we can include following skills:

   - Communication skill of teacher
   - Taking teaching aids
   - Technique of teaching
   - Method of teaching
   - Human relation skill

3. **Experience of Teacher**

   Experience of teacher affects also the teaching. After increasing teaching experience, a teacher learns many new things in teaching experience which he can employ in next time teaching. First day teacher may not effect on students but after 5 years teaching, a teacher can more effect on students.

4. **Class – room environment**

   Class room environment effects also on teaching. This environment is made both by teacher and students. Without both active participation in education, teaching never effects. If the concentration lives in class room and students listen teacher's voice and teacher also cares the activity of teacher doing interacting with students.

5. **Economic Factor**

   Economic background of teacher and student is also affected teaching. Even salary of teacher effects on his thinking level. Poor and rich students can also classify economically and sometime these factors can effect on effective teaching.

6. **Administrative policies of school or college or university**

   Administrative policies also effect teaching. Teacher wants to instruct with his way but administrative policies is not allowed, so the voice of teach can stop and effect of teaching may slow in class room.

7. **Subject Matter**

   Sometime when a teacher teaches that subject in which he is not specialize , he can not create any effect through his teaching but same teacher can teaches his specialize subject with better way .

8. **Parental expectations**

   What are the expectations of parent on students? This factor can be defined psychologically. If parent wants to frame up his children doctor or engineer and continually stress on student, sometime student may not at that rank, so mentally he can create depression and which can stop effective teaching of teacher.

TYPES OF TEACHING METHODS

There are different types of teaching methods which can be categorised into three broad types. These are teacher-centred methods, learner-centred methods, content-focused methods and interactive/participative methods.

(a) Instructor/Teacher Centred Methods

Here the teacher casts himself/herself in the role of being a master of the subject matter. The teacher is looked upon

by the learners as an expert or an authority. Learners on the other hand are presumed to be passive and copious recipients of knowledge from the teacher. Examples of such methods are expository or lecture methods - which require little or no involvement of learners in the teaching process. It is also for this lack of involvement of the learners in what they are taught, that such methods are called "closed-ended".

(b) Learner-Centred Methods

In learner-centred methods, the teacher/instructor is both a teacher and a learner at the same time. In the words of Lawrence Stenhouse, the teacher plays a dual role as a learner as well "so that in his classroom extends rather than constricts his intellectual horizons". The teacher also learns new things everyday which he/she didn't know in the process of teaching. The teacher "becomes a resource rather than an authority". Examples of learner-centred methods are discussion method, discovery or inquiry based approach and the Hill's model of learning through discussion (LTD).

(c) Content-Focused Methods

In this category of methods, both the teacher and the learners have to fit into the content that is taught. Generally, this means the information and skills to be taught are regarded as sacrosanct or very important. A lot of emphasis is laid on the clarity and careful analyses of content. Both the teacher and the learners cannot alter or become critical of anything to do with the content. An example of a method which subordinates the interests of the teacher and learners to the content is the programmed learning approach.

(d) Interactive/Participative Methods

This fourth category borrows a bit from the three other methods without necessarily laying emphasis unduly on the learner, content or teacher. These methods are driven by the situational analysis of what is the most appropriate thing for us to learn/do now given the situation of learners and the teacher. They require a participatory understanding of varied domains and factors.

SPECIFIC TEACHING METHODS

We can now consider a number of specific methods which can be drawn from in the course of classroom instruction. It is however, important to note that the choice of any form of methods should not be arbitrary, but needs to be governed by the criteria we have already examined. At the same time each method is not fool-proof, but has its own advantages and disadvantages. That is why I would recommend the use of complementary methods rather than one method.

1. Lecture Method

A lecture is an oral presentation of information by the instructor. It is the method of relaying factual information which includes principles, concepts, ideas and all *THEORETICAL KNOWLEDGE* about a given topic. In a lecture the instructor tells, explains, describes or relates whatever information the trainees are required to learn through listening and understanding. It is therefore teacher-centred. The instructor is very active, doing all the talking. Trainees on the other hand are very inactive, doing all the listening. Despite the popularity of lectures, the lack of active involvement of trainees limits its usefulness as a method of instruction.

The lecture method of instruction is recommended for trainees with very little knowledge or limited background knowledge on the topic. It is also useful for presenting an organised body of new information to the learner. To be effective in promoting learning, the lecture must involve some discussions and, question and answer period to allow trainees to be involved actively.

Preparation and Delivery of a Lecture

As stated earlier, during the lecture, the trainees merely listen to the instructor. It is therefore very important to consider the attention span of trainees when preparing a lecture. The attention span is the period of time during which the trainees are able to pay full attention to what the instructor is talking about. It is estimated to be 15-25 minutes only. It is difficult to hold the trainees attention for a long period of time and careful preparation of lectures is very necessary. The instructor should have a clear, logical plan of presentation. He/she should work out the essentials of the topic, organise them according to priorities and logical connections, and establish relationships between the various items. Careful organisation of content helps the trainees to structure and hence, to store or remember it. When developing a theme in a lecture, the instructor should use a variety of approaches. A useful principle in any instruction is to go from the KNOWN to UNKNOWN; from SIMPLE to COMPLEX, or from PARTS to a WHOLE. Knowing the trainees and addressing their needs and interests is very important. For example, in explaining technical processes the instructor should search for illustrations that will be familiar to the trainees. Unfamiliar technical words should be introduced cautiously. New terminologies should be defined and explained and examples given.

In order to gain and focus the attention of trainees, the instructor should be adequately prepared, fluent in his/her presentation and should use various teaching aids and illustrations such as charts, transparencies, codes and even the real objects during presentation. Question and Answer periods should be included in the lecture.

Qualities of a Good Lecture

1. A good lecture should not be too long as to exceed the trainees' attention span (up to 25 minutes).
2. A good lecture should address a single theme.
3. In a good lecture technical terms are carefully explained.
4. Familiar examples and analogies are given.
5. A good lecture establishes fluency in technical content.
6. A good lecture uses illustrations and examples.
7. A good lecture builds on existing knowledge.
8. A good lecture employs a variety of approaches.

2. The Discussion Method

Discussion involves two-way communication between participants. In the classroom situation an instructor and trainees all participate in discussion. During discussion, the instructor spends some time listening while the trainees spend sometimes talking. The discussion is, therefore, a more active learning experience for the trainees than the lecture.

A discussion is the means by which people share experiences, ideas and attitudes. As it helps to foster trainees involvement in what they are learning, it may contribute to desired attitudinal changes. Discussion may be used in the classroom for the purpose of lesson development, making trainees apply what they have learnt or to monitor trainees learning by way of feedback.

Lesson Development

In areas in which trainees already have some knowledge or experience, discussion may be used to develop the main points to be covered in a lesson. For example, in safety training many of the procedures and behaviour that should be observed can be established through discussion with trainees. Trainees can draw on their experience of working in workshops contract sites to contribute to the discussion. In discussing some issues, differences of opinion arise. The discussion can help to clarify the different points of view and may assist each trainee to define his or her own opinion. Used in this way, discussion may be more effective in motivating trainees than lectures. Trainees can see that some importance is attached to their contributions.

Application

Discussion may also be used, following a lecture or demonstration, to help trainees apply what they have learned. The instructor can ask questions that help trainees to relate concepts and principles to contexts that are familiar to the trainees or in which they will ultimately be needed. For example following a lecture on "types of wood joint", the instructor may, lead a discussion directing trainees attention to the places or pieces of furniture where each type is found, and the reasons for using one type than the other. Used in this way discussion contributes to the transfer of learning.

Feedback

The discussion method also provides an opportunity to monitor trainees learning. The answers provided by trainees and the questions they ask, reveal the extent and quality of learning taking place. Instructors can use this information to repeat or modify an explanation to improve learning. They can also provide feedback to trainees, thereby helping to reinforce learning that has taken place. Discussion used in this way should follow after other methods of classroom instruction such as lectures, demonstration or practice sessions.

Conducting A Discussion

Discussion sessions can be led by the instructor, or can take place in groups. In either case, the goal is to meet the lesson objectives by allowing the trainees to:-

a. Relate relevant personal experiences or events which have occurred in the work setting.
b. Contribute ideas or personal opinions.
c. Apply what have been learned to familiar situations or solving problems.
d. Express what had been learned.

Whether the discussion is instructor led or takes place in groups it must be guided by the instructor. It must be focused on the objectives of the lesson: it is the instructors responsibility to see that the objectives are met. If it is not properly guided, a discussion can degenerate into a consideration of inappropriate or unimportant topics adding confusion rather than clarification to the lesson.

2. <u>The Demonstration Lesson</u>

"The most effective way to teach an occupational skill is to demonstrate it... one of the two most essential teaching skills is the ability to demonstrate; the other is the ability to explain. Both are vital to the success of either an operation lesson or an information lesson". Weaver and Cencil in *APPLIED TEACHING TECHNIQUES*.

Definition

Demonstration means any planned performance of an occupation skill, scientific principle or experiment.

Teacher Preparation

1. Rehearse your presentation in advance of the lesson.
2. Anticipate any difficult steps, possible interruptions e.t.c.
3. Obtain all materials, tools, equipment, visual and teaching aids in advance and check their useful condition.
4. Have all materials within reach and conveniently arranged.
5. Time the demonstration NOT to exceed 15 minutes.
6. Remove all extraneous materials; check lighting, visibility, student grouping, and proximity to electric, gas and water outlets.
7. Plan to use a skill or method to advantage; work from simple to complex, one step at a time.

Presentation

1. Make sure all students can see and hear the lesson.
2. Be enthusiastic, professional, effective but not dramatic.
3. Relax; use any mishaps or humour to YOUR advantage.
4. Observe all safety rules and procedures.
5. Keep eye-contact with the class; ask and encourage class questions.
6. Explain WHY and HOW: use the techniques of SHOW and TELL.
7. Use a medial summary to strengthen your explanation.

Precautions

1. Avoid interruptions; keep demonstration smooth and continuous.
2. Never demonstrate on a student's material.

3. Work towards one aim.
4. Allow time for possible student participation.

Carrying out a Demonstration

1. Give a good performance. Remember that the trainees learn by your good example.
2. Explain each step or process as you proceed. Follow your lesson plan.
3. Make sure the trainees see the demonstration from the angle they will perform itthemselves.
4. Be sure everyone can see and hear. Maintain eye contact.
5. Emphasize key points, and if possible prepare beforehand ask key questions as you go along and allow trainees to ask questions.
6. Observe all safety rules, precautions and procedures; and emphasizes them.
7. Use proper instructions, aids such as chalkboard, charts, handouts etc. to support your demonstration.
8. Provide for trainees participation where possible, during and after demonstration.
9. Demonstrate the correct way only. First impressions are important, therefore, make them correct ones.
10. Always summarize the steps and emphasize key points again.

After Demonstration

1. Return all items used during demonstration to their storage places.
2. Make arrangements to have the trainees practice the skill as soon as possible in a practical class session.
3. Observe and analyze trainee(s) performance and correct mistakes.
4. Offer reinforcement where necessary.
5. Coach weak or slow trainees.
6. Check trainee's completed work for accurate performance and record.
7. Allow sufficient time interval before demonstrating another operation.

4. Buzz Groups

Another method of instruction is the buzz group. During a longer session, the plenary group can break into sub-groups to discuss one or two specific questions or issues. The room soon fills with noise as each sub-group 'buzzes' in discussion. If appropriate, after the discussion one member of each group can report its findings back to the plenary. Buzz groups can be in pairs, trios, or more depending on the activity. People turn to their neighbors for a quick buzz, or form larger groups of three or more. This allows almost everyone to express an opinion. While they are buzzing, participants are able to exchange ideas and draw on their wide collective experience. It may provide a good opportunity for trainees to reflect on the content of a lecture. A good buzz session will generate many ideas, comments and opinion, the most important of which will be reported back.

Buzz groups help trainers as they allow you to:

- Draw your breath
- Gauge the mood, by listening to some of the discussions
- Change pace of the session
- Encourage participants to reflect on what they have learnt and how they might apply it in their work.

Disadvantages

The main obstacle using buzz sessions lie in unfamiliarity with their use, the time required, the need for leaders or facilitators within each sub-group, and the need to have tables and chairs arranged for quick and easy discussion.

5. Brainstorming

The purpose of a brainstorming session is to discover new ideas and responses very quickly. It is particularly a good way of getting bright ideas. It differs from the buzz groups discussion in that the focus is on generating as many ideas as possible without judging them. In this technique, all ideas are given equal credence.

Participants are encouraged to let ideas flow freely, building on and improving from previous ideas. No idea, however crazy, should be rejected. These ideas are listed exactly as they are expressed on a board or flipchart, or written on bits of paper. The combination of swiftly generated ideas usually leads to a very animated and energising session. Even the more reserved participants should feel bold enough to contribute. The purpose of listing responses is to collect existing experiences and thoughts.

It is useful to collect answers to questions when you expect much repetition in the responses.

After a brainstorm session, the ideas can be discussed further and evaluated, for example listing the best options in a systematic way. Ideas can be grouped and analysed so that they belong to the group rather then individuals. Unlike a buzz session, a brainstorm session can work well with a large group and usually takes less time. It is best to limit the time for plenary brainstorms, as you might lose the attention of some participants.

6. Role Plays

In role plays, participants use their own experiences to play a real life situation. When done well, role plays increase the participants self-confidence, give them the opportunity to understand or even feel empathy for other people's viewpoints or roles, and usually end with practical answers, solutions or guidelines. Role plays are useful for exploring and improving interviewing techniques and examining the complexities and potential conflicts of group meetings. They help participants to consolidate different lessons in one setting and are good energizers.

However, role plays can be time-consuming and their success depends on the willingness of participants to take active part. Some trainees may feel a role play is too exposing, threatening or embarrassing. This reluctance may be

overcome at the outset by careful explanation of the objectives and the outcome. Some role plays can generate strong emotions amongst the participants. It is therefore essential that a role play is followed by a thorough debriefing. Tis provides the opportunity for the trainer and the participants to raise and assess new issues.

INSTRUCTIONAL METHODS AND THEIR APPLICATIONS

METHOD	Uses	ADVANTAGES	DISADVANTAGES
THE LECTURE METHOD A formal or semi-formal discourse is which the instructor presents a series of events, facts, or principles, explores a problem or explains relationships	1. To orient students. 2. To introduce a subject. 3. To give directions on procedures. 4. To present basic material. 5. To introduce a demonstration, discussion, or performance. 6. To illustrate application of rules, principles, or concepts. 7. To review, clarify, emphasize or summarize.	1. Saves time. 2. Permits flexibility. 3. Requires less rigid space requirement. 4. Permits adaptability. 5. Permits versatility. 6. Permits better centre over contact and sequence.	1. Involves one way communication. 2. Poses problems in skill teaching. 3. Encourages student passiveness. 4. Poses difficulty in gauging student reaction. 5. Require highly skilled instructors.
THE DISCUSSION METHOD A method in which group discussion techniques are used to reach instructional objectives.	1. To develop imaginative solutions to problems. 2. To stimulate thinking and interest and to secure student participation. 3. To emphasize main teaching points. 4. To supplement lectures, reading, or laboratory exercises. 5. To determine how well student understands concepts and principles. 6. To prepare students for application of theory of procedure. 7. To summarise, clarify points or review.	1. Increase students interest 2. Increases students' acceptance and commitments. 3. Utilizes student knowledge and experience. 4. Results in more permanent learning because of high degree of student participation.	1. Require highly skilled instructor. 2. Requires preparation by student. 3. Limits content. 4. Consumes time. 5. Restricts size of groups.
THE PROGRAMMED INSTRUCTION METHOD A method of self-instruction	1. To provide remedial instruction. 2. To provide make-up instruction for late arrivals, absentees, or translents. 3. To maintain previously learned skills which are not performed frequently enough. 4. To provide retraining on equipment and procedures which have become obsolete. 5. To upgrade production.	1. Reduce failure rate. 2. Improves end-of- course proficiency. 3. Saves time. 4. Provides for self instruction.	1. Require local or commercial preparation. 2. Requires lengthy programmer training. 3. Increases expenses. 4. Requires considerable lead time.

	6. To accelerate capable students. 7. To provide enough common background among students. 8. To provide the review and practice of knowledge and skills.		
THE STUDY ASSIGNMENT METHOD A method in which the instructor assigns reading to books, periodicals, project or research papers or exercises for the practice.	1. To orient students to a topic prior to classroom or Laboratory work. 2. To set the stage for a lecture demonstration or discussion. 3. To provide for or capitalise on individual differences in ability, background, or experience through differentiated assignments. 4. To provide for the review of material covered in class or to give practice. 5. To provide enrichment material.	1. Increase coverage of material. 2. Reduce classroom time. 3. Permits individual attention.	1. Require careful planning and follow up. 2. Poses evaluation problem. 3. Produce non-standard results.

THE TUTORIAL METHOD A method of instruction in which an instructor works directly with an individual student.	1. To reach highly complicated skills operations or operations involving danger or expensive equipment. 2. To provide individualised remedial assistance.	1. Permits adaptive instruction. 2. Stimulates active participation. 3. Promotes safety.	1. Requires highly competent instructor. 2. Demands time and money.
THE SEMINAR METHOD A tutorial arrangement involving the instructor and groups, rather than instructor and individual.	1. To provide general guidance for a group working on an advanced study or research project. 2. To exchange information on techniques and approaches being explored by members of a study or research group. 3. To develop new and imaginative solutions to problems under study by the group.	1. Provides motivation and report. 2. Stimulates active participation. 3. Permits adaptive instruction.	1. Requires highly competent instructor. 2. Poses evaluation problems. 3. Is more costly than most other methods.
THE DEMONSTRATION METHOD A method of instruction where the instructor by actually performing an operation or doing a job shows the students what to do, how to do it, and through explanations brings out why, where, and when it is done.	1. To teach manipulative operations or procedures. 2. To teach troubleshooting. 3. To illustrate principles. 4. To teach operation or functioning of equipment. 5. To teach teamwork. 6. To set standards of workmanship. 7. To teach safety procedures.	1. Minimise damage and waste 2. Saves time 3. Can be presented to large groups.	1. Require careful preparation and rehearsal. 2. Requires special classroom arrangements.
THE DEMONSTRATION METHOD A method of instruction is required to perform under controlled conditions the operations, skills or movement being taught.	1. To teach manipulative operations or procedures. 2. To teach operation or functioning of equipment. 3. To teach team skills 4. To teach safety procedures.	1. Builds confidence. 2. Enable learning evaluation. 3. Reduces damages and waste. 4. Promotes safety.	1. Requires tools and equipment. 2. Requires large block. 3. Requires more instructors.
THE BUZZ GROUP	1. To develop and express imaginative ideas, opinions. 2. Stimulate thinking.	1. Help trainers to draw breath. 2. Gauge the mood by listening to some discussion. 3. Change pace of discussion. 4. Encourage participants to reflect what was learnt.	1. Unfamiliarity in use. 2. Time required. 3. Need for group leaders.

BRAINSTORMING	1. Discover new ideas, thoughts and responses very quickly.	1. Leads to a very animated and energising session. 2. More reserved participants feel free to contribute.	1. It takes time particularly if it is a large group. 2. May consume a lot of material e.g. flipcharts or writing materials. 3. Requires high level facilitation skills.
ROLE PLAYS	1. Exploring and improving interviewing techniques and examining complexities and potential conflicts of groups. 2. To consolidate different lessons in one setting.	**1.**Good energizers. **2.**Promotes empathy of trainees for other situation. **3.**Encourrages creativity in learning.	1. Participants might be reluctant. 2. May not work with trainees who do not know each other well.

TEACHING AIDS

Meaning of Teaching Aids

As we all know that today's age is the age of science and technology. The teaching learning programmes have also been affected by it. The process of teaching - learning depends upon the different type of equipment available in the classroom.

Need of Teaching Aids

1) Every individual has the tendency to forget. Proper use of teaching aids helps to retain more concept permanently.
2) Students can learn better when they are motivated properly through different teaching aids.
3) Teaching aids develop the proper image when the students see, hear taste and smell properly.
4) Teaching aids provide complete example for conceptual thinking.
5) The teaching aids create the environment of interest for the students.
6) Teaching aids helps to increase the vocabulary of the students.
7) Teaching aids helps the teacher to get sometime and make learning permanent.
8) Teaching aids provide direct experience to the students.

Types of Teaching Aids

There are many aids available these days. We may classify these aids as follows-

- Visual Aids
- Audio Aids
- Audio - Visual Aids

1) Visual Aids

The aids which use sense of vision are called Visual aids. For example :- actual objects, models, pictures, charts, maps, flash cards, flannel board, bulletin board, chalkboard, overhead projector, slides etc. Out of these black board and chalk are the commonest ones.

2) Audio Aids

The aids that involve the sense of hearing are called Audio aids. For example :- radio, tape recorder, gramophone etc.

3) Audio - Visual Aids

The aids which involve the sense of vision as well as hearing are called Audio- Visual aids. For example: - television, film projector, film strips etc.

Importance of teaching aids

Teaching aids play an very important role in Teaching- Learning process. Importances of Teaching aids are as follows:-

1) Motivation

Teaching aids motivate the students so that they can learn better.

2) Clarification

Through teaching aids, the teachers clarify the subject matter more easily.

3) Discouragement of Cramming

Teaching aids can facilitate the proper understanding to the students which discourage the act of cramming.

4) Increase the Vocabulary

Teaching aids helps to increase the vocabulary of the students more effectively.

5) Saves Time and Money

6) ***Classroom Live and active***
Teaching aids make the classroom live and active.
7) ***Avoids Dullness***
8) ***Direct Experience***
Teaching aids provide direct experience to the students

EVALUATION SYSTEM

Methods of Evaluating Teaching

Evaluation of teaching can have many purposes, including collecting feedback for teaching improvement, developing a portfolio for job applications, or gathering data as part of personnel decisions, such as reappointment or promotion and tenure. Most of the methods described below can be used for all of these functions. In general, efforts to collect information for improvement can be informal and focus on specific areas an individual instructor wishes to develop. Information for job applications involves presenting one's best work and meeting the requirements outlined in job ads. However, when the purpose of evaluation is personnel decision making, it is important to use a comprehensive and systematic process. Because there are many dimensions to pedagogical work, it is best to use multiple measures involving multiple sources of data to evaluate the range of instructional activities, which can include the following:

- Instructional Delivery (including quality, amount, and level of classroom instruction)
- Course Planning (including development of course materials, course revision, development of new courses)
- Grading and Assessing Student Learning (including appropriate level of assignments, exams, grading standards)
- Course Management (including supervision of GSIs)
- Oversight of Independent Studies, Honors Theses, Prelims, Dissertations
- Support for Student Internships, Experiential Learning, Service Learning
- Department and Curricular Work (including participation in curriculum revision, departmental efforts to focus on teaching)
- Advising and Mentoring
- Professional Development and Innovation Around Teaching

What follows are multiple methods for collecting information about instructors' activities, accomplishments, and effectiveness in teaching, in the classroom and beyond. While this list includes best practices for using student ratings, it also offers suggestions for ensuring that student ratings are not the only source of evidence used to assess instructional effectiveness, an approach consistent with research. In addition, detailed resources are available on the topics of student ratings of instruction, peer review of teaching, course portfolios, and teaching portfolios.

To set up an appointment with a CRLT consultant to discuss teaching evaluation methods, complete our consultation request form.

Evidence That Can Be Collected From Students

Student ratings

- U-M Office of the Registrar: U-M Online Student Ratings System
- Using Ratings Results for Improvement or Decision Making
- Overviews of the Research on Student Ratings

Midterm Student Feedback to provide information for improvement (generally not recommended for personnel decisions unless an instructor chooses to include results in a portfolio)

Student letters, solicited from the whole class by the department

Examples of student work that show what students accomplished in the course (e.g., samples of A, B, C work along with a grade distribution; comparisons of student work at the beginning and end of term to document growth)

Online surveys, such as SurveyMonkey, designed by individual instructors, departments or units (possibly done as alumni surveys: "…Now that you've completed your course…")

Feedback from advisees (including MA and PhD students, as well as undergraduate research assistants)

Evidence That Can Be Collected From Colleagues/Chairs/GSIs

- Peer Observation Guidelines and Recommendations
- Classroom Observation Instruments
- Reviews by colleagues of course materials (e.g., syllabi, assignments, activities)(pdf)
- Letters from GSIs who have been supervised by the instructor

Evidence That Instructors Can Collect on Their Own

- Reflective statement on a particular course with short sections on the goals of the course, teaching methods used, and the effectiveness of the course in helping students achieve goals
- Scholarship of teaching and learning projects or other research efforts undertaken to assess student learning
- Professional development efforts around teaching (e.g., attending workshops and seminars, consultations on teaching, midterm student feedback, etc.)

Description of work on curriculum development, GSI training, or other aspects of the department's educational mission

Faculty, Departmental, and School Responsibilities

To ensure that the evaluation system adopted is credible and acceptable, faculty members must have a strong hand in its development. Before departments and schools adopt teaching evaluation systems, the faculty members should determine their criteria

for effective teaching. Departments and schools can then take responsibility for developing their own evaluation methods and evaluation criteria that can be flexible to accommodate diversity in instructional methods (e.g., lecture, discussion, lab, case study, small group interaction, practicum, studio, field work, clinical work, etc.).

5 WAYS TO IMPROVE TEACHER EVALUATION SYSTEMS

Current approaches to assessing teacher effectiveness aren't working. The instruments used for observation are overly complicated, and training for observers is often inadequate. Furthermore, the challenges associated with the use of student achievement data, and the political nature in which these processes were mandated in the first place, all make this a very challenging problem to address. Indeed, a recent report by the Brookings Institution suggests that "teacher observations have been a waste of time and money."

But evaluation systems are a central to ensuring quality teaching. A meaningful evaluation system benefits both teachers and students. How might we leverage evaluation to build systems of support that not only help teachers reflect upon and improve their practice but also ensure that all students are leaving our schools with the knowledge and skills they need to live the lives they deserve?

Recent research indicates that instructional coaching is the most effective strategy for improving instructional practice. And isn't the evaluation cycle really just a formal coaching cycle? If not, why not? To quote former U.S. Secretary of Education John King, "If teacher evaluation feels like a 'gotcha' system, it won't work."

Here are five specific approaches to redesigning meaningful evaluation systems toward improving teachers' practice.

1. **Streamline and implement tools flexibly.**

   Current evaluation rubrics are simply too big—observers can't provide meaningful feedback to teachers on dozens of indicators based on a few 30- to 60-minute observations. Streamlined tools like TNTP's Core Teaching Rubric and the Insight Core Framework from Insight Education Group can home in on a narrow, prioritized set of instructional expectations to more effectively focus the observation process.

2. **Design systems as a formative feedback process.**

   Moving from "gotcha"—a compliance-driven process with a single score at the end of the year—to a growth-oriented process requires more formative, ongoing feedback from those tasked with evaluating teachers.

   For example, in addition to being observed by administrators, teachers at Denver Public Schools are now observed by peers and teacher leaders as well, enabling more frequent observations and feedback conversations. Teachers have reacted positively to these changes—they appreciate the new focus on their ongoing growth rather than an observation score. Meaningful feedback can help them continually improve their practice, a goal to which all evaluation systems should aspire.

3. **Support evaluators to be coaches.**

   Evaluators may not have the skills needed to provide coaching, so professional learning opportunities that emphasize effective coaching and support will be needed. Fortunately, there are many approaches that can work here: Video observation exercises, classroom walk-throughs, and deliberate practice with effective coaching conversations can be implemented with some frequency. Likewise, instructional coaches should be included as part of the evaluation process. After all, they are likely collecting the most data on the instructional practice of the educators they support.

4. **Involve more people.**

   Evaluation systems will never work if we continue to rely on a single school administrator (or small administrative team) to evaluate all teachers. In addition to instructional coaches, as mentioned above, peers can offer valuable insights to help teachers improve their practice. Teachers have shown more growth, and are generally happier with evaluation processes, when they are involved in both giving and receiving feedback.

   This can be done informally with a few colleagues who are also interested in deepening their own practice or more formally as part of the coaching cycle. Engaging others in the process will increase the frequency and breadth of feedback conversations, reduce the inefficiencies of relying on a single observer, and create opportunities for more frequent, formative conversations about classroom practice.

5. **Use video tools to allow educators to focus on meaningful feedback conversations.**

   The biggest complaint I hear from administrators in the field is that robust evaluation systems take too much time. Video can help educators streamline the process: Teachers can record themselves and submit videos to be viewed later by evaluators and/or peers for observation and coaching.

   Additionally, tech platforms provide an opportunity to effectively manage coaching and evaluation processes while also collecting data for providing targeted support and professional learning.

   There's no doubt that this work is hard, but a focus and commitment to making teacher evaluation work for teachers might actually be what we need. The work of Kathryn Procope, principal of Howard University Middle School, gives me hope. She has transformed the evaluation process in her school to be one of ongoing feedback and coaching, and has done it through many of the points above. By leveraging both in-person and video observations, engaging regularly with teachers in the feedback process, providing bite-sized feedback on a narrow set of expectations, and focusing on the formative growth of her teachers, she has blurred the line between evaluation and support.

   The students in our classrooms deserve the best teaching that we can provide, and their teachers deserve our best thinking and support. Most of us have been teachers, and few of us rave about the support that we received as teachers. It's time for us to take the opportunity to give teachers—and students—the support they want, need, and deserve.

TEACHING STYLE

No two teachers are alike, and any teacher with classroom teaching experience will agree that their style of teaching is uniquely their own. An effective teaching style engages students in the learning process and helps them develop critical thinking

skills. Traditional teaching styles with large groups of students. The pure lecture style is most suitable for subjects like history that necessitate memorization of key facts, dates, names, etc.

Teaching Style Vs Learner Style

Learner Style \ Teaching Style	Authority, Expert	Motivator, Salesperson	Facilitator	Delegator
Dependent Learner	Match	Near Match	Mismatch	Severe Mismatch
Interested Learner	Near Match	Match	Near Match	Mismatch
Involved Learner	Mismatch	Near Match	Match	Near Match
Self-directed Learner	Severe Mismatch	Mismatch	Near Match	Match

What are the typical styles of teaching?

The following list of teaching styles highlights the five main strategies teachers use in the classroom, as well as the benefits and potential pitfalls of each respective teaching method.

1. ***Authority, Or Lecture Style***

   The authority model is teacher-centered and frequently entails lengthy lecture sessions or one-way presentations. Students are expected to take notes or absorb information.

   - **Pros**: This style is acceptable for certain higher-education disciplines and auditorium settings
   - **Cons**: It is a questionable model for teaching children because there is little or no interaction with the teacher.

2. ***Demonstrator, or Coach Style***

   The demonstrator retains the formal authority role while allowing teachers to demonstrate their expertise by showing students what they need to know.

   - **Pros**: This style gives teachers opportunities to incorporate a variety of formats including lectures, multimedia presentations and demonstrations.
   - **Cons**: Although it's well-suited for teaching mathematics, music, physical education, arts and crafts, it is difficult to accommodate students' individual needs in larger classrooms.

3. ***Facilitator, or Activity Style***

   Facilitators promote self-learning and help students develop critical thinking skills and retain knowledge that leads to self-actualization.

   - **Pros**: This style trains students to ask questions and helps develop skills to find answers and solutions through exploration; it is ideal for teaching science and similar subjects.
   - **Cons**: Challenges teacher to interact with students and prompt them toward discovery rather than lecturing facts and testing knowledge through memorization.

4. ***Delegator, or Group Style***

   The delegator style is best-suited for curriculum that requires lab activities, such as chemistry and biology, or subjects that warrant peer feedback, like debate and creative writing.

   - **Pros**: Guided discovery and inquiry-based learning places the teacher in an observer role that inspires students by working in tandem toward common goals.
   - **Cons**: Considered a modern style of teaching, it is sometimes criticized as newfangled and geared toward teacher as consultant rather than the traditional authority figure.

5. ***Hybrid, or Blended Style***

   Hybrid, or blended style, follows an integrated approach to teaching that blends the teachers' personality and interests with students' needs and curriculum-appropriate methods.

   - **Pros**: Achieves the inclusive approach of combining teaching style clusters and enables teachers to tailor their styles to student needs and appropriate subject matter.
   - **Cons**: Hybrid style runs the risk of trying to be too many things to all students, prompting teachers to spread themselves too thin and dilute learning.

   Because teachers have styles that reflect their distinct personalities and curriculum — from math and science to English and history — it's crucial that they remain focused on their teaching objectives and avoid trying to be all things to all students.

Teaching Styles

- **Expert**: Similar to a coach, experts share knowledge, demonstrate their expertise, advise students and provide feedback to

improve understanding and promote learning.

- **Formal authority**: Authoritative teachers incorporate the traditional lecture format and share many of the same characteristics as experts, but with less student interaction.
- **Personal model**: Incorporates blended teaching styles that match the best techniques with the appropriate learning scenarios and students in an adaptive format.
- **Facilitator**: Designs participatory learning activities and manages classroom projects while providing information and offering feedback to facilitate critical thinking.
- **Delegator**: Organizes group learning, observes students, provides consultation, and promotes interaction between groups and among individuals to achieve learning objectives.

In short, modern methods of teaching require different types of teachers — from the analyst/organizer to the negotiator/consultant. Here are some other **factors to consider** as teachers determine the best teaching method for their students.

- **Empty vessel**: Critics of the "sage on the stage" lecture style point to the "empty vessel" theory, which assumes a student's mind is essentially empty and needs to be filled by the "expert" teacher. Critics of this traditional approach to teaching insist this teaching style is outmoded and needs to be updated for the diverse 21st-century classroom.
- **Active vs. passive**: Proponents of the traditional lecture approach believe that an overemphasis on group-oriented participatory teaching styles, like facilitator and delegator, favor gifted and competitive students over passive children with varied learning abilities, thereby exacerbating the challenges of meeting the needs of all learners.
- **Knowledge vs. information**: Knowledge implies a complete understanding, or full comprehension, of a particular subject. A blend of teaching styles that incorporate facilitator, delegator, demonstrator, and lecturer techniques helps the broadest range of students acquire in- depth knowledge and mastery of a given subject. This stands in contrast to passive learning, which typically entails memorizing facts, or information, with the short-term objective of scoring well on tests.
- **Interactive classrooms**: Laptops and tablets, videoconferencing and podcasts in classrooms play a vital role in today's teaching styles. With technology in mind, it is imperative that teachers assess their students' knowledge while they are learning. The alternative is to wait for test results, only to discover knowledge gaps that should have been detected during the active learning phase.
- **Constructivist teaching methods**: Contemporary teaching styles tend to be group focused and inquiry driven. Constructivist teaching methods embrace subsets of alternative teaching styles, including modeling, coaching, and test preparation through rubrics scaffolding. All of these are designed to promote student participation and necessitate a hybrid approach to teaching. One criticism of the constructivist approach is it caters to extroverted, group-oriented students, who tend to dominate and benefit from these teaching methods more than introverts; however, this assumes introverts aren't learning by observing.

  Student-centric learning does not have to come at the expense of an instructor's preferred teaching method. However, differentiated instruction demands that teachers finesse their style to accommodate the diverse needs of 21st-century classrooms.

138 TEACHING METHODS

1. Lecture by teacher (and what else can you do!)
2. Class discussion conducted by teacher (and what else!)
3. Recitation oral questions by teacher answered orally by students (then what!)
4. Discussion groups conducted by selected student chairpersons (yes, and what else!)
5. Lecture-demonstration by teacher (and then what 145 other techniques!)
6. Lecture-demonstration by another instructor(s) from a special field (guest speaker)
7. Presentation by a panel of instructors or students
8. Presentations by student panels from the class: class invited to participate
9. Student reports by individuals
10. Student-group reports by committees from the class
11. Debate (informal) on current issues by students from class
12. Class discussions conducted by a student or student committee
13. Forums
14. Bulletin boards
15. Small groups such as task oriented, discussion, Socratic
16. Choral speaking
17. Collecting
18. Textbook assignments
19. Reading assignments in journals, monographs, etc.
20. Reading assignments in supplementary books
21. Assignment to outline portions of the textbook

22. Assignment to outline certain supplementary readings
23. Debates (formal)
24. Crossword puzzles
25. Cooking foods of places studied
26. Construction of vocabulary lists
27. Vocabulary drills
28. Diaries
29. Dances of places or periods studied
30. Construction of summaries by students
31. Dressing dolls
32. Required term paper
33. Panel discussion
34. Biographical reports given by students
35. Reports on published research studies and experiments by students
36. Library research on topics or problems
37. Written book reports by students
38. Flags
39. Jigsaw puzzle maps
40. Hall of Fame by topic or era (military or political leaders, heroes)
41. Flannel boards
42. Use of pretest
43. Gaming and simulation
44. Flash cards
45. Flowcharts
46. Interviews
47. Maps, transparencies, globes
48. Mobiles
49. Audio-tutorial lessons (individualized instruction)
50. Models
51. Music
52. Field trips
53. Drama, role playing
54. Open textbook study
55. Committee projects–small groups
56. Notebook
57. Murals and montages
58. Class projects
59. Individual projects
60. Quizdown gaming
61. Modeling in various media
62. Pen pals
63. Photographs
64. Laboratory experiments performed by more than two students working together
65. Use of dramatization, skits, plays
66. Student construction of diagrams, charts, or graphs
67. Making of posters by students
68. Students drawing pictures or cartoons vividly portray principles or facts
69. Problem solving or case studies
70. Puppets
71. Use of chalkboard by instructor as aid in teaching
72. Use of diagrams, tables, graphs, and charts by instructor in teaching
73. Use of exhibits and displays by instructor
74. Reproductions

75. Construction of exhibits and displays by students
76. Use of slides
77. Use of filmstrips
78. Use of motion pictures, educational films, videotapes
79. Use of theater motion pictures
80. Use of recordings
81. Use of radio programs
82. Use of television
83. Role playing
84. Sand tables
85. School affiliations
86. Verbal illustrations: use of anecdotes and parables to illustrate
87. Service projects
88. Stamps, coins, and other hobbies
89. Use of community or local resources
90. Story telling
91. Surveys
92. Tutorial: students assigned to other students for assistance, peer teaching
93. Coaching: special assistance provided for students having difficulty in the course
94. Oral reports
95. Word association activity
96. Workbooks
97. Using case studies reported in literature to illustrate psychological principles and facts
98. Construction of scrapbooks
99. Applying simple statistical techniques to class data
100. Time lines
101. "Group dynamics" techniques
102. Units of instruction organized by topics
103. Non directive techniques applied to the classroom
104. Supervised study during class period
105. Use of sociometric text to make sociometric analysis of class
106. Use of technology and instructional resources
107. Open textbook tests, take home tests
108. Put idea into picture
109. Write a caption for chart, picture, or cartoon
110. Reading aloud
111. Differentiated assignment and homework
112. Telling about a trip
113. Mock convention
114. Filling out forms (income tax, checks)
115. Prepare editorial for school paper
116. Attend council meeting, school boar meeting
117. Exchanging "things"
118. Making announcements
119. Taking part (community elections)
120. Playing music from other countries or times
121. Studying local history
122. Compile list of older citizens as resource people Students from abroad (exchange students) Obtain free and low cost materials
123. Collect old magazines Collect colored slides
124. Visit an "ethnic" restaurant Specialize in one country
125. Follow a world leader (in the media) Visit an employment agency
126. Start a campaign Conduct a series Investigate a life Assist an immigrant
127. Volunteer (tutoring, hospital) Prepare an exhibit
128. Detect propaganda Join an organization
129. Collect money for a cause
130. Elect a "Hall of Fame" for males Elect a "Hall of Fame" for females Construct a salt map
131. Construct a drama

132. Prepare presentation for senior citizen group
133. Invite senior citizen(s) to present local history to class including displaying artifacts (clothing, tools, objects, etc.)
134. Prepare mock newspaper on specific topic or era
135. Draw a giant map on floor of classroom
136. Research local archaeological site
137. Exchange program with schools from different parts of the state
138. In brainstorming small group, students identify a list of techniques and strategies that best fit their class.

STEPS OF TEACHING

In order to make teaching an effective process one needs to follow certain steps. These steps are so important that these cannot be removed from the process of teaching. If a teacher deviates from these steps, the outcome of the teaching may be biased.

a. **Planning** Without a plan one cannot proceed in a resolution. In the teaching-learning process also a teacher has to make a plan according to the strength of the students, the locality of the school the environmental conditions of the school and the contents and the subjects he is going to teach. He has to take into consideration the language that he finds suitable for teaching. The planning includes the gradation of students, as to how many are present in the class, how many are absent, how many are high achieving and how many mediocre. The teacher has to plan for the arrangement of teaching aids like maps, charts, models, overhead projector etc.

b. **Preparation** During the preparation stage, the teacher has to follow the subject or topic systematically. As the present times are times of science and technology, the presentation must also be scientific in nature for which the teacher may need overhead projectors, slides TV and video tapes etc. for making his presentation more effective and understandable.

c. **Presentation**: After preparation, the teacher is prepared to present the topic in the class to the full satisfaction of students and the observer who is there to watch his presentation.

d. Comparison Comparison is an important characteristic of teaching. It allows a second chance, to all the three participants, the teacher, the learner and the observer to arrange one more programme of teaching-learning in order to remove, any shortcomings found in the first attempt.

Seven Steps for Teaching and Learning

1. Diagnose the needs of student and create appropriate classroom profile summary power standards multiple intelligence's formative assessment strategies instructional strategies
2. Create and maintain classroom profiles to record data identifying the standards, formative assessment date(s), summative assessment date(s), and student information reflecting performance on standards
3. Plan engaging lessons three-part lesson (opening, work period, and closing) essential question(s) engaging instructional activities based upon the identified power standards and depth of knowledge
4. Teach the standards using standards-based instruction and ensure the identified instructional activities at the appropriate depth of knowledge level
5. Utilize formative assessment strategies to daily determine if standards taught were mastered and update the classroom profile daily
6. Re-teach, provide additional support, and document response to intervention (RTI) for students who have not mastered the standard(s)
7. Administer a summative assessment to validate that students have mastered the standards and update the classroom profile record.
8. Repeat step two and/or three and follow the process until all power standards have been taught and mastered by all students.

PREVIOUS YEARS MCQs

1. A good teacher is one who can
(a) Make difficult subject matter easy for students.
(b)Teach sociology and philosophy
(c) Say that I do not know everything
(d) Keep on updating his information
Ans (a)

2. Which of the following is odd statement?
(a) Majority of the teachers use lecture method
(b) Most of the class rooms are poorly equipped.
(c) Knowledge is static
(d) One way interaction prevails in class rooms.
Ans (c)

3. Which of the following statement is right?
(a) Teacher can be assisted by computer aided instruction.
(b) Teacher can be replaced by computer aided instruction.
(c) Face to face teaching and on time teaching are equally effective.
(d) On line teaching is more effective.
Ans (a)

4. By which of the following groups of subjects can a teacher develop better teaching method?
(a) Sociology and philosophy
(b) Philosophy and psychology
(c) Psychology and sociology
(d) None of the above
Ans (b)

5.The function of the school as an agent of society is
(a) to make children vocationally competent.
(b) to make the children understand environment
(c) to prepare child for life.
(d) to teach the children to read and write only.
Ans (c)

6. The term "gang" according to education represents
(a) male group only
(b) female group only
(c) social phenomena
(d) terrorists
Ans (c)

7. According to Plato the main aim of education is to
(a) develop the power of contemplation
(b) train each person in vocation
(c) cultivate personality
(d) strengthen the power of perception
Ans (a)

8. While helping the children to make educational plans it is unfair for them to
(a) select all subjects from one particular field
(b) plan the programmes ahead
(c) Choose a subject of lesser interest.
(d) Take typing with college preparatory subjects.
Ans (a)

9. Education officers often speak of the tome of an institution.This concept of 'tone' refers to
(a) the disciplinary measures adopted by an institution for avoiding classes.
(b) the organizational and supervising set up the institution.
(c) the healthy atmosphere of the institution from the sentimental point of view.
(d) the programs and activities planned by the institution.
Ans (c)

10. In the words of Mahatma Gandhi himself,basic education is

(a) a struggle for freedom to be inculcated in children
(b) educating through crafts, throughout.
(c) training and observation by teachers
(d) Education through crafts is creative for children

Ans (d)

11. Micro teaching is useful to students of

(a) junior classes only.
(b) primary classes only

Ans (b)

12. Majority of students in a large class are found dozing.There may be something wrong with

(a) the teaching process
(b) the time of instruction
(c) the students concerned
(d) the content taught.

Ans (c)

13. As one of the methods of teaching the teachers are recommended to adapt the problem method. The precaution to be observed in this method is to see that

(a) the problem starts with some life experience of the pupil.
(b) Problems are suggested by teachers at the end of the lesson.
(c) the problem starts with a school subject itself.
(d) the problem is of the teacher and not of the pupil.

Ans (c)

14. Knowledge of psychology is must for a educational philosopher,because

(a) psychology acquaints the philosopher with the world of reality in his theorizing.
(b) psychology principles arise out of philosophical maxims.
(c) the questions of 'why and 'what' in philosophy is purely psychological at the root.
(d) psychology is after all a branch of philosophy.

Ans (b)

15. Regarding the teacher's control in the education of children,the following is the main difference between the Herbert and Dewey

(a) Dewey favours teacher control, but Herbert is against it.
(b) Herbert is in favour of teacher control while Dewey cannot agree with him.
(c) Herbert favour normal steps,but Dewey gives more importance to teacher control only.
(d) Both are in favour of imparting knowledge through teacher control.

Ans (b)

16. If a teacher had to establish his credibility in evaluating answer sheets he must be

(a) strict
(b) lenient
(c) objective
(d) prompt

Ans. C)

17. Mainstreaming is a term associated with:

(a) career education
(b) education for handicapped
(c) inter-age class groupings
(d) environmental education

Ans (b)

18.Suggestion helps in the development of information moral behavior, aesthetic sense and character traits. Which of the following is the chief source of suggestions which would his life?

(a) Pupil of same age
(b) Teachers
(c) Elders
(d) None of these

Ans (c)

19.Of the following learning theories, the one that embodies the idea that the learning takes place through insight is known as

(a) Gestalt

(b) Stimulus-Response
(c) Connectionist
(d) Pragmatic

Ans (a)

20. The teacher ought to know the problems prevalent in the field of education. The reason is that

(a) only a teacher can do something about solving them.
(b) he can tell about the same to another teacher.
(c) Teachers can tell the government about it.
(d) With this knowledge, the teacher can have information about education.

Ans: (a)

21. With respect to the development of skills, all of the following are correct except that

(a) Pupil of same mental age should learn at the same rate.
(b) Group interaction increases the skills
(c) group instruction facilitates the learning process
(d) workbooks can be invaluable learning aid.

Ans (a)

22. The project method of teaching is best associated with the philosophy of

(a) John Dewey
(b) Max rafferty
(c) Robert Hatchins
(d) B.F. Skinner

Ans (a)

23. In our present society where values are deteriorating, the excellent education will be which

(a) Enables one to earn in an easy manner.
(b) Exaggerates the competition in the society.
(c) Works for establishment of human and cultural value.
(d) Decelerates the social change in society.

Ans (c)

24. Emotional development is as much affected by maturation and learning as sensory processes, muscular growth and intellectual functions. Parlous experiment showed emotional responses could be learned through

(a) conditioning
(b) imitation
(c) knowledge and skills.
(d) None of these

Ans (a)

25. Which of the following statement is correct?

(a) In research, objectives can be worded in question form.
(b) In research, objectives can be worded in statement form.
(c) Objectives are to be stated in Chapter I of the Thesis
(d) All of the above

Ans (d)

26. On which of the following statements there is consensus among educators?

(a) Disciplinary cases should be sent to the principal only when other means have failed.
(b) Disciplinary cases should never be sent to principal's office.
(c) Disciplinary cases should be totally neglected in the class.
(d) None of these

Ans (a)

27. Kindergarten (KG)system of education is indebted to

(a) Dewey
(b) Froebel
(c) Plato
(d) Spencer

Ans (b)

28. Micro teaching is most effective for the student-teacher :

(a) during the practice-teaching

(b) after the practice- teaching
(c) before the practice-teaching
(d) None of these
Ans (b)

29. Teaching model is a way to
(a) Teach in a formal as well as informal way.
(b) Select such stimulus so that, the students may give expected feedback.
(c) Talk and think about instruction, which may contain facts in organized and classified manner.
(d) both (a) and (b)
Ans (d)

30. The functions of a teacher are in the order of
(a) guiding the child, helping him towards progress and evaluation
(b) checking homework, guiding him and assigning further task
(c) Both of these
(d) None of the above
Ans (a)

31. Maximum participation of students is possible in teaching through
(a) lecture method
(b) discussion method
(c) audio-visual aids
(d) textbook method
Ans (b)

32. Teachers' primary responsibility lies in
(a)planning educational experiences
(b)keeping students records
(c) implementing policies
(d) all of the above
Ans (a)

33. A teacher in the class is
(a) a director of the group
(b) the president of the group
(c) a leader and guide of the group
(d) all of the above
Ans (c)

34. As a teacher you are going to show historical places of a city to your students. Father of a student does not send his child with you. In this situation, you would
(a) leave this child and would go with others
(b) try to know why his father was hesitant to send his child.
(c) convince his father by telling the importance of such educational and cultural trips
(d) none of the above.
Ans (c)

35. All of the following are the characteristic features of an effective teacher except
(a) emphasizing group discussion for the purpose of clarifying the objectives
(b) emphasis upon standard
(c) emphasis upon the quick control of the problematic situation
(d) differential treatment meted out to students of his class
Ans (d)

36. In our present society, where values are deteriorating, the excellent education will be which
(a) enables one to earn in an easy manner
(b) Exaggerates the competition in the society.
(c) works for re-establishment of human and cultural values.
(d) deaccelerates the social-change in the society.
Ans (c)

37. While teaching in the class one of your students pointed out sharply your mistakes.
What will you do in such a condition?
(a) You leave the class for the day.

(b) You scold the child and angrily resist him.
(c) You feel sorry for committing a blunder.
(d) You will not show any emotion.

Ans (c)

38. A teacher of high caste is biased with the low caste's students. What advice you would like to give to the teacher?

(a) Rebuke him for narrow thinking.
(b) His attitude is all right.
(c) Threat him against the constitutional provisions.
(d) He should not behave against the national spirit and need of the hour.

Ans (d)

39. One of your colleagues is living in your locality but you have no affinity with him, the reason may be

(a) his selfishness
(b) his religious faith
(c) his social rejection
(d) his miserable behaviour and rural background.

Ans (a)

40. If a girl student is attracted towards you beyond the ethical limits then how would you control your own emotions?

a) You will try to calm down her emotions, as she is passing through the adolescent stage.
(b) You will take advantage of the situation and will exploit her.
(c) You will like to repress her intentions through strict measures.
(d) You will communicate this matter to her parents for help.

Ans (a)

41. While delivering lecture if there is some disturbance in the class, then a teacher should

(a) keep quiet for a while and then go on
(b) punish those causing disturbance
(c) not bother of what is happening in the class
(d) all of the above

Ans (a)

42. If a group of students enter your room and abuse you and behave violently with you, at that time how you would control your emotions?

(a) You will feel ashamed among your teaching community.
(b) You will react in similar tone and try to assault them physically.
(c) First you will try to pacify their emotions, and then ask politely afxmt their behavior.
(d) You will report the case to the principal with recommendation of punitive measures.

Ans (c)

43. The main role of education according to Plato was

(a) to develop the power of contemplation
(b) to strengthen the state
(c) to develop the personality of each individual
(d) All of the above

Ans (b)

44. Suppose you are asked by your friends to take the membership of the teachers union. How could you take decision in this situation?

(a) You will de-affiliate yourself from the colleagues instead of hostility with the management.
(b) You will have faith in unity so you will accept the membership.
(c) You will give priority to social relations; therefore, you will accept the offer.
(d) You will try to avoid the issue.

Ans (b)

45. John Locke's phrase of tabula rasa means

(a) free education
(b) Tal and Ras
(c) mind itself is a result of the process of evolution
(d) All of the above

Ans (c)

46. You are in class on the very first day of the opening session, and take introductions of the students, the primary objective of this introduction for you is

(a) to know about students' potentialities along with their family status
(b) Selection of those students who can do the school job for you.
(c) identification of potential
(d) both(b)&(c)

Ans (c)

47. Kindergarten (KG) system of education means garden of small kids which is indebted to

(a) Plato
(b) Froebel
(c) Dewey
(d) Spencer

Ans. (b)

48. The major responsibility with which the school personnel have been entrusted is that

(a) it harmonizes the needs of the child and demands of the society for the benefit of both
(b) it prepares the school programme according to the need of the child
(c) it makes the child able to get job
(d) all of the above

Ans (a)

49. The most appropriate meaning of learning is

(a) personal adjustment
(b) modification of behavior
(c) inculcation of knowledge
(d) acquisition of skills

Ans (b)

50. A democratic society is one which

(a) respects the enlightened individuals X
(b) follows the principles of equality, freedom, fraternity and justice
(c) believes in equal educational opportunity
(d) All of the above

Ans (d)

51. The introduction of career courses in schools and colleges aims at

(a) developing the ability to make the intelligent choice of jobs
(b) providing professional knowledge to students
(c) increasing G.K. in students
(d) All of the above

Ans (a)

52. If some of your pupils misbehave with you in the college campus you must

(a) report to their parents
(b) report to the principal
(c) improve their behaviour by your own character and scholarship
(d) mobilize other teachers against these guys

Ans (c)

53. The education aims at the fullest realization of all the potentialities of children. It implies that

(a) They should provide suitable opportunities and favorable environmental facilities which are conducive to the maximum growth of children.
(b) Teachers and parents must know what children are capable of and what potentialities they possess.
(c) It is necessary that their attitudes are helpful, encouraging and sympathetic.
(d) All of the above

Ans (a)

54. The greatest important cause of failure in beginning for a teacher lies in the area of

(a) Inter-personal relationship
(b) Knowledge of the teacher
(c) verbal ability
(d) tight handling of the students

Ans (a)

55. How will you demonstrate your impartial behaviour ?

(a) By maintaining high self-esteem and egoistic behavior.
(b) By making own behaviour more balanced and fair.
(c) By assaulting the teacher.
(d) By criticizing the teaching community.
Ans (b)

56. A teacher in the class should keep the pitch of his voice
(a) high enough
(b) moderate
(c) low
(d) sometime low and sometime high
Ans (b)

57. An effective teaching means all of the following except
(a) a teacher teaches with enthusiasm
(b) a teacher finds fault in his students
(c) a teacher is interested in making the subject matter understood rather than on completing the course.
(d) a teacher puts emphasis more on teaching than on class control.
Ans (b)

58. Which of the following is the most important single factor in underlying the success of beginning a teacher?
(a) communicative ability
(b) scholarship
(c) personality and its ability to relate to the class and to the pupils
(d) organizational ability
Ans (c)

59. You have children. You are a teacher. How would you like to behave with your students in comparison to your children?
(a) Just like own children
(b) (b)Repressed treatment
(c) Equal treatment is not possible to all the students.
(d) It is better to lend them a free hand
Ans (a)

60. Some of your colleagues are busy in cracking filthy jokes during their leisure in college. You are also a member of that group but unable to stop them. What would you do to avoid it?
(a) You advice your colleagues to mind their languages while cracking jokes in college
(b) You persuade them not to waste their leisure time in filthy jokes.
(c) You change the groups or live in isolation because you don't relish it.
(d) You remind them of their noble profession.
Ans (b)

61. The best educational programme is one which is according to the
(a) ability of the child
(b) need of the child
Ans (b)

62. The male students of your class are annoyed I with you on the pretext you have been easily approached by the girl students and do a favour to them (girls). In such an embarrassing situation how would you like to control them in the class?
(a) You will tell the male students that girls have no option except to depend on the school teacher for their academic assistance.
(b) You will justify that most of the female students are more sincere towards their studies than male students.
(c) You will communicate to the male stu¬dents that it is difficult for you refuse the request made by female students.
(d) None of the above.
Ans (b)

63. While dealing with juvenile delinquents a teacher should
(a) play them with filthy sex jokes
(b) talk with them frankly and guide and channelize their potentialities in constructive ways
(c) (c)complain to the principal against them
(d) none of the above
Ans (b)

64. An effective teacher adopts the norms of the
(a)democratic society

(b)autocratic society
(c)laizzes faire society
(d)all of the above according to the situation.
Ans (a)

65. A mentally retarded student attends your lecture and sits in a deaf and dumb manner.
What will you do?
(a)Make your lecture very simple and spare some extra time for him.
(b)You pressurise the student to leave the class
(c) You do not like to spoil majority for the individual.
(d) You do not support him at all.
Ans (a)

67. A teacher is expected to do all except
(a) Help pupils to solve their problems
(b) Participation in community activities
(c) Taking interest in politics
(d) Sponsor clubs and other school affairs.
Ans (c)

68. In order to develop rapport with your pupils you should
(a) Behave them in a democratic way
(b) Guide them
(c) Have communicative ability
(d) all of the above
Ans (b)

69. The students who keep on asking questions in the class
(a) should be encouraged to find answers independently
(b) Should be encouraged to participate in the classroom discussion.
(c) Should be advised to meet the teacher after the class.
(d) Should be encouraged to continue questioning.
Ans (b)

70. Use of telecast materials
(a) Enhances concentration and learning
(b) Increases retention power
(c) Reduces the burden of the teacher
(d) all of the above
Ans (d)

71. Teachers who are enthusiastic in the class- room teaching
(a) simply dramatize to hold the student's attention
(b) Often lack proficiency in the subjects which stays hidden under their enthusiasm.
(c) (c)involve their students in the teaching learning process
(d) All of the above
Ans (c)

72. A teacher who is not able to draw the attention of his students should
(a) Evaluate his teaching method and improve it
(b) Find fault in his pupils
(c) Resign from the post
(d) Start dictating
Ans (a)

73. Democracy in the class-room is best reflected through
(a) Allowing student's freedom to the observance of classroom rules and regulations.
(b) Allowing the class to decide the auricular experiences of the classroom
(c) Allowing the maximum participation of all the students in class-room activities.
(d) None of above.
Ans (c)

74. If majority of students in your class are weak you should
(a) keep your speed of teaching fast so that students comprehension level may increase
(b) not care about the intelligent students
(c) keep your teaching slow
(d) keep your teaching slow along with some extra guidance to bright pupils
Ans (d)

75. If some students fail in the examination it is the fault of

(a) the principal
(b) the teacher
(c) pupils themselves
(d) text books

Ans (c)

76. If a teacher requests you to do a favor in a female student's evaluation, what would you like to do in this situation?

(a) You will teach him a moral lesson against injustice.
(b) You will remind him about the morality of being a teacher.
(c) You will evaluate the answer book honestly and award marks accordingly.
(d) None of the above.

Ans (c)

77. If a principal of your college, charges you with the act of negligence of duties, how would you behave with him ?

(a) You would take revenge by giving physical and mental agony to him
(b) You would neglect him
(c) You would take a tough stand against the charges

UNIT – 2

RESEARCH APTITUDE

UNIT 2: RESEARCH APTITUDE

CONTENTS:

- Research: Meaning, characteristics and types:
- Steps in Research
- Methods of Research
- Research Ethics
- Paper, article, workshop, seminar, conference and symposium
- Thesis writing: its characteristics and format

MEANING OF RESEARCH

First, we should start from the word 'research'. This word is made up by adding 'Re' as a prefix to the word 'search'. Search is to make known of an existent unknown thing. Therefore, research (search of searched) means to elicit some facts out of a known thing. Research in common parlance refers to a search for knowledge

Every letter of the word 'research' emphasizes a special and dignified meaning as given below. R – Rational (way of thinking)
E – Expert/Exhaustive (Treatment) S – Search (for solution)
E – Exactness
A – Analytical Analysis (of adequate data) R – Relationship (of facts)
C – Careful (recording)/ critical (observation) / constructive (attitude) / condensed/and compactly (stated Generalization)
H – Honesty/Hard work

Research is thus, an original contribution to the existing stock of knowledge making for its advancement. It is the pursuit of truth with the help of study, observation, comparison and experiment. In short, the search for knowledge through objective and systematic method of finding solution to a problem in research.

We can summarize the modern meaning of research in following points-Research is

"Research comprises defining and redefining problems, formulating hypothesis or suggested, solutions, collecting, organizing and evaluating data, making deductions and reaching conclusions and at last carefully listing the conclusions to determine whether they fit the formulating hypothesis."

-Clifford Woody

"Research is the systematic and objective analysis and recording of controlled observations that may leave to development of generalizations, principles or theories result in prediction and possibly ultimate control of events."

-John W.Best

CHARACTERISTICS OF RESEARCH

1. It is a scientific investigation. Research (re-search) means to "search again.' It connotes patient study and scientific investigation.
2. It develops concepts and the theories. One reason for conducting research is to develop and evaluate concepts and the theories.
3. It is solution oriented and directed towards the solution of a problem.
4. It determines the relation between two or more variables.
5. Research emphasizes to the development of theories, concept, principles and generalization that are helpful in predicting future occurrences.
6. Research is replicable. The design, procedures and result of scientific research should be replicable so that any person other than researcher may assess the validity of research.
7. Research requires that researchers have full knowledge of the problem under the study.

AIMS AND OBJECTIVES OF RESEARCH

To discover answers to questions through the application of scientific procedures, its main aim is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:

1. To gain familiarity with a phenomenon or to achieve new insights into it. (Exploratory or formulative research studies).
2. To portray accurately the characteristics of a particular individual, situation or a group. (Descriptive research studies).
3. To determine the frequency with which something occurs or with which it is associated with something else. (Diagnostic research studies).
4. To test a hypothesis of a causal relationship between variables (hypothesis-testing research studies).

TYPES OF RESEARCH

a) Fundamental Research/Pure Research/Basic Research:

- It is undertaken for the sake of knowledge without any intension to apply it in practice.
- This research helps in developing theories by discovering broad generalization and principles.
- It is organized through different procedures of research like sampling, hypothesizing facts, etc. It can be experimented in a psychological laboratory.
- Research concerning some natural phenomenon or relating to pure mathematics, research studies concerning human behavior carried on with a view to make generalizations about human behavior are examples of fundamental research.

b) Applied

- Aims at finding a solution for an immediate problem facing a society or an industrial/business organization.
- Solve practical problem of the modern world, rather than to acquire knowledge for knowledge sake.
- Marketing research is an example of applied research.

c) Exploratory Research

- It is a preliminary study of an unfamiliar problem about which researcher has little or no knowledge.
- The objective of exploratory research is the development of hypothesis rather than their testing.

d) Action Research

- Its aim is immediate application but not any development of theory.
- It is research either initiated to solve the immediate problem or if the researcher finds any problem during the course of his field investigation and observation he applies it.

(e) Descriptive study

- Includes surveys and fact findings enquiries of different kinds.
- The major purpose of descriptive research is description of the state of affairs, as it exists at present.
- In social science and business research the term often used is ex-post fact research.
- The researcher has no control over the variables, he can only report what has happened or what is happening.

(f) Evaluation Study

- It is a type of applied research.
- It is made for assessing and taking stock of effectiveness of social or economic programmes.
- For example: Family planning scheme, Irrigation project.

(g) Diagnostic Study

- Similar to descriptive study but with a different focus, which is directed towards discovering what is happening? Why is it happening and what can be done about it?
- It aims at identifying the causes of problems and possible solutions for it.

Difference between Research methods and Research methodology

Sr. No.	Research Methods	Research Methodology
1.	Tools, techniques or processes that are used for conduction of research.	The principles that guide our research practices.
2.	Aims at finding solutions t research › problems.	Research methodology aims at the employment of the correct procedures to find out solutions.

Difference between Experimental and Non-Experimental Research

Experimental Research	Non- Experimental Research
1. This type of research always begins with some hypothesis which the research wants to test.	In this type of research it is not essential to always have hypothesis. All exploratory researcher and many descriptive researcher do not have any hypothesis.
2. Data generated by this research are used to establish cause and effect relationship between two variables. On the basis of these data one can predict changes in the independent variable.	Data generated by this type of research are not helpful in establishing the cause and effect relationships between variables. They can be used only to describe certain relationships without interdependence.

(1) Descriptive vs. Analytical Research

The fact finding inquiries and the field surveys are main contents of descriptive research. The major purpose of descriptive research is description of the state of affairs as it exists at present. In social science and business research we quite often use the term ***Ex post facto research*** for descriptive research studies. The main characteristic of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening. Most ***ex post facto research*** projects are used for descriptive studies in which the researcher seeks to measure such items as, for example, frequency of shopping, preferences of people, or similar data. ***Ex post facto studies*** also include attempts by researchers to discover causes even when they cannot control the variables. The methods of research utilized in descriptive research are survey methods of all kinds, including comparative and correlation methods. In analytical research, on the other hand, the researcher has to use facts or information already available, and analyze these to make a critical evaluation of the material.

(2) Applied vs Fundamental

Applied and fundamental are the two faces of research. Applied research aims at finding a solution for an immediate problem facing a society or an industrial/business organization, whereas fundamental research is mainly concerned with generalizations and with the formulation of a theory. "Gathering knowledge for knowledge's sake" is termed 'pure' or 'basic' research. Research concerning some natural phenomenon or relating to pure mathematics are examples of fundamental research. Similarly, research studies, concerning human behavior carried on with a view to make generalizations about human behaviour,

are also examples of fundamental research, but research aimed at certain conclusions (say, a solution) facing a concrete social or business problem is an example of applied research. Research to identify social, economic or political trends that may affect a particular institution or the copy research to find out whether certain communications will be read and understood or the marketing research or evaluation research is examples of applied research. Thus, the central aim of applied research is to discover a solution for some pressing practical problem, whereas basic research is directed towards finding information that has a broad base of application and thus, adds to the already existing organized body of scientific knowledge.

Sr. No.	Pure Research	Applied Research
1.	Studies a problem usually from the focus of one discipline.	Several disciplines collaborate for solving the problem.
2.	Aims to illuminate the theory by enriching the basic of a discipline.	Aims to solve a problem by enriching the field of application of a discipline.
3.	Seeks generalizations	Often studies individual cases without the objective to generalize
4.	Studies why things happen	Studies how things can be changed
5.	Reports is in technical language	Report is in common language
6.	Works on hypotheses that variables not measured remains constant.	Recognizes that other variables are constant by changing.

(3) Quantitative vs Qualitative

Measurement of quantity is followed by quantitative research. It is applicable to phenomena that can be expressed in terms of quantity. Qualitative research, on the other hand, is concerned with qualitative phenomenon, ***i.e.,*** phenomena relating to or involving quality or kind. For instance, when we are interested in investigating the reasons for human behavior ***(i.e.,*** why people think or do certain things), we quite often talk of 'Motivation Research', an important type of qualitative research. This type of research aims at discovering the underlying motives and desires, using in depth interviews for the purpose. Other techniques of such research are word association tests, sentence completion tests, story completion tests and similar other projective techniques. Attitude or opinion research ***i.e.,*** research designed to find out how people feel or what they think about a particular subject or institution is also qualitative research. Qualitative research is especially important in the behavioral sciences where the aim is to discover the underlying motives of human behavior.

(4) Conceptual vs Empirical

The research, which is based on some ideas on theory, is known as conceptual research. It is generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones. On the other hand, empirical research relies on experience or observation alone, often without due regard for system and theory. It is data-based research, coming up with conclusions which are capable research. In such a research it is necessary to get at facts first hand, at their source, and actively to go about doing certain things to stimulate the production of desired information.

There are many other kinds of research which are variations of one or more of the above stated approaches, based on either the purpose of research, or the time required to accomplish research, or the environment in which research is done, or on the basis or some other similar factor. From the point of view of time, we can think or research either as one-time research or longitudinal research. In the former case the research is confined to a single time-period, whereas in the latter case the research is carried on over several time-periods. Research can be field- setting research or laboratory research or simulation research, depending upon the environment in which it is to be carried out. Research can as well be understood as clinical or diagnostic research. Such research follows case-study methods or in-depth approaches to reach the basic casual relations. Such studies usually go deep into the causes of things or events that interest us, using very small samples and very deep probing data gathering devices. The research may be exploratory or it may be formalized. The objective of exploratory research is the development of hypothesis rather than their testing, whereas formalized research studies are those with substantial structure and with specific hypothesis to be tested. Historical research is that which utilizes historical sources like documents, remains, etc. to study events or ideas of the past, including the philosophy or persons and groups at any remote point of time. Research can also be classified as problem oriented research, a researcher is free to pick up a problem, redesign the enquiry as he proceeds and is prepared to conceptualize as he wishes. Decision-oriented research is always for the need of a decision maker and the researcher in this case is not free to embark upon research according to his own inclination. Operations research is an example of decision oriented research since it is a scientific method of providing executive departments with a quantitative basis for decisions regarding operations under their control.

STEPS OF RESEARCH

The following order concerning various steps provide a useful procedural guideline regarding research process :

1. Formulation of Research Problem
2. Literature Survey
3. Developing Hypothesis
4. Preparing Research Design

5. Determining Sample Design
6. Collection of Data
7. Execution of Project
8. Analysis of data
9. Hypothesis Testing
10. Generalization and Interpretation
11. Preparation of Report

1. Formulation of Research Problem

Formulation of the problem means defining the problem precisely. In other words a problem well defined is half solved.
There are two types of research problems:

1. Those which relate to states of nature
2. Those which relate to relationships between variables

The research must first decide the general area of interest or aspect of a subject matter that he would like o inquire into. Essentially two steps are involved in formulating the research problem:

i. *Understanding the problem thoroughly*

ii. *Rephrasing the same into meaningful terms from an analytical point of view.*

The best way of understanding the problem is to discuss it with one's own colleagues or with those having some expertise in the matter. In academic institution the researcher can seek the help from guide who is usually an experienced man and has several research problems in mind. In private business units or government organizations, the problem is usually earmarked by the administrative agencies with which the researcher can discuss as to how the problem originally came about and what considerations are involved in its possible solutions.
The researcher must at the same time study all available literature to get himself familiar with the selected problem.

2. Extensive Literature Review

Once the problem is formulated a brief summary of it should be written down. At this stage the researcher should undertake extensive literature survey connected to the problem. Academic journals, conference proceedings, government reports, books etc. must be monitored depending upon the nature of the problem. The earlier studies which are similar to the study in hand should be carefully studied.

3. Development of Hypothesis

A hypothesis is a tentative assumption which a researcher wants to test for its logical or empirical consequences. Hypotheses should be stated in precise and clearly defined terms.
The role of hypothesis is to guide the researcher by delimiting the area of research and to keep him on the right track. It also indicates the type of data required and the type of methods of data analysis to be used. It may be mentioned that though a hypothesis is useful it is not always necessary, especially in case of exploratory researches. However, in a problem oriented research, it is necessary to formulate a hypothesis.

4. Preparing a Research Design

Research design is the conceptual structure within which research is conducted. It is the blueprint for the collection, measurement and analysis of data. Decision regarding what, where,when, how much, by what means concerning an inquiry or a research study constitute a research design. In other words the function of research design is to provide for the collection of relevant evidence with minimal expenditure of effort, time and money. The following decisions are made in Research design:

i. What is the study about?
ii. Where will study be carried out?
iii. Why is the study being carried out?
iv. What type of data is required?
v. Where can data be found?
vi. What will be the sample design?
vii. What data collection techniques will be used?
viii. How much time will study take?

5. Determining Sample Design

All the items under consideration is any field of inquiry constitute 'universe' or 'population'. A sample design is a definite plan determined before any data are actually collected for obtaining a sample from a given population. Thus a plan to select 20 of a city's 100 hospitals in a certain way constitutes a sample design. The sampling design can be classified into probability sampling plans and non-probability sampling plans. Different Sampling designs in each of these categories are listed as follows:

Probability Sampling Plan

1. Simple Random Sampling
2. Systematic Sampling
3. Stratified Random Sampling
4. Cluster Sampling
5. Multistage Sampling

Non-probability sampling plan

1. Convenience Sampling
2. Judgement Sampling
3. Quota Sampling
4. Snowball Sampling

Depending on the population size, required precision and available time to carry out the research project, a suitable sampling plan is to be selected.

6. Collecting the data

Data are the basic input to any decision making process. The processing of data gives statistics of importance of the study. Data can be classified into :

i. Primary Data

ii. Secondary Data

Primary data can be collected either through experiment or through survey whereas **secondary data** is the data which has already been collected by others. This data is primary data for the agency that collects it and becomes secondary data for someone else who uses this data for his own purposes. The different methods used for primary data collection are observation method, personal interview, telephone interview and mail survey. The secondary data can be obtained from journals,books,magazines,newspapers, reports, government publications, publication of professional and research organizations and so on. The researcher should select one of these methods of collecting the data taking into consideration the nature of investigation, objective and scope of the inquiry, financial resources, available time and the desired degree of accuracy.

7. Execution of the project

Execution of the project is very important step in the research process. The researcher should see that the project is executed in a systematic manner an in time. If the survey to be conducted by means of structured questionnaires, data can be readily machine-processed. If the data are to be collected through interviews, arrangements should be made for proper selection and training of the interviewers. Steps should be taken to ensure that the survey is under statistical control so that the collected information is in accordance with the pre-defined standard of accuracy.

8. Analysis of Data

After data are collected, proper tools and techniques should be used for classification and analysis of data. The analysis of data requires a number of closely related operations such as establishment of categories, the application of these categories to raw data through coding, tabulation and then drawing statistical inferences. The tools of classification of data are frequency distribution, cumulative frequency distribution, relative frequency distribution and charts. Different types of charts are pie chart, bar chart, stacked bar chart, histogram, frequency polygon and ogive curves.

9. Hypothesis Testing

After analysis the data as stated above, the researcher is in a position to test the hypothesis, if formulated earlier. Hypothesis testing is done to know whether the facts support the hypothesis or they happen to be contrary. Various tests, such as CHI square test, t- test, F- test, have been developed by statisticians for this purpose. One or more such tests scan be used for hypothesis testing.

10. Generalization and Interpretation

If the hypothesis is tested and upheld several times, it may be possible for the researcher to arrive at generalization i.e. to build a theory. As a matter of fact, the real value of research lies in its ability to arrive at certain generalizations. If the researcher had no hypothesis to start with, he might seek to explain his findings on the basis of some theory. It is known as interpretation. The process of interpretation may quite often trigger off new questions which in turn may lead to further researches.

11. Preparation of the report or the thesis

Finally, the researcher has to prepare the report of what has been done by him. Writing of report must be done with great care. The layout of the report should be as follows :

i. Preliminary pages

Preliminary pages contain title and date followed by acknowledgements and foreword. Then there should be table of contents followed by a list of tables and list of graphs and charts, if any, given in the report.

ii. Main text

Main text of the report should have the following parts:

a) Introduction

It should contain a clear statement of the objective of the research and an explanation of the methodology adopted in accomplishing the research. The scope of the study along with various limitations should as well be stated in this part.

b) ***Summary of the findings*** After introduction there would appear a statement of findings and recommendations in non technical language. If the findings are extensive, they should be summarized.

c) Main Report

The main body of the report should be presented in logical sequence and broken down into readily identifiable sections.

d) Conclusion

Towards the end of the main text, researcher should again put down the results of his research clearly and precisely. It is the final summing up.

iii. End matter

At the end of the report, appendices should be enlisted in respect of all technical data. Bibliography, i.e. list of books, journals, reports etc. consulted, should also be given in the end. Index should also be given specially in a published research report. The report should be written in a concise and objective style in simple language avoiding vague expressions such as 'it seems' or 'there may be'. Charts and illustration in the main report should be used only if they present the information more clearly and forcibly.

METHODS OF RESEARCH

The aim of science is to provide new and useful information in the form of verifiable data: obtained under conditions such that other qualified people can make similar observations and obtain the same results. This task calls for orderliness and precision in uncovering relationships and in communicating them to others.

1. Experimental Method

An experiment is a test, a procedure used to find out something not presently known. Experiments are usually carried out in order to discover the cause of a phenomenon. The experimental method is a matter of logic, not of location. Even so, most experimentation takes place in special laboratories, chiefly because the control of conditions commonly requires special equipment that is best housed and used in one place. The laboratory is generally located in a university or a research institute of some kind, where it is accessible to scientists who work on a variety of topics.

i. Laboratory

The distinguishing characteristic of a laboratory is that is a place where the experimenter can carefully control conditions and take measurements in order to discover orderly relationships among variables. A variable is something that can occur with different values. For example, in an experiment seeking to discover the relationship between learning ability and age, both learning ability and age can have different values, learning being either slow or fast and the learner being either young or old. To the extent that learning ability changes systematically with increasing age, we can discover an orderly relationship between them.

ii. Variables

The ability to exercise practice control over variables distinguishes the experimental method from other methods of observation. If the experimenter seeks to discover whether learning ability depends on the amount of sleep a person has had, he can control the amount of sleep by arranging to have several groups of subjects spend the night in the laboratory. One group might be allowed to go sleep at 11:00 P.M., another at 1.00 A.M., and the third group might be kept awake until 4:00 A.M. By waking all the subjects at the same time and giving each the same learning task, the experimenter can determine whether the subjects with more sleep master the task more quickly than those with less sleep.

In this study, the different amounts of sleep are the antecedent conditions, the learning performances are the results of these conditions. We call the antecedent condition the independent variable because it is independent of what the subject does. The variable affected by changes in the antecedent conditions is called the dependent variable; in psychological research the dependent variable is usually some measure of the subject's behavior. The phrase "is a function of" is used to express the dependency of one variable on another. Thus, for the experiment above, we could say the subject's ability to master a task is a function of the amount of sleep he has had.

iii. Degree of Control

The degree of control possible in the laboratory makes a laboratory experiment the preferred scientific method when it can be used appropriately. Precision instruments are usually necessary in order to control stimuli and to obtain exact data. The experimenter may need to produce colours of known wavelengths in vision studies, or sounds of known frequency in audition studies. It may be necessary to expose a pattern in an aperture of a viewing screen for a fraction of a second. With precision instruments, time can be measured in thousandths of a second, and physiological activity can be studied by means of very slight electrical currents amplified from the brain. Thus, the psychological laboratory has audiometers, photometers, oscilloscopes, electronic timers, electroencephalographs, and computers.

iv. Value of an Experiment

The value of an experiment is not determined, however, by the amount of apparatus used. If the logic of experimentation requires precision apparatus, then such apparatus should be used; if does not, good experimentation can be carried out with pencil-and-paper procedures.

2. Observational Method

In the observation method, the investigator will collect data through personal observations. In this method the investigator will observe the behavior of the respondents in disguise. Take the case of customers transacting with a bank. Here, the behavior of the customers like, patience while waiting, way of moving with the bank employees, helping fellow customers in filling different forms, informing the bankers if there is any excess credit in their pass books, returning excess currency to the cashier if given by him, opinion of the customers about the bank through their casual discussions, time spent in reading circulars in notice board, etc. will be observed by the investigator. Continuous monitoring of stock exchange index and share prices movements through newspaper and magazines is an example of observational method which will help investment companies and individuals effective management of portfolios.

3. Survey Method (Field Studies)

Those problems which are difficult to study by direct observation may be studied through the use of questionnaires or interviews. Surveys are usually appropriate in case of social and behavioral sciences. Surveys are concerned with describing, recording, analyzing and interpreting conditions that either exist or existed. The researcher does not manipulate the variable or arrange for events to happen. Survey are only concerned with conditions or relationships that exist, opinions that are held,

processes that are going on, effects that are evidence or trends that are developing. They primarily concerned with the present but at times do consider past events and influences as they relate to current conditions. Thus, in surveys, variables that exist or have already occurred are selected and observed.

Surveys have also been used to obtain information on political opinions, consumer preferences, health care needs, and many other topics. An adequate survey requires a carefully pre tested questionnaire, a group of interviewers trained in its use, a sample carefully selected to ensure that the respondents are representative of the population to be studied, and appropriate methods of data analysis and reporting so that the results are properly interpreted.

4. Case Studies

The case study method involves careful and complete observation of a social unit a person, a family, an institution, a cultural group or even the entire community. The case study is essentially an intensive investigation of the particular unit under consideration. The objective of the case study method is to locate the factors that account for the behavior patterns of the given unit as an integrated totality.

5. Test Method

This method is used to measure all kinds of abilities, interests, attitudes, and accomplishments. Tests enable the psychologist to obtain large quantities of data from people with minimum disturbance of their living routines and without elaborate laboratory equipment. A test essentially presents a uniform situation to a group of people who vary in aspects relevant to the situation (such as intelligence, manual dexterity, anxiety, and perceptual skills). An analysis of the results then relates variations in test scores to variations among people. Test construction and use are, however, no simple matters. They involve many steps in item preparation, scaling, and establishing norms.

RESEARCH ETHICS

In most research studies three parties are involved: the researcher, the user and the subject. The interaction of each of these parties with one or both of the other two parties identifies a series of ethical issues. A number of questions arise because researchers believe they have the right to seek information, and subjects believe that they have a certain right to privacy. Just as there are ethical aspects concerning all human interaction, there are some ethical questions about business research. Some of the codes of ethics to be followed by the researchers are as given below:

- Researcher should maintain high standards to ensure that the data are accurate.
- Researcher should not intentionally try to prove a particular point.
- Researcher should ensure that the data have been scientifically investigated and his findings are totally objective.
- Researcher should not misrepresent the statistical accuracy of the data, nor should he overstate the significance of the results by altering the findings.
- Researcher should ensure that privacy and anonymity of the respondents are preserved.
- Researcher, prior to entering business research, should check for code of ethics set out by the professional associations.

THESIS WRITING

Thesis writing is the final stage of the research. It provides the achievement of detailed knowledge over the problems. When a researcher takes a problem for study he finds modifications of his study. He applies some new techniques. There are three types of researchers who take their study in different ways: the post-graduates take their for the partial fulfillment, the doctoral degree also takes researches and professional research workers like scientists, sociologists, psychologists and anthropologists take their study for the achievement of detailed knowledge over the problems.

Characteristics of Thesis

It has following characteristics:

1. It is the final stage of the research.
2. It provides overall view and solution to the problem.
3. It provides all the elements of the project taken for study to other researchers.
4. It bears the total summary of the work.
5. It satisfies all its researchers by providing partial or detailed knowledge over their problems.

Benefits of Thesis Writing

1. The investigator classifies and systematizes his work.
2. The other researchers also may follow the same principle.
3. The students and the educators who could make use of the findings of the investigation.

Considerations in Thesis Writing

The researcher takes some major considerations which help him in writing the report in a very developed way:

i. What should the general structure of his report be ?

ii. What form should the development, evaluation and organization of his ideas take ? iii What language medium should he use for his report ?

1. What other media can he use for reinforcing his verbal report?
2. What steps should he take to get it typed correctly?

FORMAT OF THE THESIS WRITING

For the preparation of research report, the researcher should follow some steps through which he will be able to make his report a critical and synthetic one.

1. Preliminary section
2. Main Body of the report
3. Reference section.

1. The Preliminary Section

- **Title Page**

Title page carries the name of the project. It should be clearly typed in capital letters. It should be beautifully printed or typed because it impresses the mind of the readers. It creates a curiosity among them to read the report. It bears the name of the topic, name of the author, the purpose of the study, the name of the institution and the date of presentation.

- **Acknowledgment**

At the time of the study, if the researcher has received help and assistance of others, he renders thanks to them. The acknowledgment should be simple in nature.

- **Table of contents**

He should clearly mention the procedures and steps of preparation of his study in content. In content he also makes his study specific and mentions the pages which hold the length of the chapters of the study.

- **List of Tables**

A statistical analysis is clearer when it is mentioned through tables.

- **List of Figures.** Examples and points maybe given through figures by utilizing Roman numerals like (i) (ii) (iii), etc. In all pages of preliminary section, body of the report, and reference section are numbered with Roman numerals.

2. Main Body

This section may be divided into five divisions:

(a) The first section of this branch introduces the topic. Introduction of the topic may follow the statement of the problem, significance or actual need of the problem for the study, purposes of the study and assumptions and limitations. All these steps in introduction of the topic should be carefully defined.

(b) The second section of the study analyses the important ***literature*** related to the study. Previous studies, if any in the area, are taken for reviewing.

(c) The third section of the study explains the ***design of the study.*** The tools and techniques which are used for making the study smooth and to make the study systematic are described in detail. The source from where the data have been collected and the methods used for collecting data and devices used for collecting data should be clearly mentioned.

(d) It deals with the ***presentation and analysis of data***. It is the most important stage of research project. Through textual discussions and tabular and graphic devices the data are analysed and reported.

(e) It holds the ***summary and conclusions*** of the total work. After a critical discussion of the total project, the summary is drawn. It represents the most significant result of the investigation. The summary should be ideal in writing because it makes the readers interested to read whole project.

3. Reference Section

Each and every research work is based on a set of literature which forms the foundation for the research theme. This includes identification of the broader area of research and then narrows downing the specific research issues which are not yet tried by other researchers. Further, literatures are helpful for using appropriate tools of analysis. The references can be classified into journals, books, magazines, newspapers, research studies etc. Following points should be kept in mind while mentioning the references:

(a) Reference section of the study occupies a very important place in the research study. Reference followed at the time of study should be arranged in bibliography alphabetically. The title of the author is listed first. The short statement on references should be given for the clear understanding and the actual usefulness.

(b) The articles which are taken from journals should be included in the bibliography as per the following format:
Author(s), Title of the article, Name of the journal, Volume of the journal, Issue number of the volume, Year of publication, from to numbers of the pages of the article.

(c) Appendix is preceded by a sheet containing the word APPENDIX capitalized and centered on the page. Tables and data, questionnaires, tests and other data gathering devices may be placed in the appendix.

(d) Foot-notes are very essential in report writing. The researcher should give the required explanations and references through foot-notes which will help other researchers to follow. These are placed at the bottom of the page.

MEDIUM OF THE REPORT

Research reports make use of two kinds of media: verbal, and language.

1. ***Verb-Verbal means language.*** Effective report writing is not an easy task. Even if skillful and experienced, investigators have to draft their report very carefully. They revise it many times before the final manuscript is ready. While preparing the report a careful attention should be given on grammatical construction of the sentences. The use of words and expressions should be properly organised and errors of spellings, abbreviations, capital letters, and quotation marks should be properly watched.
2. ***Illustrations.*** Maps, charts, diagrams, graphs, tables should be placed properly. There must be explanations of purpose of giving illustrations.

TYPING OF REPORT

A. ***Typing of the report is very important.*** After writing the manuscript by the researcher it should be typed well. When the whole work will be typed at that time the researcher should take the following steps into account:

(i) Typing sheets must be clean, distinct and legible.

(ii) Strike-over should not be made.

(iii) Typing must be one-sided.

(iv) Headings should be typed in the center.

(v) Paragraphs; quotations and footnotes should be mentioned in appropriate places.

(vi) Ditto marks should not be used. (vii)An efficient typist should be engaged.

(viii) After typing the researcher should read it carefully

(ix) All copies of the report must be legible.

(x) When the typed report is ready, the researcher should check it carefully and make some corrections if errors are found.

B. ***The following features of the report should be typed:***

(a) Title page

(b) Acknowledgment

(c) Table of contents

(d) List of Tables

(e) List of Figures

(f) Different Chapters

(g) Quotations

(h) Footnotes

(i) Tables

(j) Figures

(k) Bibliography

(l) Appendix

(m) Index

C. **After the neat and careful** typing of the report the loose sheets will be systematically arranged through page marks and will be given for binding which will be used as books for further reference.

PAPER

A paper is defined as an essay or dissertation read at a seminar or published on a journal. It is either a result of research effort or an intellectual exercise. A research paper may entail all the steps of research such as literature survey, data collection and so on. It usually follows the journal's editorial policy. Conceptual papers are not based on data. It presents facts of research in a logical and lucid style. They can be analytical or argumentative. The paper usually requires that the sources are cited in a bibliography given at the end.

ARTICLE

- The articles are usually informative in nature, which typically address the topic in a general scope as a means of introduction. They may appear in newspaper, magazine, consumer or industry publication.
- A research article is written by and for researchers for the purpose of making specific findings known to the scientific community at large.
- It includes a problem or question, method of research, data and conclusions. Research article is found exclusively in a peer-reviewed scientific or medical journal, such as Journal of Medical Research.
- A research article illustrates the outcome of scientific research with supporting clinical data. A research article could be used as a reference when writing a research paper.

WORKSHOPS

Workshops tend to be smaller and more intense than seminars. This format involves students practicing their new skills during the event under the watchful eye of an instructor. Hands-on workshops typically involve participants doing work on a particular issue during the program. The promise is that when they leave, they'll have at least a rough plan or tools in place to address the challenge.

SEMINAR

The word seminar is derived from the Latin word seminarium, meaning seed plot. It is formal presentation by one or more experts to a small group of audience. It can be conducted on recurring or regular basis, monthly or even weekly, there is an invited speaker, and audience is much more technically versed or specific in nature.

The motive behind the seminar system is to familiarize the students extensively with vital aspects of their study and also to allow them to interact with examples of practical problems that always occur during study or research work. A seminar is, thus, a form of academic instruction either at an academic institution or offered by a commercial or professional organization.

Seminars focus on some particular subject in which everyone present is requested to actively participate.

SYMPOSIUM

It is usually a formal meeting at which specialists deliver short address on a topic or on related topics and then answer the questions relating to these topics. It is especially one in which the participants form an audience and make presentations. Symposium is also defined as a collection of writings on a particular topic, as in a magazine.

COLLOQUIUM

It is usually an academic meeting at which specialists deliver addresses on a topic or on related topics and then answer the questions relating to these topics. A colloquium is targeted to a well-educated but not specialized audience.

CONFERENCE

A conference is a meeting of people who confer about a topic. It is a meeting where people come for discussion. It features keynotes and presentations delivered to all attendance, as well as multiple breakout sessions. Attendencees expect to receive information about industry trends and developments. It can be an academic conference, a business conference, a parent teacher conference, a peace conference or so on.

MEETING

A meeting is an assembly or coming together of people whether it is a symposium, workshop, conference or so. In a very remote sort of way, all of them convey the same meaning- that is, people coming together for a purpose.

MCQS/PRACTICE QUESTIONS

1. Bibliography given in a research report
(a) Helps those interested in further research and studying the problem from another angle
(b) Shows the vast knowledge of the researcher
(c) Makes the report authentic
(d) None of the above
Ans: a

2. Which comes first, theory or research?
a) Theory, because otherwise you are working in the dark
b) Research, because that's the only way you can develop a theory
c) It depends on your point of view
d) The question is meaningless, because you can't have one without the other
Ans: c

3. We review the relevant literature to know:
a) What is already known about the topic
b) What concepts and theories have been applied to the topic
c) Who are the key contributors to the topic
d) All of the above
Ans: d

4. A deductive theory is one that:
a) Allows theory to emerge out of the data
b) Involves testing an explicitly defined hypothesis
c) Allows for findings to feed back into the stock of knowledge
d) Uses qualitative methods whenever possible
Ans: b

5. Which of the following is not a type of research question?
a) Predicting an outcome
b) Evaluating a phenomenon
c) Developing good practice
d) A hypothesis
Ans: d

6. What does 'sampling cases' mean?
a) Sampling using a sampling frame
b) Identifying people who are suitable for research
c) Literally, the researcher's brief-case
d) Sampling people, newspapers, television programmes etc.
Ans: d

7. The core ingredients of a dissertation are:
a) Introduction; Data collection; Data analysis; Conclusions and recommendations.
b) Executive summary; Literature review; Data gathered; Conclusions; Bibliography.
c) Research plan; Research data; Analysis; References.
d) Introduction; Literature review; Research methods; Results; Discussion; Conclusion
Ans: d

8. Which of the following is not a data-collection method?
a) Research questions
b) Unstructured interviewing
c) Postal survey questionnaires
d) Participant observation
Ans: a

9. The research antagonistic to ex-post facto research is
(a) experimental studies
(b) library researches
(c) normative researches
(d) all of the above
Ans: a

10. An example of scientific knowledge is
(a) social traditions and customs
(b) authority of the Prophet or great men
(c) religious scriptures
(d) laboratory and field experiments
Ans: d

11. The process not needed in experimental researches is
(a) controlling
(b) observation
(c) manipulation and replication
(d) reference collection
Ans: d

12. Below are given some probable characteristics of an ineffective teacher, which of them is most likely to be characterized the ineffective teacher
(a) Emphasis upon pupil discussion in the clarification of groups goals.
(b) Emphasis upon standards.
(c) emphasis upon the control of the immediate situation
(d) None of the above.
Ans: c

13. The per capital income of India from 1950 to 1990 is four times. This study is
(a) social
(b) factorial
(c) longitudinal
(d) horizontal
Ans: c

14. Nine years old children are taller than 7 years old ones. It is an example of
(a) vertical studies
(b) cross-sectional studies
(c) experimental studies
(d) case studies
Ans: b

15. Attributes of objects, events or things which can be measured are called
(a) data
(b) qualitative measure
(c) variables
(d) none of the above
Ans: c

16. In order to augment the accuracy of the study a researcher
(a) should be honest and unbiased
(b) should increase the size of the sample
(c) should keep the variance high
(d) all of these
Ans: d

17. Hypothesis cannot be stated in
(a) declarative terms
(b) null and question form terms
(c) general terms
(d) directional terms
Ans: c

18. All cause non sampling errors except
(a) faulty tools of measurement
(b) inadequate sample
(c) defect in data collection
(d) non response
Ans: b

19. Formulation of hypothesis may not be necessary in
(a) survey studies
(b) fact finding (historical) studies
(c) experimental studies
(d) normative studies
Ans: b

20. Who is regarded the father of scientific social surveys ?
(a) Best
(b) Booth
(c) Darwin
(d) None of these
Ans: b

21. For doing external criticism (for establishing the authenticity of data) a researcher must verify

(a) the signature and handwriting of the author
(b) the paper and ink used in that period which is under study
(c) style of prose writing of that period
(d) all of the above

Ans: d

22. Survey study aims at

(i) knowing facts about the existing situation
(ii) comparing the present status with the standard norms
(iii) criticising the existing situation
(iv) identifying the means of improving the existing situation
(a) (i) and (ii) only
(b) (i),(ii)and(iii)
(c) (i),(ii),(iii)and(iv)
(d) (ii) and (iii) only

Ans: b

23. Which of the following is not the characteristic of a researcher?

(a) He is industrious and persistent on the trial of discovery
(b) He is a specialist rather than a generalist
(c) He is objective
(d) He is not versatile in his interest and even in his native abilities

Ans: d

24. The validity and reliability of a research will be at stake when

(a) The incident was reported after a long period of time from that of its occurrence
(b) The author who is the source of information is biased, incompetent or dishonest
(c) The researcher himself is not competent enough to draw logical conclusions.
(d) All of the above.

Ans: d

25. A researcher wants to study the future of the Congress I in India. For the study which tool is most appropriate for him?

(a) Questionnaire
(b) Rating scale
(c) Interview
(d) Schedule

Ans: a

26. Catharsis means discharge of emotions. A teacher can let off pent-up energy of his disciples through

(a) Picnics / excursions
(b) mock-parliament
(c) Celebration of festivals
(d) All of the above

Ans: d

27. Seeing a very big turnout, it was reported that JD will win the election, the conclusion was based on

(a) Random sampling
(b) Cluster sampling
(c) Purposive sampling
(d) Systematic sampling

Ans: b

28. A researcher divides his population into certain groups and fixes the size of the sample from each group. It is called

(a) Stratified sample
(b) Quota sample
(c) Cluster sample
(d) all of the above

Ans: b

29. Which technique is generally followed when the population is finite?

(a) Purposive sampling technique
(b) Area sampling technique
(c) Systematic sampling technique
(d) None of the above

Ans: c

30. Which of the following is a non-probability sample?

(a) Quota sample
(b) Simple random sample
(c) Purposive sample
(d) (a) and (c) both

Ans: d

31. If a researcher is studying the effect of using laptops in his classroom to ascertain their merit and worth, he is likely conducting which type of research?

(a) Basic
(b) Applied
(c) Evaluation
(d) Experimental

Ans : c

32. A researcher selects a probability sample of 100 out of the total population. It is

(a) a cluster sample
(b) a random sample
(c) a systematic sample
(d) a stratified sample

Ans: b

33. Service rules for college and university teachers should be in line with bureaucrats and executives. Do you support the statement?

(a) More or less with some modifications.
(b) Definitely not
(c) Yes basically, but with major variation in many cases.
(d) All of the above

Ans: c

34. The most important task in teaching is

(a) Directing students in development of experiences.
(b) making assignments and hearing recitations
(c) making monthly reports and maintaining records
(d) None of the above

Ans: a

35. A good hypothesis should be

(a) formulated in such a way that it can be tested by the data
(b) precise, specific and consistent with most known facts
(c) of limited scope and should not have global significance
(d) all of these

Ans: d

36. While writing research report a researcher

(a) must arrange it in logical, topical and chronological order
(b) must not use the numerical figures in numbers in the beginning of sentences
(c) must compare his results with those of the other studies
(d) all of the above

Ans: d

37. Which of the following is a primary source of data ?

(a) Official records – governments' documents, information preserved by social religious organizations etc.
(b) Personal records, letters, diaries, auto-biographies, wills, etc.
(c) Oral testimony of traditions and customs
(d) All of the above

Ans: d

38. Field study is related to

(a) real life situations
(b) laboratory situations
(c) experimental situations
(d) none of the above

Ans: a

39. A researcher divides the populations into PG, graduates and 10+2 students and using the random digit table he selects some of them from each. This is technically called

(a) stratified sampling
(b) stratified random sampling
(c) representative sampling,
(d) none of these

Ans: b

40. A statistical measure based upon the entire population is called parameter while measure based upon a sample is known as

(a) sample parameter
(b) inference
(c) statistic
(d) none of these

Ans: c

41. Generalized conclusion on the basis of a sample is technically known as

(a) Statistical inference of external validity of the research
(b) Parameter inference
(c) Data analysis and interpretation
(d) all of the above

Ans: a

42. Validity of a research can be improved by

(a) Taking the true representative sample of the population
(b) Eliminating extraneous factors
(c) Both of the above measures
(d) None of these

Ans: c

43. Researchers are generally treated as 'Identity symbols' of a nation because

(a) Researches reflect the progress of a nation
(b) Researches focus on human development
(c) Researches help in acquiring international prestige
(d) All the above

Ans: d

44. In Hindi language the term Anusandhan refers to

(a) Follower of an aim
(b) Preying of an aim
(c) Attain the aim
(d) Become goal-oriented

Ans: a

45. Research is based upon

(a) Scientific method
(b) Experiments
(c) Scientists
(d) General principles

Ans: a

46. The main condition which should be followed by research is

(a) Honest exploration
(b) Knowledge of facts and principles
(c) Standardized findings and conclusions
(d) All the above

Ans: d

47. A research should be

(a) Objective
(b) Valid
(c) Reliable
(d) All the above Ans: d

48. Reliability is the fundamental quality of a' research which also reflects

(a) Validity
(b) Verifiability
(c) Purity of data
(d) Superiority Ans: a

48. The research is always

(a) Exploring new knowledge
(b) Verifying the old knowledge
(c) Filling the gap between the knowledge
(d) Including all the above Ans: d

49. Generally the data of the research is

(a) Quantitative only
(b) Qualitative only
(c) Both of the above

Ans: c

50. The meaning of generalization is

(a) To normalize a special quality
(b) To implement the research conclusion at the larger level
(c) To give advantages of research to normal person
(d) None of the above

Ans: b

51. The aims of research is/are

(a) Factual
(b) Verifiable
(c) Theoretical
(d) All the above

Ans: d

52. Factual aims of research have the quality of

(a) Descriptive nature
(b) Foundation on human values
(c) Cause-effect relatedness
(d) All of the above

Ans: a

53. The factual aims are most important in

(a) Historical researches
(b) Behavioural researches
(c) Theoretical researches
(d) Philosophical researches

Ans: a

54. Which of the following is classified in the category of the developmental research?

(a) Philosophical research
(b) Action-research
(c) Descriptive research
(d) All the above

Ans: b

55. On the basis of contributions made, all the researches can be classified as

(a) Fundamental-Applied-Action Research
(b) Experimental-Historical Philosophical
(c) Longitudinal and Cross-sectional
(d) None of the above

Ans: a

56. Research approaches are

(a) Longitudinal and cross-sectional
(b) Oblique and horizontal
(c) Long and short section
(d) None of the above

Ans: a

57. Generally the formulation and progress of new knowledge have been carried out through

(a) Fundamental researches
(b) Experimental researches
(c) Historical researches
(d) None of the above

Ans: a

58. The survey research are classified under the

(a) Fundamental researches
(b) Experimental researches
(c) Both of the above
(d) None of the above

Ans: c

59. The research which is exploring new facts through the study of the past is called as

(a) Historical research
(b) Philosophical research

(c) Mythological research
(d) None of the above Ans: a

60. The principles formulated by the Fundamental research are used in

(a) Applied researches
(b) Philosophical researches
(c) Action researches
(d) None of the above Ans: a

61.The research is (in reference to human nature)

(a) An attitude of inquiry
(b) A method of formulating principles
(c) A systematic and intellectual work
(d) A scientific method Ans: a

62. Action-research is

(a) An applied research
(b) A research carried out to solve immediate problems
(c) A longitudinal research
(d) All the above

Ans: b

63. 'Ganga Action Plan' – is an Action Research Plan because it has

(a) To attain a definite goal
(b) To finish in a scheduled time
(c) A definite socio-economic order
(d) All the above

Ans: d

64. The single difference between Longitudinal and Cross-sectional researches is

(a) In Longitudinal researches, researcher works on single group of subjects for long term duration while in cross-section, the immediate results have been derived after selecting a sample
(b) In Longitudinal researchers the researcher should have more patience to work than in cross- sectional researches
(c) The Longitudinal researches have been generally carried out under the specific situation and with specific persons but it are not carried out in cross-sectional researches.
(d) All the above differences are correct.

Ans: d

65. The best quality of a researcher is

(a) Curiosity
(b) Active imagination
(c) Ability
(d) All the above Ans: a

66. The Scientific Method is used in

(a) Scientific researches
(b) Social science researches
(c) Both of the above
(d) None of the above

Ans: c

67. The source of a problem is

(a) Historical records
(b) The virgin areas of research
(c) The conclusions whose verification is still to be carried out
(d) All the above

Ans: d

68. The basis of selection of the problem is

(a) Two just opposite experiences
(b) The suggestions given after research
(c) The counseling with experts
(d) All the above

Ans: d

69. Generally at present the following tradition has been observed for doing research:

(a) The supervisor putting the problem to student's mind without considering his ability, interest etc.
(b) The researchers themselves work hard to search a good problem
(c) By doing slight changes in the existing topics, variables etc., new problems have been worked out easily
(d) Both A and C in the above

Ans: d

70. The quality of a problem is
(a) Clarity
(b) Worth for solution
(c) Hypothesis oriented
(d) All the above
Ans: d

71. Which one of the following is NOT a quality of a problem?
(a) Innate nature of the problem
(b) Practicality of the problem
(c) Problem according to the interests of the researcher
(d) Measurability of problem
Ans: a

72. The basic principle of problem selection is
(a) Novelty of a problem
(b) Practicality of a problem
(c) Future-orientation of a problem
(d) All the above
Ans: d

73. Which one of the following is treated as basis of evaluation for the proposed problem of research?
(a) Novelty of a problem
(b) Presence of problem-solving potentiality
(c) Possibilities of data collection from the sample
(d) All the above
Ans: d

74. The background of the Historical researches is
(a) In the form of chronological sequence
(b) In the form of historical data and facts
(c) Both of the above
(d) None of the above
Ans: c

75. The synopsis of research is called
(a) Blueprint
(b) Mapping of problem
(c) Base of a problem
(d) All the above Ans: d

76. The advantages of synopsis is/are
(a) It clearly shows the way of research
(b) It visualizes the various difficulties related with different steps of research
(c) It helps in planning various steps of the research
(d) All the above
Ans: d

77. The nature of a hypothesis can be
(a) Conceptual
(b) Declarative
(c) Action-oriented
(d) All the above
Ans: d

78. The type of hypothesis is
(a) Interrogative form
(b) Declarative form
(c) Directional form
(d) All the above
Ans: d

79. The meaning of a declarative hypothesis is
(a) The declaration of the relationship among the variables
(b) The expression of the correlations among the variables
(c) Both of the above are correct
(d) None of the above is correct
Ans: c

80. When a possible solution to the problem has been written in desired direction, this type of hypothesis is called
(a) Directional hypothesis
(b) Non-directional hypothesis

(c) Declarative hypothesis
(d) None of the above
Ans: a

81. Which of the following precaution should be kept in mind by the researcher during the selection of a representative sample?
(a) Deep knowledge of the target population
(b) The adequate knowledge of the sampling techniques
(c) Accurate implementation of the sampling design
(d) All the above
Ans: d

82. The meaning of the probability sampling is
(a) Where lies the uniform probability of inclusion of all the elements of the population in a sample
(b) Where the complete representativeness of the population is considered
(c) Where no prejudices exist with any element of the sample
(d) All the above Ans: d

83. In Non-probability sampling the probability exists of
(a) Insufficient population
(b) Limitations of data
(c) Both of the above
(d) None of the above
Ans: c

84. The meaning of Randomization is
(a) Each element of population has equal chances to be included in the sample
(b) The selection of an individual from population does not pose threat to the selection of other individuals in the sample
(c) The method does not include the personal basis
(d) All the above
Ans: d

85. The method of Randomization is
(a) Lottery or coin method
(b) Blind folded on dice method
(c) Tippit's table of irregular members
(d) All the above
Ans: d

86. The advantage of random sampling is
(a) It is the excellent method of sample se-lection
(b) It is an economic method in terms of money, time, and energy
(c) It produces accurate results
(d) All the above
Ans: d

87. The quality of probable sample is
(a) It represents the population in excellent manner
(b) It has normal distribution of the data gathered from the sample
(c) The data is analysed through normal statistical techniques
(d) All the above
Ans: d

88. The limitation of the probability sample is
(a) It does not guarantee representativeness of the sample from a population
(b) The data do not fulfill the standards of the normal probability curve
(c) It has great risk of generalization of the results
(d) All the above statements are correct.
Ans: d

89. The quality of Non-probability sampling is
(a) Easy and convenient selection of the sample
(b) It has no question of probability of selection of an element
(c) It can be analysed through simple statistical method
(d) All the above are correct
Ans: d

90. In Stratified sampling the units are selected
(a) After dividing the population in different groups on the basis of specific standard and then taking an equal proportion of units from each group
(b) After dissociating the population in different groups on the basis of specific standard and then the units are selected from these

groups.
(c) After dividing the population in different 'strata' and then selecting any one strata out of them
(d) None of the above
Ans: a

91. Suppose the population is quite comprehensive and distributed in a large geographical area. In such a situation what kind of sampling procedure would you like to prefer?
(a) Multi level sampling
(b) Systematic sampling
(c) Cluster sampling
(d) None of the above
Ans: c

92. The Purposive sample will be
(a) Depending on the researcher's whims
(b) Based upon a specific objective of sampling procedure
(c) Based on the excellent method of sampling
(d) None of the above
Ans: b

93. The types of Historical method are
(a) Descriptive and Analytical
(b) Historical-Constitutional and Reporting
(c) School survey and social surveys
(d) Survey Examination – Questionnaire survey
Ans: b

94. The position of sample in Survey method is
(a) Essential
(b) Partial
(c) Constant
(d) None of the above
Ans: a

95. Generally the external and internal validity is present in the inference which we get from
(a) Experimental method
(b) Survey method
(c) Ex Post Facto method
(d) None of the above
Ans: c

96. Which of the following method is free from the difficulties related with sampling, control and validity of inferences?
(a) Historical method
(b) Philosophical method
(c) Experimental method
(d) Survey method
Ans: a

97. The internal validity related with inferences is associated to
(a) Ex post Facto method of research
(b) Experimental method of research
(c) Both of the above
(d) None of the above
Ans: b

98. Which one of the following research methods has the similarity in nature when compared in relation to sample, control and validity of inferences?
(a) Experimental and Ex Post Facto method
(b) Historical and philosophical method
(c) Survey and Experimental method
(d) None of the above
Ans: b

99. Survey method is associated with
(a) Those exercises which are continued regularly
(b) Those processes which are continued regularly
(c) The experiences which have been already realized
(d) All the above
Ans: d

100. Which one of the characteristics is not related to survey method of research ?

(a) It organises scientific principles.
(b) It is comparatively more difficult and changeable.
(c) It requires imaginary planning.
(d) It is not related with person's qualities

Ans: a

101. The characteristic of survey method is

(a) To solve the problems at local level
(b) To enhance the body of knowledge
(c) To solve the present problems
(d) All the above

Ans: d

102. On the basis of the nature of variable, the types of survey method are

(a) Stratified survey and survey researches
(b) Sample and population related researches
(c) Surveys through Questionnaire and interviews
(d) All the above

Ans: a

103. Descriptive study is related with

(a) Survey research method
(b) Experimental research method
(c) Case study method
(d) All the above

Ans: d

104. The objective of Descriptive Research is

(a) To identify and focus on the present conditions
(b) To study the subject on phenomenon in a speedy manner
(c) To collect the facts
(d) All the above

Ans: d

105. The meaning of the Historical method of research is

(a) To employ scientific method in order to study the historical problems
(b) To establish relationship between historical facts and current events
(c) To make specific investigation of the past events
(d) All the above

Ans: d

106. The steps of the Historical method of research are given in a jumbled state. Select them in a scientific order from the following options

1. Identification of the proble
2. Criticism of data
3. Interpretation of data
4. Collection of data

(a) 1,4, 3 and 2
(b) 1,2, 3 and 4
(c) 1, 3, 2 and 4
(d) 4, 3, 2 and 1

Ans: a

107. The need of philosophical research method is desired in

(a) Philosophy related researches
(b) All the researches involved in exploring the aims of social sciences
(c) Explorations of Atma and Paramatma
(d) Determining the role and extension of philosophy

Ans: b

108. The experimental method is

(a) A method for verifying a hypothesis
(b) A method deriving inferences
(c) A variable controlling method
(d) None of the above

Ans: a

109. The wrong statement in relation to experimental method is

(a) Observation under controlled condition is experiment
(b) It is the method of effective control of variables
(c) Careful observation of a phenomenon under controlled conditions

(d) It is a useful method in laboratories.

Ans: d

110. Generally variables are of

(a) Two types – Independent and dependent variables
(b) Three types- Independent, dependent and intervening variables
(c) Four types – Independent, dependent,Intervening and control variables
(d) None of the above

Ans: c

111. The characteristic(s) of experimental method is/are

(a) It follows the law of single variable
(b) It is the laboratory method of research and has borrowed from pure sciences
(c) It follows the scientific method
(d) All the above statements are correct

Ans: d

112. The meaning of Ex post Facto Research is

(a) The research carried out after the incident
(b) The research carried out prior to the incident
(c) The research carried out along with the happening of an incident
(d) The research carried out keeping in mind the possibilities of an incident Ans: a

113. In correlation design of Ex Post Facto Research, we study

(a) The variable which has been measured in advance and will work as a causative factor for second variable
(b) The second variable which is going to be measured and will work as a causative factor for antecedent variable
(c) The third variable which cannot be measured but works as a causative factor for first and second variable
(d) All the above three situations and occurrence of variables.

Ans: d

114. The contribution of case-study is

(a) In study and data collection of a case related to caste, age, sex, religion, problems, intellectual level, socio-economic status etc.
(b) In evaluation of historical facts related with persons or case
(c) In study of institutionalized groups and families
(d) In all the above studies

Ans: d

115. The objective of case-study is

(a) Remedial
(b) Diagnostic
(c) Educational
(d) All the above

Ans: d

116. Case-study collects the data from the following sources

(a) From individual
(b) From anecdotal records
(c) From government documents
(d) From all the above

Ans: d

117. Research is a

(a) Value oriented process
(b) Passive process
(c) Self contained process
(d) Discovery oriented process

Ans: a

118. The researcher has secretly placed him or herself (as a member) in the group that is being studied. This researcher may be which of the following?

(a) A complete participant
(b) An observer-as-participant
(c) A participant-as-observer
(d) None of the above

Ans: a

119. Suppose a researcher has some prejudice in relation to some problem, then the research carried out by him, is called as

(a) Value oriented research
(b) Polluted research
(c) Inadequate research

(d) Prejudiced research

Ans: b

120. What will you do to make your research value oriented?

(a) You pay the cost of its writing to a ghost writer

(b) You will charge the market rate for the work, you have conducted so far

(c) You will ensure honesty and faith in the research work

(d) You will undertake a plagiarism

Ans: c

121. When a researcher is engaged in research in a subjective manner, the result will be

(a) inadequate formulation of objectives

(b) inadequate selection of apparatus

(c) inadequate collection of data

(d) All of the above Ans: d

122. 'The research should not be carried out with blind-folded eyes'-the meaning of this phrase is

(a) The research should be free from all personal biases

(b) The research should be free from personal limitations

(c) The research should be separated from personal ideology

(d) All of the above

Ans: d

123. The objectivity of the research can be enhanced

(a) Through its reliability

(b) Through its validity

(c) Through its impartiality

(d) All of the above

Ans: d

124. A census taker often collects data through which of the following?

(a) Standardized tests

(b) Interviews

(c) Secondary data

(d) Observations

Ans.b

125. In order to inculcate the ethical values in the researches, it is essential that it should be

(a) In accordance with the researcher's abilities

(b) Providing opportunities to the researcher to work freely

(c) Inculcate maturity in the researcher

(d) All of the above

Ans: a

126. Each word of a research should be

(a) Justifiable

(b) Full of wisdom

(c) Enjoyable

(d) Entertaining

Ans: a

127. If a researcher has the quality of exploration and has the fine skills in his field of research, the research will be

(a) Value oriented

(b) Comprehension oriented

(c) Anxiety oriented

(d) Thinking oriented

Ans: a

128. The research papers are written in order to

(a) Gain name and fame

(b) Communicate the research

(c) Get promotions

(d) None of the above

Ans: b

129. The research papers are generally prepared by

(a) The research scholars

(b) The research supervisors

(c) The scientists

(d) All of the above

Ans: d

130. The process of writing a research paper is
(a) The research-innovation employed in research paper
(b) The effective conclusions of the research paper
(c) All of the above
Ans: c
131. The background of the research paper maybe
(a) Philosophical
(b) Historical
(c) Contemporary
(d) None of the above
Ans: d
132. Generally research papers have been given more weightage instead of Research articles because these will be
(a) Based on data
(b) Incorporated with statistics
(c) Both of the above
(d) None of the above
Ans: c
133. Generally research papers are presented abundantly in
(a) Seminars
(b) Journals
(c) Symposiums
(d) All of the above
Ans: d
134. Conference is a
(a) Provision to discuss on serious matters
(b) Adequate solution of research problems
(c) Wider manipulation of research inferences
(d) All of the above
Ans: d
135. The main objective of organizing a work-shop is
(a) To improve the skills of the researchers in order to solve the specific problem
(b) To impart practical training to the re-searchers
(c) To make perfect the researchers in an area of research.
(d) All of the above
Ans: d
136. Generally the objective of organizing a workshop is
(a) To develop the research attitude in the researchers.
(b) To tell about the research methodology to the neo-researchers.
(c) To impart practical training of conducting research
(d) None of the above
Ans: c
137. The central role in workshop is of
(a) The Director
(b) The Expert
(c) The Participants
(d) All of the above
Ans: b
138. The characteristic feature of a workshop is
(a) To attain the higher cognitive and psychomotor objectives of the research
(b) To comprehend the theoretical and practical aspects of the research
(c) To explore the possibilities of applied aspects of the research
(d) All of the above
Ans: d
139. Seminar is
(a) The process of promoting the reflective level
(b) The process of nurturing the higher cognition
(c) The interactional process of thinking
(d) All of the above are true
Ans: d
140. The main cognitive objective of seminar is
(a) To develop critical and analytical capacities in a researcher

(b) To develop observational and experiential presenting capabilities in a re searcher
(c) To develop synthetic and evaluation related abilities in a researcher
(d) All of the above are correctstatements
Ans: d

141. The constituents of a seminar are
(a) Organizer-Chairman-Speakers-Participants
(b) President-Chairman-Workers
(c) Chairman-Participants only
(d) None of the above
Ans: a

142. Symposium is
(a) Intellectual entertainment
(b) Hearty entertainment
(c) TV. related entertainment
(d) Research with entertainment Ans: a

143. The aim of symposium is
(a) To develop the knowledge about current problems and the capacity to identify them
(b) To take decision about the problems related to research topics
(c) To seek advice of the experts in the area
(d) All of the above
Ans: d

144. The method of Research reporting should be
(a) Scientific
(b) Ethical and attractive
(c) Personal
(d) Favourable to globalization
Ans: a

145. The advantage of Research report writing in a scientific manner is
(a) Global Standardization
(b) Global Communication
(c) Global Awakening
(d) Global Welfare
Ans: b

146. The middle part of the Research Synopsis prepares
(a) The middle most part of research
(b) The partial part of research
(c) The complete part of research
(d) It is difficult to infer
Ans: a

147. Generally the synopsis of the research is compared with human body. Inspite of the differences existing in its different parts, it must have
(a) Uniformity
(b) Equality
(c) Functional continuity (d)None of the above Ans: c

148. When a thesis has been submitted in order to attain a degree or related contain objective, the supervisor's certificate has been produced because
(a) It ensures the quality of research
(b) It gives name and fame to the worker
(c) It gives clearance from all boundations
(d) It ensures authenticity of the research work
Ans: d

149. The beauty of the Research thesis can be enhanced
(a) By keeping aesthetic sense in its typography
(b) By giving good charts, flow diagrams and systematic graphs
(c) By having an excellent binding and title page
(d) All the above
Ans: d

150. In Research thesis the importance of introduction is
(a) It imbibes the importance of problem in it

(b) It determines the direction of survey related to problem
(c) It explains the objectives of the problem
(d) All the above

Ans: d

151. The Research design is related to

(a) Sample selection
(b) Formulation of Experimental design
(c) Selection and construction of the tool
(d) All the above

Ans: d

152. In primary sources we include

(a) Hand written manuscripts only
(b) The original writings of the authors
(c) Direct collection from the thesis
(d) All of the above

Ans: d

153. Reference serves the purpose

(a) Of lending authenticity to the giver content
(b) Of insightful decision making by the researcher
(c) Of giving ornamental value to the research
(d) If exhibits the great achievements of the piece of research

Ans: a

154. There exists a difference between the reference and bibliography

(a) The references have the actual page numbers
(b) The references have the last name of the person (Surname) on its first priority
(c) The references have the minute details in order to verify them.
(d) All the above are correct.

Ans: d

155. In an experimental research study, the primary goal is to isolate and identify the effect produced by the__.

(a) Dependent variable
(b) Extraneous variable
(c) Independent variable
(d) Confounding variable

Ans: c

156. Which of the following is characteristic of qualitative research?

(a) Generalization to the population
(b) Random sampling
(c) Unique case orientation
(d) Standardized tests and measures

Ans : c

157. _____is the study of human consciousness and individuals' experience of some phenomenon.

(a) Phenomenology
(b) Ethnography
(c) Grounded theory
(d) Case study research

Ans :a

158. Which of the following is not a form of nonrandom sampling?

(a) Snowball sampling
(b) Convenience sampling
(c) Quota sampling
(d) Purposive sampling
(e) They are all forms of nonrandom sampling

Ans : e

UNIT – 3

READING COMPREHENSIONS

UNIT 3: READING COMPREHENSIONS

QUESTIONS 1 THROUGH 7 REFER TO THE FOLLOWING PASSAGE:

In the 16th century, an age of great marine and terrestrial exploration, Ferdinand Magellan led the first expedition to sail around the world. As a young Portuguese noble, he served the king of Portugal, but he became involved in the quagmire of political intrigue at court and lost the king's favor. After he was dismissed from service by the king of Portugal, he offered to serve the future Emperor Charles V of Spain.

A papal decree of 1493 had assigned all land in the New World west of 50 degrees W longitude to Spain and all the land east of that line to Portugal. Magellan offered to prove that the East Indies fell under Spanish authority. On September 20, 1519, Magellan set sail from Spain with five ships. More than a year later, one of these ships was exploring the topography of South America in search of a water route across the continent. This ship sank, but the remaining four ships searched along the southern peninsula of South America. Finally they found the passage they sought near 50 degrees S latitude. Magellan named this passage the Strait of All Saints, but today it is known as the Strait of Magellan.

One ship deserted while in this passage and returned to Spain, so fewer sailors were privileged to gaze at that first panorama of the Pacific Ocean. Those who remained crossed the meridian now known as the International Date Line in the early spring of 1521 after 98 days on the Pacific Ocean. During those long days at sea, many of Magellan's men died of starvation and disease.

Later, Magellan became involved in an insular conflict in the Philippines and was killed in a tribal battle. Only one ship and 17 sailors under the command of the Basque navigator Elcano survived to complete the westward journey to Spain and thus prove once and for all that the world is round, with no precipice at the edge.

1. The 16th century was an age of great _____ exploration.

A. cosmic
B. land
C. mental
D. common man
E. None of the above

2. Magellan lost the favor of the king of Portugal when he became involved in a political _____.

A. entanglement
B. discussion
C. negotiation
D. problem
E. None of the above

3. The Pope divided New World lands between Spain and Portugal according to their location on one side or the other of an imaginary geographical line 50 degrees west of Greenwich that extends in a _____ direction.

A. north and south
B. crosswise
C. easterly
D. south east
E. north and west

4. One of Magellan's ships explored the _____ of South America for a passage across the continent.

A. coastline
B. mountain range
C. physical features
D. islands
E. None of the above

5. Four of the ships sought a passage along a southern _____.

A. coast
B. inland
C. body of land with water on three sides
D. border
E. Answer not available

6. The passage was found near 50 degrees S of _____.

A. Greenwich
B. The equator
C. Spain
D. Portugal
E. Madrid

7. In the spring of 1521, the ships crossed the _____ now called the International Date Line.

A. imaginary circle passing through the poles
B. imaginary line parallel to the equator
C. area

D. land mass
E. Answer not available

THE FOLLOWING PASSAGE REFERS TO QUESTIONS 8 THROUGH 14.

Marie Curie was one of the most accomplished scientists in history. Together with her husband, Pierre, she discovered radium, an element widely used for treating cancer, and studied uranium and other radioactive substances. Pierre and Marie's amicable collaboration later helped to unlock the secrets of the atom.

Marie was born in 1867 in Warsaw, Poland, where her father was a professor of physics. At an early age, she displayed a brilliant mind and a blithe personality. Her great exuberance for learning prompted her to continue with her studies after high school. She became disgruntled, however, when she learned that the university in Warsaw was closed to women. Determined to receive a higher education, she defiantly left Poland and in 1891 entered the Sorbonne, a French university, where she earned her master's degree and doctorate in physics.

Marie was fortunate to have studied at the Sorbonne with some of the greatest scientists of her day, one of whom was Pierre Curie. Marie and Pierre were married in 1895 and spent many productive years working together in the physics laboratory. A short time after they discovered radium, Pierre was killed by a horse-drawn wagon in 1906. Marie was stunned by this horrible misfortune and endured heartbreaking anguish. Despondently she recalled their close relationship and the joy that they had shared in scientific research. The fact that she had two young daughters to raise by herself greatly increased her distress.

Curie's feeling of desolation finally began to fade when she was asked to succeed her husband as a physics professor at the Sorbonne. She was the first woman to be given a professorship at the world-famous university. In 1911 she received the Nobel Prize in chemistry for isolating radium. Although Marie Curie eventually suffered a fatal illness from her long exposure to radium, she never became disillusioned about her work. Regardless of the consequences, she had dedicated herself to science and to revealing the mysteries of the physical world.

8. The Curies' _____ collaboration helped to unlock the secrets of the atom.
A. friendly
B. competitive
C. courteous
D. industrious
E. chemistry

9. Marie had a bright mind and a _____ personality.
A. strong
B. lighthearted
C. humorous
D. strange
E. envious

10. When she learned that she could not attend the university in Warsaw, she felt _____.
A. hopeless
B. annoyed
C. depressed
D. worried
E. None of the above

11. Marie _____ by leaving Poland and traveling to France to enter the Sorbonne.
A. challenged authority
B. showed intelligence
C. behaved
D. was distressed
E. Answer not available

12. _____ she remembered their joy together.
A. Dejectedly
B. Worried
C. Tearfully
D. Happily
E. Irefully

13. Her _____ began to fade when she returned to the Sorbonne to succeed her husband.
A. misfortune
B. anger
C. wretchedness
D. disappointment
E. ambition

14. Even though she became fatally ill from working with radium, Marie Curie was never _____.
A. troubled
B. worried
C. disappointed

D. sorrowful
E. disturbed

THE FOLLOWING PASSAGE REFERS TO QUESTIONS 15 THROUGH 19.

Mount Vesuvius, a volcano located between the ancient Italian cities of Pompeii and Herculaneum, has received much attention because of its frequent and destructive eruptions. The most famous of these eruptions occurred in A.D. 79.
The volcano had been inactive for centuries. There was little warning of the coming eruption, although one account unearthed by archaeologists says that a hard rain and a strong wind had disturbed the celestial calm during the preceding night. Early the next morning, the volcano poured a huge river of molten rock down upon Herculaneum, completely burying the city and filling the harbor with coagulated lava.

Meanwhile, on the other side of the mountain, cinders, stone and ash rained down on Pompeii. Sparks from the burning ash ignited the combustible rooftops quickly. Large portions of the city were destroyed in the conflagration. Fire, however, was not the only cause of destruction. Poisonous sulfuric gases saturated the air. These heavy gases were not buoyant in the atmosphere and therefore sank toward the earth and suffocated people.

Over the years, excavations of Pompeii and Herculaneum have revealed a great deal about the behavior of the volcano. By analyzing data, much as a zoologist dissects an animal specimen, scientists have concluded that the eruption changed large portions of the area's geography. For instance, it turned the Sarno River from its course and raised the level of the beach along the Bay of Naples. Meteorologists studying these events have also concluded that Vesuvius caused a huge tidal wave that affected the world's climate.

In addition to making these investigations, archaeologists have been able to study the skeletons of victims by using distilled water to wash away the volcanic ash. By strengthening the brittle bones with acrylic paint, scientists have been able to examine the skeletons and draw conclusions about the diet and habits of the residents. Finally, the excavations at both Pompeii and Herculaneum have yielded many examples of classical art, such as jewelry made of bronze, which is an alloy of copper and tin. The eruption of Mount Vesuvius and its tragic consequences have provided everyone with a wealth of data about the effects that volcanoes can have on the surrounding area. Today, volcanologists can locate and predict eruptions, saving lives and preventing the destruction of other cities and cultures.

15. Herculaneum and its harbor were buried under _____ lava.
A. liquid
B. solid
C. flowing
D. gas
E. Answer not available

16. The poisonous gases were not _____ in the air.
A. able to float
B. visible
C. able to evaporate
D. invisible
E. able to condense

17. Scientists analyzed data about Vesuvius in the same way that a zoologist _____ a specimen.
A. describes in detail
B. studies by cutting apart
C. photographs
D. chart
E. Answer not available

18. _____ have concluded that the volcanic eruption caused a tidal wave.
A. Scientists who study oceans
B. Scientists who study atmospheric conditions
C. Scientists who study ash
D. Scientists who study animal behavior
E. Answer not available in article

19. Scientists have used _____ water to wash away volcanic ash from the skeletons of victims.
A. bottled
B. volcanic
C. purified
D. sea
E. fountain

THE FOLLOWING PASSAGE REFERS TO QUESTIONS 20-24.

Conflict had existed between Spain and England since the 1570s. England wanted a share of the wealth that Spain had been taking from the lands it had claimed in the Americas.
Elizabeth I, Queen of England, encouraged her staunch admiral of the navy, Sir Francis Drake, to raid Spanish ships and towns. Though these raids were on a small scale, Drake achieved dramatic success, adding gold and silver to England's treasury and diminishing Spain's supremacy.

Religious differences also caused conflict between the two countries. Whereas Spain was Roman Catholic, most of England had become Protestant. King Philip II of Spain wanted to claim the throne and make England a Catholic country again. To satisfy his ambition and also to retaliate against England's theft of his gold and silver, King Philip began to build his fleet of warships, the Spanish Armada, in January 1586.

Philip intended his fleet to be indestructible. In addition to building new warships, he marshaled 130 sailing vessels of all types and recruited more than 19,000 robust soldiers and 8,000 sailors. Although some of his ships lacked guns and others lacked ammunition, Philip was convinced that his Armada could withstand any battle with England.

The martial Armada set sail from Lisbon, Portugal, on May 9, 1588, but bad weather forced it back to port. The voyage resumed on July 22 after the weather became more stable.

The Spanish fleet met the smaller, faster, and more maneuverable English ships in battle off the coast of Plymouth, England, first on July 31 and again on August 2. The two battles left Spain vulnerable, having lost several ships and with its ammunition depleted. On August 7, while the Armada lay at anchor on the French side of the Strait of Dover, England sent eight burning ships into the midst of the Spanish fleet to set it on fire. Blocked on one side, the Spanish ships could only drift away, their crews in panic and disorder. Before the Armada could regroup, the English attacked again on August 8.

Although the Spaniards made a valiant effort to fight back, the fleet suffered extensive damage. During the eight hours of battle, the Armada drifted perilously close to the rocky coastline. At the moment when it seemed that the Spanish ships would be driven onto the English shore, the wind shifted, and the Armada drifted out into the North Sea. The Spaniards recognized the superiority of the English fleet and returned home, defeated.

20. Sir Francis Drake added wealth to the treasury and diminished Spain's _____.

A. unlimited power
B. unrestricted growth
C. territory
D. treaties
E. Answer not available in article

21. King Philip recruited many _____ soldiers and sailors.

A. warlike
B. strong
C. accomplished
D. timid
E. inexperienced

22. The _____ Armada set sail on May 9, 1588.

A. complete
B. warlike
C. independent
D. isolated
E. Answer not available

23. The two battles left the Spanish fleet _____.

A. open to change
B. triumphant
C. open to attack
D. defeated
E. discouraged

24. The Armada was _____ on one side.

A. closed off
B. damaged
C. alone
D. circled
E. Answer not available in this article

THE FOLLOWING PASSAGE REFERS TO QUESTIONS 25-29.

The victory of the small Greek democracy of Athens over the mighty Persian Empire in 490 B.C. is one of the most famous events in history. Darius, king of the Persian Empire, was furious because Athens had interceded for the other Greek city-states in revolt against Persian domination. In anger the king sent an enormous army to defeat Athens. He thought it would take drastic steps to pacify the rebellious part of the empire.

Persia was ruled by one man. In Athens, however, all citizens helped to rule. Ennobled by this participation, Athenians were prepared to die for their city-state. Perhaps this was the secret of the remarkable victory at Marathon, which freed them from Persian rule. On their way to Marathon, the Persians tried to fool some Greek city-states by claiming to have come in peace. The frightened citizens of Delos refused to believe this. Not wanting to abet the conquest of Greece, they fled from their city and did not return until the Persians had left. They were wise, for the Persians next conquered the city of Eritrea and captured its people.

Tiny Athens stood alone against Persia. The Athenian people went to their sanctuaries. There they prayed for deliverance. They asked their gods to expedite their victory. The Athenians refurbished their weapons and moved to the plain of Marathon, where their little band would meet the Persians. At the last moment, soldiers from Plataea reinforced the Athenian troops.

The Athenian army attacked, and Greek citizens fought bravely. The power of the mighty Persians was offset by the love that the Athenians had for their city. Athenians defeated the Persians in both archery and hand combat. Greek soldiers seized Persian ships and burned them, and the Persians fled in terror. Herodotus, a famous historian, reports that 6,400 Persians died, compared to only 192 Athenians.

25. Athens had _____ the other Greek city-states against the Persians.
A. refused help to
B. intervened on behalf of
C. wanted to fight
D. given orders for all to fight
E. defeated

26. Darius took drastic steps to _____ the rebellious Athenians.
A. weaken
B. destroy
C. calm
D. irritate
E. Answer not available

27. Their participation _____ to the Athenians.
A. gave comfort
B. gave honor
C. gave strength
D. gave fear
E. gave hope

28. The people of Delos did not want to _____ the conquest of Greece.
A. end
B. encourage
C. think about
D. daydream about
E. Answer not available

29. The Athenians were _____ by some soldiers who arrived from Plataea.
A. welcomed
B. strengthened
C. held
D. captured
E. Answer not available

THE FOLLOWING PASSAGE REFERS TO QUESTIONS 30-32.

The Trojan War is one of the most famous wars in history. It is well known for the 10-year duration, for the heroism of a number of legendary characters, and for the Trojan horse. What may not be familiar, however, is the story of how the war began.

According to Greek myth, the strife between the Trojans and the Greeks started at the wedding of Peleus, King of Thessaly, and Thetis, a sea nymph. All of the gods and goddesses had been invited to the wedding celebration in Troy except Eris, goddess of discord. She had been omitted from the guest list because her presence always embroiled mortals and immortals alike in conflict.

To take revenge on those who had slighted her, Eris decided to cause a skirmish. Into the middle of the banquet hall, she threw a golden apple marked "for the most beautiful." All of the goddesses began to haggle over who should possess it. The gods and goddesses reached a stalemate when the choice was narrowed to Hera, Athena, and Aphrodite. Someone was needed to settle the controversy by picking a winner. The job eventually fell to Paris, son of King Priam of Troy, who was said to be a good judge of beauty. Paris did not have an easy job. Each goddess, eager to win the golden apple, tried aggressively to bribe him.

"I'll grant you vast kingdoms to rule," promised Hera. "Vast kingdoms are nothing in comparison with my gift," contradicted Athena. "Choose me and I'll see that you win victory and fame in war." Aphrodite outdid her adversaries, however. She won the golden apple by offering Helen, daughter of Zeus and the most beautiful mortal in the land, to Paris. Paris, anxious to claim Helen, set off for Sparta in Greece.

Although Paris learned that Helen was married, he nevertheless accepted the hospitality of her husband, King Menelaus of Sparta. Therefore, Menelaus was outraged for a number of reasons when Paris departed, taking Helen and much of the king's wealth back to Troy. Menelaus collected his loyal forces and set sail for Troy to begin the war to reclaim Helen.

30. Eris was known for _____ both mortals and immortals.
A. scheming against
B. creating conflict amongst
C. feeling hostile toward
D. ignoring
E. comforting

31. Each goddess tried _____ to bribe Paris.
A. boldly
B. effectively

C. secretly
D. carefully
E. Answer not available

32. Athena _____ Hera, promising Paris victory and fame in war.
A. disregarded the statement of
B. defeated
C. agreed with
D. restated the statement of
E. questioned the statement of

REFER TO THE FOLLOWING PASSAGE FOR QUESTIONS 33-37.

One of the most intriguing stories of the Russian Revolution concerns the identity of Anastasia, the youngest daughter of Czar Nicholas II. During his reign over Russia, the czar had planned to revoke many of the harsh laws established by previous czars. Some workers and peasants, however, clamored for more rapid social reform. In 1918, a group of these people known as Bolsheviks overthrew the government. On July 17 or 18, they murdered the czar and what was thought to be his entire family.

Although witnesses vouched that all the members of the czar's family had been executed, there were rumors suggesting that Anastasia had survived. Over the years, a number of women claimed to be Grand Duchess Anastasia. Perhaps the most famous claimant was Anastasia Tschaikovsky, who was also known as Anna Anderson.

In 1920, 18 months after the czar's execution, this terrified young woman was rescued from drowning in a Berlin river. She spent two years in a hospital, where she attempted to reclaim her health and shattered mind. The doctors and nurses thought that she resembled Anastasia and questioned her about her background. She disclaimed any connection with the czar's family. Eight years later, however, she claimed that she was Anastasia. She said that she had been rescued by two Russian soldiers after the czar and the rest of her family had been killed. Two brothers named Tschaikovsky had carried her into Romania. She had married one of the brothers, who had taken her to Berlin and left her there, penniless and without a vocation. Unable to invoke the aid of her mother's family in Germany, she had tried to drown herself.

During the next few years, scores of the czar's relatives, ex-servants, and acquaintances interviewed her. Many of these people said that her looks and mannerisms were evocative of the Anastasia that they had known. Her grandmother and other relatives denied that she was the real Anastasia, however.

Tired of being accused of fraud, Anastasia immigrated to the United States in 1928 and took the name Anna Anderson. She still wished to prove that she was Anastasia, though, and returned to Germany in 1933 to bring suit against her mother's family. There she declaimed to the court, asserting that she was indeed Anastasia and deserved her inheritance.

In 1957, the court decided that it could neither confirm nor deny Anastasia's identity. Although it will probably never be known whether this woman was the Grand Duchess Anastasia, her search to establish her identity has been the subject of numerous books, plays, and movies.

33. Some Russian peasants and workers _____ for social reform.
A. longed
B. cried out
C. begged
D. hoped
E. thought much

34. Witnesses _____ that all members of the czar's family had been executed.
A. gave assurance
B. thought
C. hoped
D. convinced some
E. Answer not available

35. Tschaikovsky initially _____ any connection with the czar's family.
A. denied
B. stopped
C. noted
D. justified
E. Answer not available

36. She was unable to _____ the aid of her relatives.
A. locate
B. speak about
C. call upon
D. identify
E. know

37. In court she _____ maintaining that she was Anastasia and deserved her inheritance.
A. finally appeared
B. spoke forcefully
C. gave testimony

D. gave evidence
E. Answer not available

REFER TO THE FOLLOWING PASSAGE FOR QUESTIONS 38-39.

King Louis XVI and Queen Marie Antoinette ruled France from 1774 to 1789, a time when the country was fighting bankruptcy. The royal couple did not let France's insecure financial situation limit their immoderate spending, however. Even though the minister of finance repeatedly warned the king and queen against wasting money, they continued to spend great fortunes on their personal pleasure. This lavish spending greatly enraged the people of France. They felt that the royal couple bought its luxurious lifestyle at the poor people's expense.

Marie Antoinette, the beautiful but exceedingly impractical queen, seemed uncaring about her subjects' misery. While French citizens begged for lower taxes, the queen embellished her palace with extravagant works of art. She also surrounded herself with artists, writers, and musicians, who encouraged the queen to spend money even more profusely.

While the queen's favorites glutted themselves on huge feasts at the royal table, many people in France were starving. The French government taxed the citizens outrageously. These high taxes paid for the entertainments the queen and her court so enjoyed. When the minister of finance tried to stop these royal spendthrifts, the queen replaced him. The intense hatred that the people felt for Louis XVI and Marie Antoinette kept building until it led to the French

Revolution. During this time of struggle and violence (1789-1799), thousands of aristocrats, as well as the king and queen themselves, lost their lives at the guillotine. Perhaps if Louis XVI and Marie Antoinette had reined in their extravagant spending, the events that rocked France would not have occurred.

38. The people surrounding the queen encouraged her to spend money _____.
A. wisely
B. abundantly
C. carefully
D. foolishly
E. joyfully

39. The minister of finance tried to curb these royal _____.
A. aristocrats
B. money wasters
C. enemies
D. individuals
E. spenders

REFER TO THE FOLLOWING PASSAGE FOR QUESTIONS 40-45.

Many great inventions are initially greeted with ridicule and disbelief. The invention of the airplane was no exception. Although many people who heard about the first powered flight on December 17, 1903 were excited and impressed, others reacted with peals of laughter. The idea of flying an aircraft was repulsive to some people. Such people called Wilbur and Orville Wright, the inventors of the first flying machine, impulsive fools. Negative reactions, however, did not stop the Wrights. Impelled by their desire to succeed, they continued their experiments in aviation.

Orville and Wilbur Wright had always had a compelling interest in aeronautics and mechanics. As young boys they earned money by making and selling kites and mechanical toys. Later, they designed a newspaper-folding machine, built a printing press, and operated a bicycle-repair shop. In 1896, when they read about the death of Otto Lilienthal, the brothers' interest in flight grew into a compulsion.

Lilienthal, a pioneer in hang-gliding, had controlled his gliders by shifting his body in the desired direction. This idea was repellent to the Wright brothers, however, and they searched for more efficient methods to control the balance of airborne vehicles. In 1900 and 1901, the Wrights tested numerous gliders and developed control techniques. The brothers' inability to obtain enough lift power for the gliders almost led them to abandon their efforts.

After further study, the Wright brothers concluded that the published tables of air pressure on curved surfaces must be wrong. They set up a wind tunnel and began a series of experiments with model wings. Because of their efforts, the old tables were repealed in time and replaced by the first reliable figures for air pressure on curved surfaces. This work, in turn, made it possible for the brothers to design a machine that would fly. In 1903 the Wrights built their first airplane, which cost less than $1,000. They even designed and built their own source of propulsion-a lightweight gasoline engine. When they started the engine on December 17, the airplane pulsated wildly before taking off. The plane managed to stay aloft for 12 seconds, however, and it flew 120 feet.

By 1905, the Wrights had perfected the first airplane that could turn, circle, and remain airborne for half an hour at a time. Others had flown in balloons and hang gliders, but the Wright brothers were the first to build a full-size machine that could fly under its own power. As the contributors of one of the most outstanding engineering achievements in history, the Wright brothers are accurately called the fathers of aviation.

40. The idea of flying an aircraft was _____ to some people.
A. boring
B. distasteful
C. exciting
D. needless
E. Answer not available

41. People thought that the Wright brothers had _____.
A. acted without thinking
B. been negatively influenced
C. been too cautious
D. been mistaken
E. acted in a negative way

42. The Wrights' interest in flight grew into a _____.
A. financial empire
B. plan
C. need to act
D. foolish thought
E. Answer not available

43. Lilienthal's idea about controlling airborne vehicles was _____ the Wrights.
A. proven wrong by
B. opposite to the ideas of
C. disliked by
D. accepted by
E. improved by

44. The old tables were _____ and replaced by the first reliable figures for air pressure on curved surfaces.
A. destroyed
B. invalidated
C. multiplied
D. approved
E. not used

45. The Wrights designed and built their own source of _____.
A. force for moving forward
B. force for turning around
C. turning
D. force for going backward
E. None of the above

ANSWERS AND EXPLANATIONS

1. B: "Terrestrial" means land. No choice here offers a synonym for "marine," e.g. nautical/naval/water/seagoing, and no other choices match either marine or terrestrial.
2. A: "Quagmire" means literally a bog or marsh, and figuratively an involved situation difficult to escape; entanglement is a synonym, more specifically similar than the other choices.
3. A: Longitudes are imaginary geographical lines running north and south. Latitudes run east and west. The other choices do not equal either latitude or longitude in direction.
4. C: Topography means the physical features of a land mass. It does not mean coastline (A), mountain range (B), or islands (D).
5. C: A peninsula is a piece of land connected to the mainland by an isthmus and projecting into the ocean such that it is surrounded on three sides by water. A peninsula is not a coast (A); it is not found inland (B); and it is not a border (D).
6. B: The passage was found near 50 degrees S latitude. Latitudes are measured horizontally, in relation to the equator or central imaginary line, equidistant between the North and South Poles. Longitudes are measured vertically. Greenwich (A), the location of zero degrees longitude, adopted as the global standard, is both incorrect and never named in the passage. Spain (C), Portugal (D), and Madrid (E) in Spain are also incorrect.
7. A: Meridians are imaginary geographical circles intersecting the poles. Imaginary lines parallel to the equator (B) are latitudes. The International Date Line is a specific meridian, not an area (C). It is not a land mass (D) as it crosses both water and land.
8. A: "Amicable" means friendly. It does not mean competitive (B), i.e. oppositional, ambitious, or aggressive; courteous (C), i.e. polite; industrious (D), i.e. hard-working; or chemistry (E): their collaboration was in physics, but moreover, the passage specifically describes their collaboration as "amicable."
9. B: "Blithe" means light-hearted. It does not mean strong (A), humorous (B) or funny; strange (D), or envious (E).
10. B: "Disgruntled" means annoyed. It does not mean hopeless (A), depressed (C), or worried (D).
11. A: Marie challenged authority by going to study at the Sorbonne, because Warsaw's university did not admit women. The passage indicates this challenge by describing her "defiantly" leaving Poland for France; i.e., she was defying authority. The passage does not indicate she showed intelligence (B), "behaved" (C), or was distressed (D) or upset by her move.
12. A: A synonym for "despondently" is "dejectedly," meaning sadly, with despair or depression. The passage indicates this by describing Curie's emotional state as one of "heartbreaking anguish" over her husband's sudden accidental death. She is not described in this passage as worried (B) by her memories, or recalling them tearfully (C), happily (D), or irefully (E), i.e. angrily.
13. C: The closest synonym for the "feeling of desolation" (despair) described in the passage is wretchedness. Misfortune (A) or ill fate/luck is not as close. Anger (B) is a separate emotion from desolation. Disappointment (D) is also different from desolation,

meaning feeling let-down rather than hopeless. Ambition (E) is drive to succeed or accomplish things. It was not Curie's ambition that faded upon returning to the Sorbonne but her depression.

14. C: "Disillusioned" means disappointed. It does not mean troubled (A), i.e. concerned or disturbed; worried (B) or anxious; sorrowful (D) or sad; or disturbed (E).

15. B: "Coagulated" means solidified. Liquid (A) is an opposite of solid. Flowing (C) assumes a liquid, not solid, state. Gas (D) is another opposite of solid. (Three states of matter, like volcanic material, are liquid, solid, and gaseous.)

16. A: "Buoyant" means able to float. The passage indicates this by indicating that the gases therefore, sank toward earth and suffocated people. Buoyant does not mean visible (B) or possible to see. Able to float/buoyant does not mean able to evaporate (C). Evaporation means turning to vapor, which only liquids can do. Gases are already vapors. Buoyant does not mean invisible (D) or unseen. Able to float does not mean able to condense (E), i.e. turn from vapor to liquid.

17. B: "Dissect" means to cut apart for study. It does not mean to describe in detail (A), to photograph (C), or to chart (D) a specimen.

18. B: Meteorologists are scientists who study atmospheric conditions, particularly weather. Scientists who study oceans (A) are oceanographers, i.e. marine scientists. Scientists who study ash (C) do not exist as members of a separate discipline. Climate scientists and many others concerned with its effects study volcanic ash. Scientists who study animal behavior (D) are ethologists or animal behaviorists and do not study ash.

19. C: Distilled water is purified water. Distilled water is not equivalent to bottled (A), volcanic (B), sea (D), or fountain (E) water.

20. A: "Supremacy" means unlimited power, not unrestricted growth (B). The passage states that Drake diminished Spain's supremacy, but does not specifically mention diminishing its territory (C). Drake's raids enriched England and reduced Spain's power; no mention is made of eliminating any treaties (D).

21. B: "Robust" means strong. It does not mean warlike (A), accomplished (C) or competent, timid (D) or fearful, or inexperienced (E).

22. B: "Martial" means warlike or war-related. It does not mean complete (A), independent (C), or isolated (D).

23. C: "Vulnerable" means open to attack or susceptible to harm. It does not mean open to change (A) or receptive, triumphant (B) or victorious, defeated (D) or beaten-they were vulnerable to attack first and then consequently were defeated-or discouraged (E), i.e. disheartened or dispirited.

24. A: The passage indicates the Armada was "blocked" on one side, i.e. closed off rather than damaged (B) (it was damaged extensively, not on one side); alone (C) or circled (D), i.e. surrounded, neither of which can be done on only one side.

25. B: "Interceded for" means intervened on behalf of, not refused help to (A), wanted to fight (C), given orders for all to fight (D), or defeated (E).

26. C: "Pacify" means to calm or make peaceful. It does not mean to make weaker (A), to destroy (B), or to irritate (D), i.e. annoy or provoke.

27. B: "Ennobled" means gave honor to or made noble. It does not mean gave comfort (A) or solace, gave strength (C), i.e. fortified or reinforced, gave fear (D) or frightened, or gave hope (E) or encouraged.

28. B: To "abet" means to enable, support, or encourage, usually in crime or doing something wrong. It does not mean to end (A), think about (C), or daydream about (D) something.

29. B: "Reinforced" means strengthened, not welcomed (A), held (C), or captured (D).

30. B: The passage states that the presence of Eris, goddess of discord, "always embroiled mortals and immortals alike in conflict." Embroiling them in conflict is creating conflict amongst them. It does not mean scheming against (A) them, feeling hostile toward (C) them, ignoring (D) them, or comforting (E) them.

31. A: "Aggressively" means boldly. It does not mean effectively (B) or successfully, secretly (C), or carefully (D).

32. A: "Contradicted" means Athena disregarded Hera's statement and disputed or countered it. It does not mean she defeated (B) her statement, agreed with (C) it, restated (D) it, or questioned (E) it.

33. B: To "clamor for" means to cry out for (something). It does not mean to long for (A) it, beg (C) for it, hope (D) for it, or think much (E) "for," of, or about it.

34. A: To "vouch" means to give assurance. It does not mean to think (B), hope (C), or convince some (D).

35. A: "Disclaimed" means denied, i.e. refused or declared untrue. It does not mean stopped (B), noted (C), or justified (D), i.e. substantiated or confirmed, the opposite of denied.

36. C: She was unable to invoke, i.e. to call upon, the aid of relatives. To invoke does not mean to locate (A) or find; to speak about (B) or discuss; to identify (D), i.e. recognize; or to know (E).

37. B: "Declaimed" means spoke forcefully. It does not mean finally appeared (A). Though she did also give testimony (C) in court, "declaimed" does not mean to testify; it describes the way she spoke while doing so. "Declaimed" also does not mean she gave evidence (D).

38. B: "Profusely" means abundantly, copiously, or excessively. It does not mean wisely (A) or carefully (B), which are both opposite in meaning to the excessive connotation of profuse spending. Foolishly (D) can be associated with spending profusely, but does not have the same meaning. Profusely does not mean joyfully (E), i.e. gleefully or happily.

39. B: "Spendthrifts" means money wasters. It does not mean aristocrats (A), i.e. nobles or privileged people. It does not mean enemies (C) or adversaries. It does not mean individuals (D) or persons. "Spenders" (E) denotes people who spend, but does not convey the sense of wasteful spending or squandering in the same way that "spendthrifts" does.

40. B: "Repulsive" means distasteful. It does not mean boring (A), exciting (C), or needless (D).

41. A: "Impulsive" means acting on impulse, i.e. acting without thinking. People thinking the Wrights "impulsive fools" does not mean they thought the Wrights had been negatively influenced (B), too cautious (C), mistaken (D), or had acted in a negative way (E).

42. C: A "compulsion" is a need or an urge to act. It is not a financial empire (A), a plan (B), or a foolish thought (D).

43. C: "Repellent" means offensive or hateful; in other words, Lilienthal's idea was disliked by the Wrights. It does not mean his idea was opposite to the idea of (B) the Wrights. It means the opposite of its being accepted by (D) the Wrights. They found his idea unpleasant rather than improving (E) on it.
44. B: "Repealed" means invalidated, i.e. disproven or overturned. It does not mean destroyed (A); multiplied (C), i.e. increased/approved (D), an antonym; or unused (E).
45. A: "Propulsion" is force for propelling or moving forward. It does not mean force for turning around (B), turning (C) (oscillation perhaps), or force for going backward (D) (like repulsion).

UNIT – 4

COMMUNICATION

UNIT 4: COMMUNICATION

CONTENTS:

- Introduction to Communication
- Various definition
- Process of communication
- Forms and types of communication
- Communication models and theories
- Barriers to effective communication
- Organizational communication
- Formal communication channels and network Pro and Cons
- Organizational Communication channel network and Pro and Cons
- Classroom Communication
- MCQs

INTRODUCTION TO COMMUNICATION

Communication is defined as "the process of passing information and understanding from one person to another, it is essentially a bridge of meaning between people" All communication is essentially sharing of information or some message. Communication is the most important of our social activities.

We can classify communication as interpersonal, intrapersonal, group communication, Meta communication, upward, downward, lateral, diagonal, formal, informal, oral, written or non verbal communication.

In terms of Business "Communication is an important requirement of every business. A businessman participates in the process of communication in many ways. For instance, he informs the consumer about his product, he motivate them to do the work or collects information about the progress of business etc."

Three Simple Definitions

- Communication means sharing of information
- Communication is the giving and receiving of messages
- Communication is the transfer of information from one or more people to one or more other people

MEANING OF COMMUNICATION

The term communication is derived from the latin word "communis" or "communicare" which means to make common. Thus communication means to make common facts, information's, thoughts and requirements. Communication therefore is the exchange of thoughts, message, information etc. by way of speech, signal or in writing.

Communication is two way process and works well with feedback, this helps to confirm that intended message has been successful.

SCHOLAR DEFINITION OF COMMUNICATION

In order to understand further, many scholars has define the term such as Communication is the sum of all things, one person does when he wants to create understanding in the minds of another. It involves a systematic and continuous process of telling, listening and understanding."

– Allen Louis

Communication has been defined "As the transfer of information from one person to another whether or not it elicits confidence."

– Koontz and O' Donell

"Communication is an exchange of facts, ideas, opinions or emotions by two or more persons."

– George Terry

"Communication is the process by which information is transmitted between individuals and/or organization so that an understanding response results".

– By Peter Little

"Communication is an exchange of facts, ideas, opinions or emotions by two or more persons".

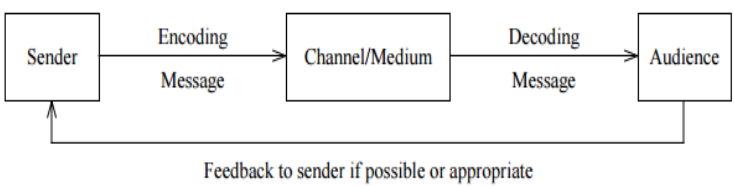
– By W.H. New man and C.F. summer Jr.

Here are many other comprehensive definition exist and touches all the aspects of communication process in general terms such as business communication, Organizational communication etc.

"Administrative communication is a process which involves the transmission and accurate replication of ideas ensured by feedback for the purpose of eliciting actions, which will accomplish organizational goals."

PROCESS OF COMMUNICATION

Communication is effective when a concise and clear message is delivered well, received successfully and understand fully. The process of communication has the following distinct components:



Communication Process

Communication begins with an impulse (or motivation) to pass on a message made up of bits of information. In the process of encoding, units of information are selected and organized for transmission. Input is the sum of experiences that build up in the human brain or computer. Output is the encoded message transmitted by the information source (an individual person or group of people). The interpretation of the message is referred to as decoding. Feedback is the response, or message that the recipient (decoder) returns to the sender (encoder).

- Sender has an idea
- Sender encodes the idea
- Sender transmits the message through medium
- Receiver gets the message
- Receiver decodes the message

- Receiver sends feedback

Feedback in the communication process is the response that gives us some indication of how effectively we communicate. It is the gauge of efficiency in communication

CLASSIFICATION OF COMMUNICATION

Based on whom the message is addressed

We classify communication according to the number of persons (receivers) to whom the message is addressed:

- ***Intrapersonal Communication:***
  It is talking to oneself in one's own mind. Examples are soliloquies or asides in dramatic works.
- ***Interpersonal Communication:***
  It is the exchange of messages between two persons. For example, a conversation, dialogue, or an interview in which two persons interact (others may also be present as audience). An author communicates interpersonally with his reader, who is always present as a silent audience in the author's mind while he writes. A letter too is an example of interpersonal communication between the writer and the person to whom it is written.
- ***Group Communication:***
  It can be among small or large groups, like an organization, club or classroom, in which all individuals retain their individual identity.
- ***Mass Communication:***
  It occurs when the message is sent to large groups of people, for example, by newspaper, radio, or television. In this process, each person becomes a faceless individual with almost no opportunity for personal response or feedback.

Based On the basis of the medium employed

- **Verbal Communication:**
  It means communicating with words, written or spoken. Verbal communication consists of speaking, listening, writing, reading, and thinking. It may further be classified as Oral or Written Communication.
- **Non-verbal communication:**
  It includes using of pictures, signs, gestures, and facial expressions for exchanging information between persons. It is done through sign language, action language, or object language. Non-verbal communication flows through all acts of speaking or writing. It is a wordless message conveyed through gestures (sign), movements (action language), and object language (pictures/clothes) and so on. Further non-verbal communication can be identified by personal space (proxemics), sense of smell (olfactics) and time (chronemics).
- **Meta Communication:**
  Here the speaker's choice of words unintentionally communicates something more than what the actual words state. For example, a flattering remark like "I've never seen you so smartly dressed" could also mean that the regular attire of the listener needed improvement.
- **Formal Communication:**
  A formal channel of communication can be defined as a means of communication that is formally controlled by managers or people occupying positions in an organization. The communication flows through formal channels, that is, officially recognized positions along the line in the organization. This ensures that the information flows orderly, timely, and accurately. Any information, decision, memo, reminder etc. will follow this path.
- **Informal Communication:**
  Side by side with the formal channel of communication every organization has an equally effective channel of communication that is the informal channel. It is not officially sanctioned, and quite often it is even discouraged or looked down upon. But, then, it is very much there, and has been given the name 'grapevine' precisely because it runs in all directions-horizontal, vertical, diagonal. As the management experts put it, "it flows around water coolers, down hallways, through lunch rooms, and wherever people get together in groups".
- **Downward Communication:**
  The Communication that flows from Top to Bottom is known as downward communication. Any organization has an inbuilt hierarchical system, and in that, in the first instance, communication invariably flows downwards.
- **Upward Communication:**
  The Communication that flows from bottom to top, which is from lower hierarchical level to higher level, is called Upward Communication. The main function of upward communication is to supply information to the upper levels about what is happening at the lower levels. It is just the reverse of the previous dimension
- **Lateral Communication:**
  When communication takes place between two or more persons who are subordinates working under the same person, or those who are working on the same level, it is called lateral or horizontal communication. A good example of this kind of communication is that between functional managers. It is necessary for the reviewing of the activities assigned to various subordinates having identical positions
- **Diagonal Communication:**
  Diagonal or Crosswise communication includes flow of information among persons at different levels who have no direct reporting relationships. As an example, the Communication between the Training Supervisor and Marketing Manager, regarding the Training of a few employees of Marketing Department, is Diagonal Communication. This kind of

communication is used to speed up information flow, to improve understanding, and to coordinate efforts for the achievement of organizational objectives.

OBJECTIVES/PURPOSE OF COMMUNICATION

The objectives of communication are dynamic and ever-changing. Some of the common objectives of official communication are to get or give information, to ask for or give instructions or advice or suggestions, to make requests, to persuade other people to agree with us. Sometimes, we communicate with the intention of complaining, or warning; but unfortunately, we do this angrily and get into arguments. If we learn to complain and warn in an acceptable and constructive manner, our serious intention can be conveyed quite effectively without damaging relationships. In order to caution, counsel, clarify, apprise, evaluate, reprimand, organize and numerous such objectives, we make use of communication.

EVALUATION OF COMMUNICATION EFFECTIVENESS

Communication is not an end in itself; rather it is a means to attain other ends or goals. Hence, it has to be effective to be able to attain these goals or objectives. Communication effectiveness can be examined in relation to the following criteria:

- Fidelity of Communication: the distortion free quality of a message is called fidelity. An effective person gets the message across to others with minimal possibilities of misunderstanding.
- Economy: In an effective communication a minimum of energy time, symbols and cues are used to encode message without losing its fidelity and impact.
- Congruence: An effective communication integrates both verbal and non-verbal cues.
- Influence: The most important criterion of effectiveness is the influence that the communicator is able to exercise over the receiver of the communication. Influence means the communicator achieve the results he intended.
- Relationship Building: An effective communication contributes to the building of trust and better relationship between the source and the target.

SEVEN C's OF EFFECTIVE COMMUNICATION:

These are the Seven terms, starting with the letter C, which make communication more understandable, valuable and effective.

-Consideration
-Courtesy
-Clarity
-Correctness
-Concreteness
-Conciseness
-Completeness

FOUR S's OF COMMUNICATION:

Four terms starting with letter S, which add to the value of the message in Communication

- Sincerity
- Simplicity
- Shortness
- Strength

THEORIES AND MODELS OF COMMUNICATION

There are different ways to understand the principles and processes that define communication. The convenient and easy ways from these is through models, as they act as a descriptive tools to approximate things, which otherwise would have trouble seeing, imagining or describing.

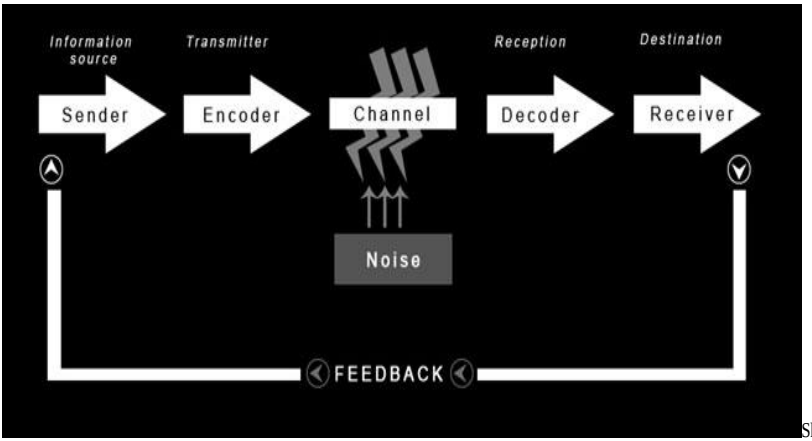
The models of communication:

- One way communication process: Linear model
- Two way process
- Shannon Weaver model of communication
- Murphy's model of Communication
- Berlo's model of Communication
- Thill and Bovee's Model

Over the years, numerous models have been offered as representations of what is involved when human communicate. Different scholars have put forward different models of communication, main among them are: –

SHANNON- WEAVER MODEL

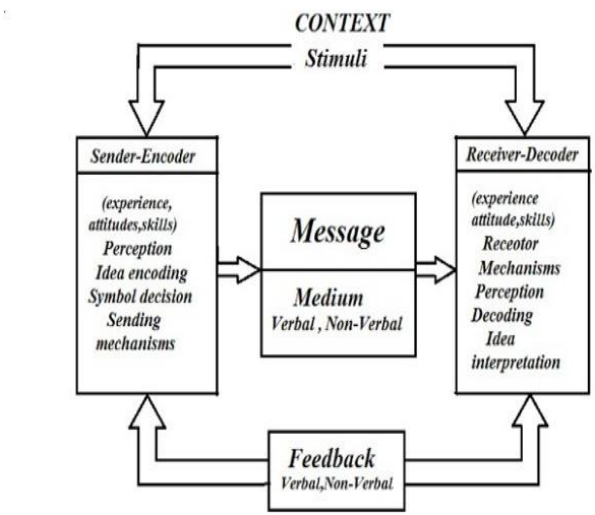
In the year 1949 Cloude Shannon, an electrical engineer and Warren Weaver propounded a mathematical model of communication. This model particularly explains electronic communication in a simple linear way which is easily understandable.



Shannon-Weaver-Model-with-Feedback-UGC-NET-Communication

a). Information Source: – It is the beginning of the process. It represents some purpose on the part of sender.
b). Message: – It is the information passing between sender and receiver in the communication process.
c). Transmitter: – The sender of message is an encoded form is known as transmitter.
d). Noise Source: – The model recognizes the potential of noise in distorting the message while transfer through channel.
e). Reception: – He is the person to whom information is send. He decodes the information.
f). Destination: – It is the end of the communication process.

MURPHY'S MODEL:



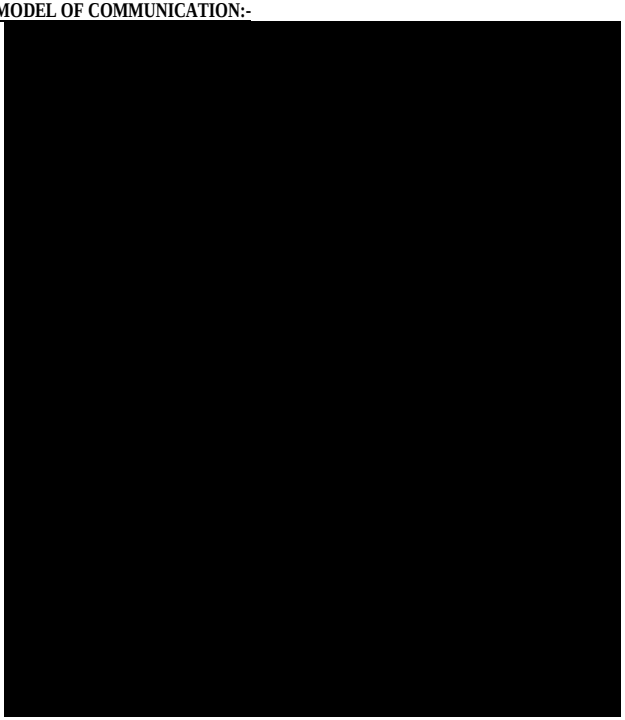
Different Communication models, Murphy model of Communication for UGC NET

This communication process model is propounded by three writers. According to this model; there are six components of communication process : –

a). Context: – Context is a broad field that includes country, culture, organization, internal & external cause of action and every message weather oral or written begins with context.
b). Sender-Encoder: – The second- encoder used symbols, usually words, to express the message and create desired response.
c). Message: – The message is the core idea the sender wishes to communicate. It consists of both verbal and non-verbal symbols.
d). Medium: – It is the channel through which a message is communicated. It can be printed word, e – mail, sound or gesture.

e). Receiver- decoder: – The receiver/listener is the person who receives the message and decodes it.
f). Feedback: – It can be oral or written. It can be an action such as receiving an ordered item. Sender needs feedback in order to determine the success or failure of the communication.

BERLO'S SMCR MODEL OF COMMUNICATION:-



In 1960, David Berlo postulated Berlo's Sender-Message-Channel-Receiver (SMCR) model of communication from Shannon Weaver's Model of Communication (1949). He described factors affecting the individual components in the communication making the communication more efficient.

The model also focuses on encoding and decoding which happens before sender sends the message and before receiver receives the message respectively.

Berlo's Model has mainly, four components to describe the communication process. They are sender, message, channel and receiver. Each of the component is affected by many factors.

Components of Berlo's Model of Communication

S -SENDER SOURCE

Sender is the source of the message or the person who originates the message. The person or source sends the message to the receiver. The following are the factor related to sender and is also the same in the case of receiver.

Communication Skills

Communication skills of a person are a factor that affects the communication process. If the sender has good communication skills, the message will be communicated better than if the sender's communication skills are not good. Similarly, if the receiver cannot grasp the message, then the communication will not be effective. Communication skills include the skills to speak, present, read, write, listening, etc.

Attitude

The attitude of the sender and the receiver creates the effect of the message. The person's attitude towards self, the receiver and the environment changes the meaning and effect of the message.

Knowledge

Familiarity with the subject of the message makes the communicated message have its effect more. Knowledge on the subject matter makes the communicator send the message effectively.

Social Systems

Values, beliefs, laws, rules, religion and many other social factors affect the sender's way of communicating the message. It creates difference in the generation of message. Place and situation also fall under social systems.

Culture

Cultural differences make messages different. A person from one culture might find something offensive which is very much accepted in another culture.

M-MESSAGE

A message is the substance that is being sent by the sender to the receiver. It might be in the form of voice, audio, text, video or other media. The key factors affecting the message are

Content

Content is the thing that is in the message. The whole message from beginning to end is the content.

Elements

Elements are the non verbal things that tag along with the content like gestures, signs, language, etc.

Treatment

Treatment is the way in which the message is conveyed to the receiver. Treatment also affects the feedback of the receiver.

Structure

The structure of the message or the way it has been structured or arranged, affects the effectiveness of the message.

Code

Code is the form in which the message is sent. It might be in the form of language, text, video, etc.

C-CHANNEL

Channel is the medium used to send the message. In mass communication and other forms of communication, technical machines might be used as a channel like telephone, internet, etc. But in general communication, the five senses of a human being is the channel for the communication flow and it affects the effectiveness of the channel.

Hearing - We receive the message through hearing.

Seeing - We perceive through seeing. We also get non-verbal messages by seeing.

Touching - Many of the non-verbal communication happens from touching like holding hands.

Smelling - We collect information from smelling.

Tasting - Taste also provides the information to be sent as a message.

R- RECEIVER

Receiver is the person who gets the message sent in the process. This model believes that the thinking pattern and all other factors mentioned above must be in sync to that of the sender for the communication to be effective. The message might not have the same effect as intended if the receiver and sender are not similar. The receiver must also have a very good listening skill. Other factors are similar to that of the sender.

Communication skills

Attitudes

Knowledge

Social Systems

Culture

Criticisms of Berlo's SMCR Model:

- There is no concept of feedback, so the effect is not considered.
- There is no concept of noise or any kind of barriers in communication process.
- It is a linear model of communication, there is no two way communication.
- Both of the people must be similar according to all the factors mentioned above.

THILL AND BOVEE MODEL: –

According to Thill and Bovee communication model, business communication is more than a single act. It is a chain of events consisting of five phases linking sender and receiver.

a). **Idea:** – The sender has an idea. In the process of conceiving an idea about the real world, the sender leaves out many things but assumes some things. This means idea in the mind of sender is a simplification of the real world.

b). **Message:** – The idea in the mind of sender is transformed into words and thus becomes a message. The message may be expressed in many ways.

c). **Message is transmitted:** – The 3rd step in the process is physical transmission of the message through verbal or non-verbal channel, from sender to receiver.

d). **Receiver gets Message:** – For communication to occur, the receiver has to get the message, and understand the message and store the message mentally.

e). **Feedback:** – The receiver reacts after receiving the message and sends feedback. Feedback is a key element in the communication process because it enables the sender to evaluate the effectiveness of the message. Then the process is repeated until both parties have finished expressing themselves.

BARRIERS TO COMMUNICATION

Communication is not always successful. Certain barriers in communication affect the clarity, accuracy and effectiveness of the message. These barriers hamper the growth of communication and relegate it to the status of a conversation where feedback is not expected.

If either the speaker or the listener has problems in adjusting his frequency with the co-interactants, barriers would automatically be erected.

Several things can prevent the message from reaching the intended recipient or from having the desired effect on the recipient. There may be some fault in the communication system which may prevent the message from reaching. Some of these defects are in the mechanical devices used for transmitting, that is, the medium; some are in the tools we use for communicating, that is, language or other symbols used for encoding; Some are related to the sender or the receiver.

As the barriers to communication influence the major variables in the communication process, they may be categorized on various bases. Though the list of Barriers is exhaustive and there are many ways in which the Barriers can be categorized, one of the oldest categorization of barriers is stated below:

1. **Semantic barriers:** Different people assign different meanings to one specific message. This is due to the problems with meaning, significance, and the sending and reception of the meaning and content of the massage.
2. **Organizational barriers:** This type of barrier develops due to the problems with physical distance between members with respect to their functional specialization of tasks, power, authority and status relationship, values held, and ownership of information.
3. **Interpersonal barriers:** These barriers also develop in the process of communication. They are based upon the relationships, values held, and attitudes of the participants in the process of communication.
4. **Individual barriers:** These are also called psycho-sociological barriers. The problem of this barrier arises due to differences in individual competencies to think and act, which would include physical ailments or handicaps. It is also because of individual skills in receiving and transmitting information, which would include poor listening and improper reading skills and adverse psychological conditions.
5. **Cross Cultural (geographic) barriers:** Culture is a shared set of values and attributes of a group. The communication barriers are also seen because of time, geographic locations, and the effects of time upon reception of the message and other cross cultural factors.
6. **Physical Barriers/Channel and media barriers:** The effectiveness and accuracy of communication is also affected by the physical barriers like distance, noise or channel and the media used in the process. In this category, problems that confront the media used in the process. In this category, problems that confront the issue of how best to communicate a message are included. (For example, it is best to transmit a massage face to face rather than in writing).
7. **Technological barriers:** They are barriers which arise due to technological advancements in the field of communication. Technology generates lot of information, which is beyond the capacity of the recipient. Further, the media advancements on account of technological process increase the barriers. The ideas and massage have to reach from the transmitter to receive in the same sense. If it does not happen, it is on account of barriers in communication.

OVERCOMING COMMUNICATION BARRIERS: –

Following points should be kept in mind in order to overcome different communication barriers:

1). Constructive environment should be created for expression of ideas.

2). Proper communication channel should be used to transfer idea/information.

3). One should try to maintain a positive attitude while communicating by being open minded.

4). One should use direct, simple language and avoid words that have more than one meaning.

5). Free flow of information should take place between different levels both vertically and horizontally.

6). One should try to understand the idea/information through proper listening before giving feedback.

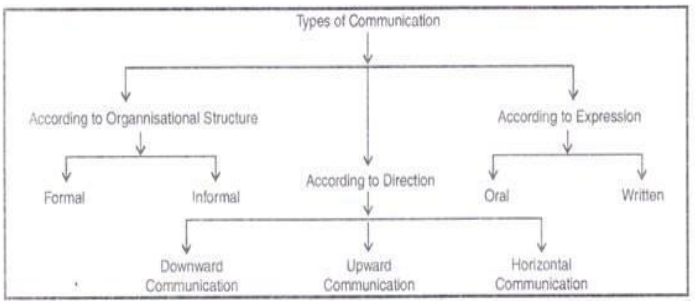
ORGANIZATIONAL COMMUNICATION

A. Communication According to Organizational Structure:

1. Formal Communication:

Such a communication is that which is associated with the formal organisation structure and the official status or the position of the communicator and the receiver. It travels through the formal channels officially recognised positions in the organisation chart. Formal communication is mostly in black and white.

hus, it is a deliberate attempt to regulate the flow of communication so as to ensure that information flows smoothly, accurately and timely. Formal communication is a deliberate attempt to regulate the flow of communication so as to ensure that information flows smoothly, accurately and timely.



Types of Communication

We frequently come across the phrase 'through proper channel'. It emphasises the essence of formal channel of communication. For example, when the General Manager issues instructions (because of his senior position in the organisation), it is formal communication.

The forms of formal communication are as under:

(i) Departmental meetings,
(ii) Conference,
(iii) Telephone calls,
(iv) Company news bulletins,
(v) Special interviews and special purpose publications and messages.

The main advantage of the formal communication is that the official channels enable the routine and standardised information to pass without claiming much of managerial attention. Essentially, executives and managers may devote most of their precious time on matters of utmost significance.

But at the same time, the weakness of formal communication should not go unaccounted. Communication through channel of command greatly obstructs free and uninterrupted flow of information.

2. Informal Communication:

Informal communication is also known as 'Grapevine'. It is free from all sorts of formalities because it is used on informal relationships between the parties, such as friendship, membership in the same club or association.

Persons at the executive levels also use informal communication when they find it difficult to collect information from the workers. Such communication includes comments, suggestions etc. It may be conveyed by a simple glance, gesture, smile or mere silence.

Managers and executives also favour the growth and development of informal network of communication off and on. This process, In fact, serves a very useful purpose in disseminating certain information which, in the general interest of the organisation, cannot be transmitted through the official channels.

Apart from that, it also offers the high and higher ups a clearer insight into what the subordinates think and feel. But at the same time, the weaknesses of the informal communication are also worth noting. It may be mentioned that this process very often tends to pass distorted, misinterpreted, and inaccurate and half- truth information and facts, depending on the circumstances and the message. But still, executives and managers cannot do away with informal communication.

B. Communication According to Direction:

1. Downward Communication:

Communication which flows from the superiors to subordinates is referred to as downward communication. In an organisational structure, the executives must exercise their powers to achieve the desired objectives which imply that they may be engaged in issuing orders, instructions and policy directives to the persons at the lower levels. This may be called downward communication. Under downward communication, immediate performance of a job is expected.

Katz And Kahn Have Identified Live Elements of Downward Communication:

1. Specific task directives; Job instructions.
2. Information designed to produce understanding of the task and its relation to other organisational tasks; job rationale.
3. Information about organisational procedures and practices.
4. Feedback to the subordinate about his performance.
5. Information of an ideological character to inculcate a sense of mission, indoctrination of goals.

Communication from superior to subordinate can be face to face as well as through written memos, orders, job descriptions etc.

2. Upward Communication:

In an upward communication, the persons from the lower level are expected to have communication with those who are above them. It is just the reverse of downward communication. This sort of communication includes reactions and suggestions from workers, their grievances etc. Contents of upward communication are reports, reaction, suggestion statements and proposals prepared for the submission to the boss.

Upward Communication can be divided into four categories on the basis of what employee says:

(i) about himself, his performance and problems,
(ii) about others and their problems,

(iii) about organisational policies and practices, and
(iv) about what needs to be done and how it can be done.

The main features of upward communication are:

(1) it is condensed and summarised as it passes through various levels in the hierarchy. It gives feedback on the extent of effectiveness of downward communication. This feedback is used for improving communication effectiveness.
(2) It provides the management about the viewpoints, reactions, attitudes, feelings and morale of employees.
(3) It provides means of control.
(4) Finally, it gives information and date for decision making.

Upward communication may get distorted owing to the nature of superior- subordinate relationships. An employee is not likely to give any information which may affect him adversely. Moreover, he may transmit wrong information to impress his superiors. It flows through many media e.g. chain of command, suggestion boxes, personal contacts, attitude and morale surveys, grievance procedure, private lines, labour unions etc.

3. Horizontal Communication:

When the communication takes place between two or more persons who are subordinates of the same person or those who are working on the same level of organisation, the communication is known as horizontal (lateral) communication.

The communication between functional managers or among subordinates working under one boss, the communication between managers of various factories is the examples of such communication. Horizontal communication may be oral as well as written.

Horizontal Communication satisfies peoples' needs to know from their own peers without taking into account other levels in the organisation. It is really difficult for an organisation to function efficiently without such horizontal communication flows. Although the formal organisation design does not provide for such communication flows, it is needed for the coordination and integration of diverse organizational functions.

Since organizational horizontal communication ordinarily do not exist in facilitation is left to individual managers. Peer to peer communication necessary for co-ordination and can also provide social need satisfaction.

C. According to Way of Expression:

1. Oral or Verbal Communication:

Oral communication is a direct communication between two individuals. In oral communication both the parties i.e., sender and receiver exchange their ideas through oral words either in face to face conversation or through any mechanical or electrical device such as telephone, teleconference etc. When it is face to face, the person communicating can ask questions or explanations or sometimes when the communication is not properly understood, he can clarify meaning.

Oral communication is generally possible where there can be either a direct contact or message to be conveyed is not of permanent nature. Meetings and conferences, lectures and interviews are other media of such communication.

Oral communication enjoys certain advantages communication which may be enumerated as follows:

(i) Oral communication has the distinct advantage of being quick and prompt. It provides the opportunity to both the transmitter and receiver of the message to respond directly.
(ii) Oral communication facilitates close contact and thus fosters mutual exchange of ideas, facts, understanding and cooperation.
(iii) Oral communication through direct contact undoubtedly inculcates in the subordinates a sense of self-importance which in turn acts as a motivating factor.
(iv) Oral communication further enables the superior to make a quick appraisal of subordinate's action and reaction to any message transmitted. This obviously helps the superior to minimize and avert conflicts, redesign plans and programmes according to the need of time and circumstances.
(v) The personality of the communicator is brought to bear in the communication process. This has good effect on the subordinates and they understand the communication properly.
(vi) It can bring a friendly and co-operative team spirit.

However, the following are the disadvantages of the oral communication:

(i) There is a possibility that the spoken words may not be clearly heard or understood.
(ii) It is not good for lengthy communications.
(iii) It requires the art of expressing accurately and appropriately, and listen to others emphatically.
(iv) It is inadequate where specific performance of policies and rules is needed.
(v) The inexperienced subordinates do not follow the facial expressions and the tone of manager's voice.

2. Written Communication:

When the communication is reduced to black and white (writing), it is called written communication. This includes written words, graphs, diagrams, pictures, etc. Written communications are extensively used in organizations.

Sometimes, this form of communication becomes indispensible as in the case of rules, orders, schedules or policy matters etc. The circulars, magazines, notes and manuals are some common forms of written communication.

It may be asserted from general observations that in all types of organisations both oral and written communication is in practice. Which form should be used and applied? Much depends on the message, its importance to receiver, and implication to functional aspects of the organization.

The Following List Presents Some Commonly Used Forms of Communication in Different Directions:

Oral	Written
(1) Personal instructions.	(1) Rules and instructions handbook.
(2) Lectures, conferences, meetings.	(2) Letters, circulars and memos.
(3) Grapevine rumours.	(3) Posters.

(4) Interviews. (5) Face to face conversation. (6) Telephone etc. (7) Union channels.	(4) Bulletin and notice Boards. (5) Handbooks and Manuals. (6) Annual Reports. (7) House Magazines. (8) Union Publications. (9) Personal letters and suggestions. (10) Complaint Procedure.

FORMAL COMMUNICATION CHANNELS

Introduction

In an organization, information flows forward, backwards and sideways. This information flow is referred to as communication. Communication channels refer to the way this information flows within the organization and with other organizations.

In this web known as communication, a manager becomes a link. Decisions and directions flow upwards or downwards or sideways depending on the position of the manager in the communication web.

For example, reports from lower level manager will flow upwards. A good manager has to inspire, steer and organize his employees efficiently, and for all this, the tools in his possession are spoken and written words.

For the flow of information and for a manager to handle his employees, it is important for an effectual communication channel to be in place.

The Working of a Communication Channel

Through a modem of communication, be it face-to-face conversations or an inter-department memo, information is transmitted from a manager to a subordinate or vice versa.

An important element of the communication process is the feedback mechanism between the management and employees.

In this mechanism, employees inform managers that they have understood the task at hand while managers provide employees with comments and directions on employee's work.

Importance of a Communication Channel

A breakdown in the communication channel leads to an inefficient flow of information. Employees are unaware of what the company expects of them. They are uninformed of what is going on in the company.

This will cause them to become suspicious of motives and any changes in the company. Also without effective communication, employees become department minded rather than company minded, and this affects their decision making and productivity in the workplace.

Eventually, this harms the overall organizational objectives as well. Hence, in order for an organization to be run effectively, a good manager should be able to communicate to his/her employees what is expected of them, make sure they are fully aware of company policies and any upcoming changes.

Therefore, an effective communication channel should be implemented by managers to optimize worker productivity to ensure the smooth running of the organization.

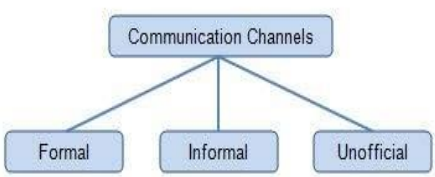
Types of Communication Channels

The number of communication channels available to a manager has increased over the last 20 odd years. Video conferencing, mobile technology, electronic bulletin boards and fax machines are some of the new possibilities.

As organizations grow in size, managers cannot rely on face-to-face communication alone to get their message across.

A challenge the managers' face today is to determine what type of communication channel should they opt for in order to carryout effective communication.

In order to make a manager's task easier, the types of communication channels are grouped into three main groups: formal, informal and unofficial.



Formal Communication Channels

- A formal communication channel transmits information such as the goals, policies and procedures of an organization. Messages in this type of communication channel follow a chain of command. This means information flows from a manager to his subordinates and they in turn pass on the information to the next level of staff.
- An example of a formal communication channel is a company's newsletter, which gives employees as well as the clients a clear idea of a company's goals and vision. It also includes the transfer of information with regard to memoranda, reports, directions, and scheduled meetings in the chain of command.

- A business plan, customer satisfaction survey, annual reports, employer's manual, review meetings are all formal communication channels.

Informal Communication Channels

- Within a formal working environment, there always exists an informal communication network. The strict hierarchical web of communication cannot function efficiently on its own and hence there exists a communication channel outside of this web. While this type of communication channel may disrupt the chain of command, a good manager needs to find the fine balance between the formal and informal communication channel.
- An example of an informal communication channel is lunchtime at the organization's cafeteria/canteen. Here, in a relaxed atmosphere, discussions among employees are encouraged. Also managers walking around, adopting a hands-on approach to handling employee queries is an example of an informal communication channel.
- Quality circles, team work, different training programs are outside of the chain of command and so, fall under the category of informal communication channels.

Unofficial Communication Channels

- Good managers will recognize the fact that sometimes communication that takes place within an organization is interpersonal. While minutes of a meeting may be a topic of discussion among employees, sports, politics and TV shows also share the floor.
- The unofficial communication channel in an organization is the organization's 'grapevine.' It is through the grapevine that rumors circulate. Also those engaging in 'grapevine' discussions often form groups, which translate into friendships outside of the organization. While the grapevine may have positive implications, more often than not information circulating in the grapevine is exaggerated and may cause unnecessary alarm to employees. A good manager should be privy to information circulating in this unofficial communication channel and should take positive measures to prevent the flow of false information.
- An example of an unofficial communication channel is social gatherings among employees.

PROS AND CONS OF ORGANIZATION COMMUNICATION

Upward Communication

Upward communication originates from the subordinate level and continues to flow up to the organizational hierarchy to those superior in the organization. It is an upward flow of information from employees at the operational level to top executives. Upward communication can occur through suggestion systems, appeal and grievance procedures, group meetings, the practice of an open-door policy, morale questionnaires and exit interviews.

In order to promote effective upward communication, the upper level of management must create a working environment in which subordinates feel at liberty to communicate.

Pros and Cons of Upward Communication

Pros:

- Managers can obtain specific knowledge about every situation in the organization. This type of communication assists management in comprehending the performance of employees, the problems of employees, and the results of decisions they have made.
- Upward communication helps the organization to implement innovative techniques developed by the lower level employees.
- Employees are enthusiastic because they feel they are an essential part of the organization.
- The process of upward communication is facilitated as good listening becomes a two-way channel.

Cons:

- Employees hesitate to communicate bad news for fear that it will make them appear incompetent.
- The valuable time of superiors may be wasted in listening to trivial matters of subordinates.
- Superiors often listen only to what they feel is important and may be ignoring other important information.
- Superiors are often too busy to listen to subordinates.

Downward Communication

Communication that streams from employees at higher levels to those at lower levels in the organizational chain of command is referred to as downward communication. Oral downward communication may take place by means of instructions, meetings, the telephone, loudspeakers and even the grapevine. Written downward communication engages the use of memorandums, letters, handbooks, pamphlets, and policy and procedure statements.

Pros and Cons of Downward Communication

Pros:

- Assists employees in gaining support from their superiors by providing job instructions, rationale and feedback.
- Makes employees aware of the organization’s policies, procedures, objectives and programs.
- Facilitates understanding of employees’ responsibilities and helps them achieve their goals.

Cons:

- It is a time-consuming process that may frustrate top level managers.
- Lack of knowledge on the part of the subordinates may cause misunderstandings and create conflicts.
- The message may lose its accuracy because it becomes complicated. Lack of trust between superiors and subordinates can cause the message to become distorted.

Horizontal Communication

Horizontal flow refers to the flow of information among employees at the same or similar organizational levels, who have no direct reporting relationships. It can take place orally during informal meetings or over lunch. It can also take place during formal conferences and board meetings. The company newsletter and bulletin board notices are the usual mediums for the written form of horizontal communication.

Pros and Cons of Horizontal Communication

Pros:

- Facilitates understanding between employees at same hierarchical level by allowing them to share information to achieve organizational goals.
- Assists in solving conflicts among employees working in a department.
- Provides social, psychological and emotional support to each other.

Cons:

- Since the horizontal form of communication does not follow any particular chain of commands, problems may arise between employees at various levels and between various departments of the organization.
- May waste time on matters that are unproductive.
- May cause disharmony among employees as too much personal information is shared.

EFFECTIVE CLASSROOM COMMUNICATION

Classroom communication exists in three categories: verbal, nonverbal and written. Verbal communication means anything that a teacher or student speaks aloud. Nonverbal communication refers to body language that people express. Written communication is writing directed at a specific audience, such as report card comments or student assignments. Teachers and students interact with one another in many different contexts, and use all three of these types of communication.

Teacher/Class Communication

Teacher/class communication exists when a teacher communicates with his entire class. Verbal communication exists when a teacher tells students information they need to know. For example, if a teacher asks a student to "stop talking," this is a direct form of verbal communication. There are ways for teachers to communicate nonverbally with their classes, such as through their posture, gesticulations and proximity to the students. Instead of telling a student to stop talking, a teacher could use nonverbal communication by moving toward the disruptive student's desk. Not only does the disruptive student receive the message, but other students in the class who observe the intervention receive it as well. Written instructions for an assignment are given from the teacher for the whole class.

Teacher/Student Communication

Teacher/student communication occurs when a teacher interacts directly with a particular student. Since a teacher interacts with her students mostly in front of the whole class, it can be difficult to distinguish teacher/student communication from teacher/class communication. Teacher/student communication requires that the teacher act one-on-one with a student, such as in a conference during class activities, before or after class or after school. This type of communication is effective for teachers who want to communicate a private message, such as a talk about constant inappropriate behavior or about taking more of a leadership role in class.

Student/Teacher Communication

Student/teacher communication is also direct communication between a student and the teacher, but this time it is the student who initiates the conversation. Also, this can occur during whole-class participation. For example, a student who asks a teacher a question during class discussion engages in student/teacher communication because it is a single student communicating with a single teacher. The reason the reverse situation constitutes teacher/class communication and not teacher/student is that the teacher's actions and messages are directed toward the whole class while the student's questions here are only directed at the teacher. When students write emails to their teacher on graded assignments, this constitutes a written form of student/teacher communication.

Student/Student Communication

Student/student communication occurs when two or more students interact with one another. Successful whole-class discussion stimulates student/student communication because students should talk to each other and not just to the teacher. Two students may disagree and talk back and forth to each other during such discussions. Student/student communication also occurs when students work in groups or pairs to complete assignments.

Student/Class Communication

Student/class communication exists when a student or group of students direct their messages to the entire class. Whole-class discussion can also stimulate this type of communication. For example, if a student asks the class a question during a discussion, the student's message is directed at the entire class. Individual or group presentations also constitute student/class communication, and it is this type of communication about which students feel most nervous or self-conscious. Nonverbal communication often includes fidgeting or looking away.

PRECIOUS YEARS SOLVED MCQ

1. Match List-I with List-II and choose the correct answer using the codes given below:

List-I (Distinguished Ladies)	List-II (Area of work)
(A) Jhumpa Lahiri	(i) Journalist
(B) Barkha Dutt	(ii) Novel Writing
(C) Aparna Sen	(iii) Film Actress
(D) Smita Patil	(iv) Film Director

Codes:

	(a)	(b)	(c)	(d)
(A)	(iv)	(iii)	(ii)	(i)
(B)	(ii)	(i)	(iv)	(iii)
(C)	(iv)	(i)	(iii)	(ii)
(D)	(ii)	(iii)	(iv)	(i)

Answer: B

Nilanjana Sudeshna "Jhumpa" Lahiri is an American author. Lahiri has been selected as the winner of the 29th PEN/Malamud Award for Excellence in the Short story. Barkha Dutt is an Indian television journalist. Aparna Sen is an Indian filmmaker, screenwriter and actress who is known for her work in Bengali cinema. Smita Patil was an Indian actress of film, television and theatre.

2. Which of the following pair is not correctly matched?

(A) Aajtaak - 24 hours news channel
(B) F.M. Stations - Radio
(C) National Geography channel - Television
(D) Vir Sanghvi - India Today

Answer: D

Vir Sanghvi (born 5 July 1956) is an Indian print and television journalist, columnist, and talk show host. He has been a member of many professional, academic and government bodies including the National Integration Council. Currently, he is a member of the Broadcast Content Complaint Council (BCCC), a body that regulates content on entertainment TV channels and Co-Founder/Lead Food Critic at EazyDiner.

3. Which is the oldest soap opera telecasted in India?

(A) Kahani Ghar Ghar Ki
(B) Buniad
(C) Humlog
(D) Saas Bhi Kabhi Bahu Thee

Answer: C

Hum Log (English: We People) was Indian television's first soap opera and also the first serial drama series on India. It began telecast on Doordarshan, India's national network on 7 July 1984, then the only television channel of India.

A soap opera or soap, is a serial drama on television or radio that examines the lives of many characters, usually focusing on emotional relationships to the point of melodrama. The term soap opera originated from such dramas in the past being typically sponsored by soap manufacturers..

4. Which satellite channel uses the adline, "Knowing is everything"?

(A) BBC World
(B) Star
(C) Sony
(D) Zee

Answer: A

5. Which is the "First made in India" Kids channel of television?

(A) Cartoon Network
(B) Walt Disney
(C) United Home Entertainment's Hungama TV
(D) Nick Jr.

Answer: C

6. Level C of the effectiveness of communication is defined as:

(A) Channel noise
(B) Semantic noise
(C) Psychological noise
(D) Source noise

Answer: A

The Shannon-Weawer Model

According to Shannon and Weawer, the communication process presents problems at three different levels:

Level A. The Technical Problem

It is concerned with the accuracy of transference of symbols of communication from sender to receiver, the accuracy depending on the technical efficacy of the medium (e.g. a telephone set) and of the channel (e.g. a telephone cable).

Level B. The Semantic Problem

It is concerned with identity or satisfactorily close approximation of the intended meaning of the sender and the interpretation of meaning by the receiver.

Level C. The Effectiveness Problem

It is concerned with the extent to which the received meaning affects the conduct of the receiver in the way desired by the sender.

Level C involves the effectiveness problem where we find out how effectively the message is delivered and how the message is decoded. This problem only arises due to the source of communication such as transferring message through phones can create technical issue while communication.

7. Recording a television programme on a VCR is an example of:

(A) time-shifting
(B) Content reference
(C) Mechanical clarity
(D) Media synchronization

Answer: D

8. A good communicator is the one who offers to his audience:

(A) Plentiful of information
(B) A good amount of statistics
(C) Concise proof
(D) Repetition of facts

Answer: A

9. The largest number of newspapers in India is published from the state of:

(A) Kerala
(B) Maharashtra
(C) West Bengal
(D) Uttar Pradesh

Answer: D

Uttar Pradesh published the maximum number of newspapers in a single language i.e., 1608 in Hindi. Other states with notable number of language newspapers were Rajasthan 701 in Hindi, Delhi 594 in Hindi, Gujarat 741 in Gujarati, West Bengal 389 in Bengali, Madhya Pradesh 466 in Hindi and Maharashtra 312 in Marathi.

10. Which of the following statement is correct?

(A) Communicator should have fine senses
(B) Communicator should have tolerance power
(C) Communicator should be soft spoken
(D) Communicator should have good personality

Answer: A

Communicator should have fine senses by which he may able to select, encode, and communicate the communicative material

11. Communications bandwidth that has the highest capacity and is used by microwave, cable and fibre optics lines is known as:

(A) hyper-link
(B) Broadband
(C) Bus width
(D) Carrier wave

Answer: B

In telecommunications, broadband is wide bandwidth data transmission which transports multiple signals and traffic types. The medium can be coaxial cable, optical fiber, radio or twisted pair.

In the context of Internet access, broadband is used to mean any high-speed Internet access that is always on and faster than traditional dial-up access used for High speed fiber optic, microwave, satellite transmission

12. An electronic bill board that has a short text or graphical advertising message is referred to as:

(A) bulletin
(B) strap
(C) bridge line
(D) banner

Answer: D

13. A negative reaction to a mediated communication is described as:

(A) flak
(B) fragmented feedback
(C) passive response
(D) non-conformity

Answer: C

14. The function of mass communication of supplying information regarding the processes, issues, events and societal developments is known as:
(A) Content supply
(B) surveillance
(C) gratification
(D) correlation
Answer: A
15. The science of the study of feedback systems in humans, animals and machines is known as:
(A) Cybernetics
(B) Reverse communication
(C) Selectivity study
(D) Response analysis
Answer: A
Cybernetics is a transdisciplinary approach for exploring regulatory systems—their structures, constraints, and possibilities. Norbert Wiener defined cybernetics in 1948 as "the scientific study of control and communication in the animal and the machine." In the 21st century, the term is often used in a rather loose way to imply "control of any system using technology." In other words, it is the scientific study of how humans, animals and machines control and communicate with each other.
16. Networked media exist in inter-connected:
(A) social environments
(B) economic environments
(C) political environments
(D) technological environments
Answer: D
17. The combination of computing, telecommunications and media in a digital atmosphere is referred to as:
(A) Online communication
(B) Integrated media
(C) Digital combine
(D) Convergence
Answer: D
Growth in the information and technology (ICT) sector has exploded over the past 20 years. Dynamic market and technology developments have led to a phenomenon known as convergence, defined in this volume as the erosion of boundaries between previously separate ICT services, networks, and business practices.
18. A dialogue between a human-being and a computer programme that occurs simultaneously in various forms is described as:
(A) man-machine speak
(B) binary chat
(C) digital talk
(D) interactivity
Answer: D
The Psychology of Human-Computer Interaction, although the authors first used the term in 1980 and the first known use was in 1975. The term connotes that, unlike other tools with only limited uses (such as a hammer, useful for driving nails but not much else), a computer has many uses and this takes place as an open-ended dialog between the user and the computer. The notion of dialog likens human-computer interaction to human-to-human interaction, an analogy which is crucial to theoretical considerations in the field
19. 'SITE' stands for:
(A) System for International technology and Engineering
(B) Satellite Instructional Television Experiment
(C) South Indian Trade Estate
(D) State Institute of Technology and Engineering
Answer: B
20. Which one of the following can be termed as verbal communication?
(A) Prof. Sharma delivered the lecture in the class room.
(B) Signal at the cross-road changed from green to orange.
(C) The child was crying to attract the attention of the mother.
(D) Dipak wrote a letter for leave application.
Answer: A
21. Which is the 24 hours English Business news channel in India?
(A) Zee News
(B) NDTV 24×7
(C) CNBC
(D) India News
Answer: C

22. Consider the following statements in communication:
(i) Hema Malini is the Chairperson of the Children's Film Society, India.
(ii) Yash Chopra is the Chairman of the Central Board of Film Certification of India.
(iii) Sharmila Tagore is the Chairperson of National Film Development Corporation.
(iv) Dilip Kumar, Raj Kapoor and Preeti Zinta have all been recipients of Dada Saheb Phalke Award.

Which of the statements given above is/are correct?
(A) (i) and (iii)
(B) (ii) and (iii)
(C) (iv) only
(D) (iii) only
Answer No option is correct

i) Acclaimed film actress-cum-director Nandita Das will be next chairperson of the Children's Film Society of India (CFSI). The Chairperson of CFSI is selected for a duration of three years, and over the years, several notable personalities have remained Chairperson of CFSI including Sai Paranjpye (twice),Nafisa Ali (2005–2008), Nandita Das. (2008–2012) and presently, the position has been taken over by director-writer-actor, Amol Gupte, from 2012 onwards.
Mukesh Khanna: Chairperson, Children's Film Society of India (CFSI) Appointed in April this year after Amole Gupte, director of child-centric films like Stanley Ka Dabba and Hawaa Hawaai, resigned in June 2014. Khanna played the Indian superhero Shaktimaan.
Actor Mukesh Khanna 28 Feb 2018 said he has resigned as the chairperson of the Children's Film Society two months prior to the end of his term, alleging lack of support to take children's films to theatres and inadequate funding for the institution

ii) The Board consist of 25 other non-official members and a Chairperson (all of whom are appointed by Central Government). Prasoon Joshi currently presides the board, being appointed as the 28th Chairperson of the Board on 11 August 2017, after the ouster of Pahlaj Nihalani , who was preceded by Leela Samson who had resigned after the CBFC's rejection of a certificate for the film MSG: Messenger of God was overturned by an appellate tribunal. Earlier, Leela Samson had succeeded Sharmila Tagore, who was the longest continuous running Chairperson in the history. Nihalani was the 27th Chairperson after the Board's establishment. His appointment was highly controversial given his propensity for censoring films instead of merely certifying them.

iii) The National Film Development Corporation of India (NFDC) based in Mumbai is the central agency established in 1975, to encourage high quality Indian cinema. It functions in areas of film financing, production and distribution and under Ministry of Information and Broadcasting, Government of India. The primary goal of the NFDC is to plan, promote and organise an integrated and efficient development of the Indian Film Industry and foster excellence in cinema.
Film journalist and former editor of Filmfare, B. K. Karanjia remained the chairman of the NFDC for several years, he had been instrumental in the establishment of its predecessor, Film Finance Corporartion. Director Ramesh Sippy took over the position of chairman of NFDC in 2012. He replaced actor Om Puri who was appointed in 2008
Suresh Gopi to Replace Ramesh Sippy as NFDC Chairman in 2015

iv) Preeti Zinta never got Dada Saheb Phalke Award. Dadasaheb Phalke Award/Winners (2017) Kasinathuni Viswanath

23. Which of the following pair is not correctly matched?
(A) N. Ram: The Hindu
(B) Barkha Dutt : Zee News
(C) Pranay Roy: NDTV 24×7
(D) Prabhu Chawla: Aaj taak
Answer: B

24. "Because you deserve to know" is the punch line used by:
(A) The Times of India
(B) The Hindu
(C) Indian Express
(D) Hindustan Times
Answer: D

25. Which is the dress of the heroine in Veer-Zaara?
(A) Traditional Gujarati Clothes
(B) Traditional Bengali Clothes
(C) Traditional Punjabi Clothes
(D) Traditional Madras Clothes
Answer: C

26. Press Council of India is located at:
(A) Chennai
(B) Mumbai
(C) Kolkata
(D) Delhi
Answer: D

The Press Council of India is a statutory body in India that governs the conduct of the print media. It is one of the most important bodies that sustain democracy, as it has supreme power in regard to the media to ensure that freedom of speech is

maintained. However, it is also empowered to hold hearings on receipt of complaints and take suitable action where appropriate. It may either warn or censure the errant journalists on finding them guilty. It did so on 21st July 2006, when it censured three newspapers — Times of India (Delhi and Pune), Punjab Kesari (Delhi) and Mid Day (Mumbai) — for violation of norms of journalistic conduct. The Council's actions may not be questioned unless it is proved to be in violation of the constitution, which makes it an exceedingly powerful body.

Justice Chandramauli Kumar Prasad is Chairman of the Council as of 2015. The predecessor was Justice Markandey Katju (2011 – 2014).

27. Adjusting the photo for publication by cutting is technically known as:

(A) Photo cutting
(B) Photo bleeding
(C) Photo cropping
(D) Photo adjustment

Answer: C

28. Feed-back of a message comes from:

(A) Satellite
(B) Media
(C) Audience
(D) Communicator

Answer: C

29. Collection of information in advance before designing communication strategy is known as:

(A) Feed-back
(B) Feed-forward
(C) Research study
(D) Opinion poll

Answer: D

30. The aspect ratio of TV screen is:

(A) 4:3
(B) 4:2
(C) 3:5
(D) 2:3

Answer: A

The standard TV that's been around since the mid-50s has an aspect ratio of 4:3. That means the picture is 4 units wide for every three units of height. Meanwhile, the new HDTV standard is 16:9, which is 16 units of width for every 9 units of height.

December 2007

31. DTH service was started in the year:

(A) 2000
(B) 2002
(C) 2004
(D) 2006

Answer: C

The first DTH service in the country was launched by Dish TV on 2 October 2003. DD Free Dish, the first free DTH service in India, was launched by public broadcaster Prasar Bharati in December 2004.

32. National Press day is celebrated on:

(A) 16th November
(B) 19th November
(C) 21th November
(D) 30th November

Answer: A

33. The total number of members in the Press Council of India is:

(A) 28
(B) 14
(C) 17
(D) 20

Answer: A

The Press Council is headed by a Chairman: usually, a retired judge of the Supreme Court of India (except for the first chairman, Justice J. R. Mudholkar, who was a sitting judge of Supreme Court of India in 1968).It consists of a Chairman and 28 other members. Of the 28 members, 13 represent the working journalists. Of whom 6 are to be editors of newspapers and remaining 7(2members missing) are to be working journalists other than editors. 6 are to be from among persons who own or carry on the business of management of newspapers. One is to be from among the persons who manage news agencies. Three are to be persons having special knowledge or practical experience in respect of education and science, law and literature and culture. The remaining five are to Members of Parliament : three from Lok Sabha, and two from Rajya Sabha. The members serve on the Council for a term of three years. The Council was last reconstituted on 22 May 2001. The present Chairman is Justice Chandramauli Kumar Prasad.

34. The right to impart and receive information is guaranteed in the Constitution of India by Article:
(A) 19 (2) (a)
(B) 19(16)
(C) 19(2)
(D) 19(1) (a)
Answer: D

The Right to information is indisputably a fundamental right. It is a facet of "right to speech and expression" as provided in art 19(1) (a). Right to know has increased the efficiency of decision making process. It has set a transparency and determines accountability in the working of public department. Reduction in corruption in public department is due to the implementation of Right to Information Act, 2005.

35. Use of radio for higher education is based on the presumption of:
(A) Enriching curriculum based instruction
(B) Replacing teacher in the long run
(C) Everybody having access to a radio set
(D) Other means of instruction getting outdated
Answer: C

36. Communication with oneself is known as:
(A) Group communication
(B) Grapevine communication
(C) Interpersonal communication
(D) Intrapersonal communication
Answer: D

37. Which broadcasting system for TV is followed in India?
(A) NTSE
(B) PAL
(C) SECAM
(D) NTCS
Answer: B

Phase Alternating Line (PAL) is a colour encoding system for analogue television used in broadcast television systems in most countries broadcasting at 625-line / 50 field (25 frame) per second (576i). Other common colour encoding systems are NTSC and SECAM.

38. All India Radio before 1936 was known as:
(A) Indian Radio Broadcasting
(B) Broadcasting Service of India
(C) Indian Broadcasting Service
(D) All India Broadcasting Service
Answer: C

All India Radio had formally started functioning in 1936. Prior to this, the radio broadcasting had started in India under the banner of Indian Broadcasting Company. This company was taken over by the Government and in March 1935, the office of Controller of broadcasting was started in India. One year later, the name of Indian broadcasting was changed to All India Radio. The first AIR station was Delhi, which was followed by Calcutta, Bombay, Madras, Lucknow and Tiruchi. The term Akashavani was coined by Professor Dr. M.V. Gopalaswamy for his radio station in Mysore during 1936, however, AIR started using this name since 1957.

39. The biggest news agency of India is:
(A) PTI
(B) UNI
(C) NANAP
(D) Samachar Bharati
Answer: A

Press Trust of India (PTI) is the largest news agency in India. It is headquartered in New Delhi and is a nonprofit cooperative among more than 500 Indian newspapers and has more than 1,000 full-time employees, as on January 22, 2016.

40. Prasar Bharati was launched in the year:
(A) 1995
(B) 1997
(C) 1999
(D) 2001
Answer B

41. November 1997, New Delhi

Prasar Bharati is a statutory autonomous body established under the Prasar Bharati Act and came into existence on 23.11.1997. It is the Public Service Broadcaster of the country. The objectives of public service broadcasting are achieved in terms of Prasar Bharati Act through All India Radio and Doordarshan, which earlier were working as media units under the Ministry of I&B and since the above said date became constituents of Prasar Bharati.

42. Community Radio is a type of radio service that caters to the interest of:
(A) Local audience
(B) Education
(C) Entertainment
(D) News
Answer: A
43. Orcut is a part of:
(A) Intra personal Communication
(B) Mass Communication
(C) Group Communication
(D) Interpersonal Communication
Answer: D

44. Match List-I with List-II and select the correct answer using the codes given below:

List-I (Artists)	**List - II** (Art)
(a) Amrita Shergill	(i) Flute
(b) T. Swaminathan Pillai	(ii) Classical Song
(c) Bhimsenjoshi	(iii) Painting
(d) Padma Subramaniyam	(iv) Bharat Natyam

Codes:

	(a)	(b)	(c)	(d)
(A)	(iii)	(i)	(ii)	(iv)
(B)	(ii)	(iii)	(i)	(iv)
(C)	(iv)	(ii)	(iii)	(i)
(D)	(i)	(iv)	(ii)	(iii)

Answer: A

Amrita Sher-Gil was an eminent Hungarian-Indian painter. She has been called "one of the greatest avant-garde women artists of the early 20th century"

Thiruvalaputhur Swaminatha Pillai (died 13 March 1972) is an Indian dancer from Tamil Nadu.

Pandit Bhimsen Gururaj Joshi 4 February 1922 – 24 January 2011) was a legendary Indian vocalist from Karnataka in the Hindustani classical tradition. He is known for the khayal form of singing, as well as for his popular renditions of devotional music

Dr. Padma Subrahmanyam (born 4 February 1943, in Madras), is an Indian classical Bharata Natyam dancer. She is also a research scholar, choreographer, music composer, musician, school teacher and author. She is famous in India as well as abroad: several films and documentaries have been made in her honor by countries like Japan, Australia and Russia. She is well known as the developer and founder of the dance form Bharata Nrithyam. She is a devotee of the Paramacharya of Kanchi.

45. Which is not correct in latest communication award?
(A) Salman Rushdie - Booker's Prize - July 20, 2008
(B) Dilip Sanghavi - Business Standard CEO Award July 22, 2008
(C) Tapan Sinha - Dada Saheb Falke Award, July 21, 2008
(D) Gautam Ghosh - Osians Lifetime Achievement Award July 11, 2008
Answer: A and D

A Sir Ahmed Salman Rushdie, born 19 June 1947 is a British Indian novelist and essayist. His second novel, Midnight's Children (1981), won the Booker Prize in 1981 and was deemed to be "the best novel of all winners" on two separate occasions, marking the 25th and the 40th anniversary of the prize.

D Eminent filmmaker and pioneer of alternative cinema Mrinal Sen was on Friday felicitated with the Lifetime Achievement Award at the 10th edition of the Osian's Cinefest Film Festival 2008 in New Delhi. The award was given by filmmaker Mani Kaul.

46. Firewalls are used to protect a communication network system against:
(A) Unauthorized attacks
(B) Virus attacks
(C) Data-driven attacks
(D) Fire-attacks
Answer: A

The network firewall is the first line of defense for traffic that passes in and out of a network. The firewall examines traffic to ensure it meets the security requirements set by the organization, and unauthorized access attempts are blocked.

47. Which one of the following Telephonic Conferencing with a radio link is very popular throughout the world?
(A) TPS
(B) Telepresence
(C) Video conference
(D) Video teletext
Answer: C
48. Which is not 24 hours news channel?

(A) NDTV24x7
(B) ZEE News
(C) Aajtak
(D) Lok Sabha channel
Answer: D

49. The main objective of F.M. station in radio is:
(A) Information, Entertainment and Tourism
(B) Entertainment, Information and Interaction
(C) Tourism, Interaction and Entertainment
(D) Entertainment only
Answer: B

50. In communication chatting in internet is:
(A) Verbal communication
(B) Non verbal communication
(C) Parallel communication
(D) Grapevine communication
Answer: C

51. Match List-I with List-II and select List-I with the correct answer using the codes

(Artists)	**(Art)**
(a) Pandit Jasraj	(i) Hindustani vocalist
(b) Kishan Maharaj	(ii) Sitar
(c) Ravi Shankar	(iii) Tabla
(d) Udai Shankar	(iv) Dance

Codes:

	(a)	(b)	(c)	(d)
(A)	(i)	(ii)	(iii)	(iv)
(B)	(i)	(iii)	(iv)	(ii)
(C)	(i)	(iii)	(ii)	(iv)
(D)	(iii)	(ii)	(i)	(iv)

Answer: C

Pandit Jasraj (born 28 January 1930) is an Indian classical vocalist. He belongs to the Mewati gharana of Hindustani classical music. Pandit Kishan Maharaj was an Indian tabla player who belonged to the Benares gharana.

Ravi Shankar, 7 April 1920 – 11 December 2012), born Rabindra Shankar Chowdhury, his name often preceded by the title Pandit ('Master'), was a Bengali Indian musician and a composer of Hindustani classical music. He was one of the best-known exponents of the sitar in the second half of the 20th century and influenced many other musicians throughout the world. Uday Shankar, was an Indian dancer and choreographer, best known for creating a fusion style of dance, adapting European theatrical techniques to Indian classical dance

52. The country which has the distinction of having the two largest circulated newspapers in the world is
(A) Great Britain
(B) The United States
(C) Japan
(D) China
Answer: C

The Japanese Yomiuri Shimbun, Asahi Shimbun and Mainichi Shimbun are still the largest circulated newspapers in the world. The Times of India is the largest circulated English-language daily newspaper in the world, across all formats (Broadsheet, Compact, Berliner and Online)

53. The chronological order of non-verbal communication is
(A) Signs, symbols, codes, colours
(B) Symbols, codes, signs, colours
(C) Colours, signs, codes, symbols
(D) Codes, colours, symbols, signs
Answer: A

54. Which of the following statements is not connected with communication?
(A) Medium is the message.
(B) The world is an electronic cocoon.
(C) Information is power.
(D) Telepathy is technological.
Answer: D

Imagine if telepathy were real. If, for example, you could transmit your thoughts to a computer or to another person just by thinking them.

55. Communication becomes circular when
(A) The decoder becomes an encoder

(B) The feedback is absent
(C) The source is credible
(D) The channel is clear
Answer: A
56. The site that played a major role during the terrorist attack on Mumbai (26/11) in 2008 was:
(A) Orkut
(B) Facebook
(C) Amazon.com
(D) Twitter
Answer: D
57. Assertion (A): For an effective classroom communication at times it is desirable to use the projection technology**.**
Reason (R): Using the projection technology facilitates extensive coverage of course contents.
(A) Both (A) and (R) are true, and (R) is the correct explanation.
(B) Both (A) and (R) are true, but (R) is not the correct explanation.
(C) (A) is true, but (R) is false.
(D) (A) is false, but (R) is true.
Answer: A
58. In communication, a major barrier to reception of messages is
(a) Audience attitude
(B) Audience knowledge
(C) Audience education
(D) Audience income
Answer: A
59. Post-modernism is associated with
(A) Newspapers
(B) Magazines
(C) Radio
(D) Television
Answer: D
60. Didactic communication is
(A) Intra-personal
(B) Inter-personal
(C) Organisational
(D) Relational
Answer: B

Didactics is a theory of teaching, and in a wider sense, a theory and practical application of teaching and learning. In demarcation from "mathematics" (the science of learning), didactics refers only to the science of teaching. This teaching method that follows a consistent scientific approach or educational style to present information to students. The didactic method of instruction is often contrasted with dialectics and the Socratic Method; the term can also be used to refer to a specific didactic method, as for instance constructivist didactics

61. In communication, the language is
(A) The non-verbal code
(B) The verbal code
(C) The symbolic code
(D) The iconic code
Answer: B
62. Identify the correct sequence of the following:
(A) Source, channel, message, receiver
(B) Source, receiver, channel, message
(C) Source, message, receiver, channel
(D) Source, message, channel, receiver
Answer: D

This is the basic communications model, identified in 1949 by Shannon and Weaver, that distinguishes something of what happens between the person speaking (/writing, etc.) and the person listening (/watching, etc.).
Sequence: The basic sequence of the model is Source => Message => Channel => Receiver.
63. Assertion (A): Mass media promote a culture of violence in the society.
Reason (R): Because violence sells in the market as people themselves are violent in character.
(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(C) (A) is true, but (R) is false.
(D) Both (A) and (R) are false.
Answer: C

64. Media that exist in an interconnected series of communication – points are referred to as:
(A) Networked media
(B) Connective media
(C) Nodal media
(D) Multimedia
Answer: A
65. The information function of mass communication is described as
(A) diffusion
(B) publicity
(C) surveillance
(D) diversion
Answer: C
The major functions of mass communication are:
1. Surveillance
2. Interpretation
3. Transmission of values
4. Lineage
5. Entertainment.
The functions served by mass communication are very similar to those fulfilled by others types of communications.
66. An example of asynchronous medium is
(A) Radio
(B) Television
(C) Film
(D) Newspaper
Answer: D

Asynchronous Medium A communications medium that does not requires that both parties are present at the same time in the same space (for example: e-mail).

The word synchronous means working together at the same time, and in the online learning world, chat rooms and online conferences are good examples of synchronous communication. In a chat room, people's comments to each other are relayed immediately, enabling a real-time discourse. Similarly, online conferencing with the benefit of voice over Internet protocol (VOIP) tools enable real-time conversations to take place online. Learning from synchronous communication is enhanced because real-time conversations allow people to explore, through writing or talking, the class concepts. The act of verbalizing helps students build bridges between different ideas and concepts, thus helping them retain information more effectively.

Asynchronous communication is the relay of information with a time lag. Discussion forums and email are two examples of how asynchronous communication is employed in online learning. It is very helpful to communicate in this way, because students have plenty of time to formulate thoughts. By communicating via email, students are able to respond in detail to a question or topic that they might have answered incompletely in a real-time conversation. This time lag in communication helps students internalize information by giving them time to research certain ideas or merely extra time for contemplation. The main disadvantage to asynchronous communication is time lost waiting for a response..

67. In communication, connotative words are
(A) Explicit
(B) Abstract
(C) Simple
(D) Cultural
Answer: D

A connotation is a commonly understood cultural or emotional association that some word or phrase carries, in addition to its explicit or literal meaning, which is its denotation.

68. A message beneath a message is labelled as
(A) Embedded text
(B) Internal text
(C)Inter-text
(D) Sub-text
Answer: D
69. In analog mass communication, stories are
(A) Static
(B) Dynamic
(C) Interactive
(D) Exploratory
Answer: A

Analog mass communication is the one way process of transferring message to the receiver, or audience. Here the audience is large so they utilize analog media which was originally used in audio recording that was analogous to the count it was recreating. Here the contents can be only linear and static not dynamic

70. Public communication tends to occur within a more
(A) Complex structure
(B) Political structure
(C) Convenient structure
(D) Formal structure
Answer: C
71. Transforming thoughts, ideas and messages into verbal and non-verbal signs is referred to as
(A) Channelisation
(B) Mediation
(C) Encoding
(D) Decoding
Answer: C
72. Effective communication needs a supportive
(A) Economic environment
(B) Political environment
(C) Social environment
(D) Multi-cultural environment
Answer: C
73. A major barrier in the transmission of cognitive data in the process of communication is an individual's
(A) Personality
(B) Expectation
(C) Social status
(D) Coding ability
Answer: D
74. When communicated, institutionalized stereotypes become
(A) Myths
(B) Reasons
(C) Experiences
(D) Convictions (a firmly held belief or opinion)
Answer: D
75. In mass communication, selective perception is dependent on the receiver's
(A) Competence
(B) Pre-disposition
(C) Receptivity
(D) Ethnicity
Answer: C
76. Photo bleeding means
(A) Photo cropping
(B) Photo placement
(C) Photo cutting
(D) Photo colour adjustment
Answer: D

In printing, bleed is printing that goes beyond the edge of where the sheet will be trimmed. In other words, the bleed is the area to be trimmed off. The bleed is the part on the side of a document that gives the printer a small amount of space to account for movement of the paper, and design inconsistencies. Artwork and background colors often extend into the bleed area. After trimming, the bleed ensures that no unprinted edges occur in the final trimmed document.

77. While designing communication strategy feed-forward studies are conducted by
(A) Audience
(B) Communicator
(C) Satellite
(D) Media
Answer: B
Communication Strategies:
i. Feedforward
Literary and rhetorical critic, I. A. Richards, once remarked that there was nothing he learned that was more important than the concept of feedforward. It's an essential part of any communication act and yet is regularly ignored in many, if not most, of our textbooks. This is especially strange since we all give much attention to feedback; the other half needs to be given its due.
ii. Feedforward
It is information you provide before sending your primary message. Feedforward reveals something about the message to come. Feedforward exists in all forms of communication. Examples of feedforward include the preface or table of contents of a book, the opening paragraph of a chapter, movie previews, magazine covers, and introductions in public speeches. Feedforward may serve a variety of functions. Here are some of the **major functions:**

To Open the Channels of Communication. Feedforward helps you open the channels of communication and tells you another person is willing to communicate. It tells you that the normal, expected, and accepted rules of interaction will be in effect. It's the "How are you" and "Nice weather" greetings that are designed to maintain rapport and friendly relationships.

To Preview the Message. Feedforward messages may, for example, preview the content ("I'm afraid I have bad news for you"), the importance ("Listen to this before you make a move"), the form or style ("I'll tell you all the gory details"), and the positive or negative quality of subsequent messages ("You're not going to like this, but here's what I heard"). The subject heading on your e-mail illustrates this function of feedforward, as do the phone numbers and names that come up on your caller ID.

To Disclaim. The disclaimer is a statement that aims to ensure that your message will be understood as you want it to be and that it will not reflect negatively on you. For example, you might use a disclaimer when you think that what you're going to say may be met with opposition. Thus, you say "I'm not against immigration, but . . ." or "Don't think I'm homophobic, but . . ."

To Altercast. Feedforward is often used to place the receiver in a specific role and to request responses in terms of this assumed role, a process called altercasting. For example, you might altercast by asking a friend, "As a future advertising executive, what would you think of corrective advertising?" This question casts your friend in the role of advertising executive (rather than parent, Democrat, or Baptist, for example) and asks that she or he answer from a particular perspective.

Here are a few **suggestions** for giving effective feedforward.

- Use feedforward to estimate the receptivity of the person to what you're going to say. For example, before asking for a date, you'd probably use feedforward to test the waters and to see if you're likely to get a "yes" response. You might ask if the other person enjoys going out to dinner or if he or she is dating anyone seriously. Before asking a friend for a loan, you'd probably feedforward your needy condition and say something like "I'm really strapped for cash and need to get my hands on $200 to pay my car loan" and wait for the other person to say (you hope), "Can I help?"
- Use feedforward that's consistent with your subsequent message. If your main message is one of bad news, then your feedforward needs to be serious and help to prepare the other person for this bad news. You might, for example, say something like "I need to tell you something you're not going to want to hear. Let's sit down."
- The more important or complex the message, the more important and more extensive your feedforward needs to be. For example, in public speaking, in which the message is relatively long, you'd probably want to give fairly extensive feedforward or what is called an orientation or preview. At the start of a business meeting, the leader may give feedforward in the form of an agenda or meeting schedule.
- Avoid using overly long feedforwards that make your listener wonder whether you'll ever get to the business at hand. These will make you seem disorganized and lacking in focus.

78. In which language the newspapers have highest circulation?

(A) English
(B) Hindi
(C) Bengali
(D) Tamil

Answer: B

Average Qualifying Sales

Rank	Newspaper	Headquarters	Language	Jul-Dec 2015
1	Dainik Bhaskar	Bhopal	Hindi	3,818,477
2	Dainik Jagran	Kanpur	Hindi	3,307,517
3	The Times of India	Mumbai	English	3,057,678
4	Amar Ujala	Noida	Hindi	2,935,111
5	Hindustan	New Delhi	Hindi	2,409,604
6	Malayala Manorama	Kottayam	Malayalam	2,342,747
7	Rajasthan Patrika	Jaipur	Hindi	1,811,758
8	Eenadu	Hyderabad	Telugu	1,807,581
9	Daily Thanthi	Chennai	Tamil	1,667,442
10	The Hindu	Chennai	English	1,518,082
11	Parichay Times	Delhi	Hindi	43,000

79. The term 'SITE' stands for

(A) Satellite Indian Television Experiment
(B) Satellite International Television Experiment
(C) Satellite Instructional Television Experiment
(D) Satellite Instructional Teachers Education

Answer: C

80. Video-Conferencing can be classified as one of the following types of communication:

(A) Visual one way
(B) Audio-Visual one way
(C) Audio-Visual two way
(D) Visual two way

Answer: C

81. MC National University of Journalism and Communication is located at

(A) Lucknow
(B) Bhopal
(C) Chennai
(D) Mumbai
Answer: B
82. All India Radio (A.I.R.) for broadcasting was named in the year
(A) 1926
(B) 1936
(C) 1946
(D) 1956
Answer: B
83. In India for broadcasting TV programmes which system is followed?
(A) NTCS
(B) PAL
(C) NTSE
(D) SECAM
Answer B
84. The term 'DAVP' stands for
(A) Directorate of Advertising & Vocal Publicity
(B) Division of Audio-Visual Publicity
(C) Department of Audio-Visual Publicity
(D) Directorate of Advertising & Visual Publicity
Answer: D
The Directorate of Advertising and Visual Publicity is the nodal agency of the Government of India for advertising by various Ministries and organisations of Government of India, including public sector undertakings and autonomous bodies.
85. The term "TRP" is associated with TV shows stands for
(A) Total Rating Points
(B) Time Rating Points
(C) Thematic Rating Points
(D) Television Rating Points
Answer: D
Television Rating Point (TRP) is a tool provided to judge which programmes are viewed the most.
86. The English word 'Communication' is derived from the words
(A) Communis and Communicare
(B) Communist and Commune
(C) Communism and Communalism
(D) Communion and Common sense
Answer: A
87. Chinese Cultural Revolution leader Mao Zedong used a type of communication to talk to the masses is known as
(A) Mass line communication
(B) Group communication
(C) Participatory communication
(D) Dialogue communication
Answer: A
88. Conversing with the spirits and ancestors is termed as
(A) Transpersonal communication
(B) Intrapersonal communication
(C) Interpersonal communication
(D) Face-to-face communication
Answer: A
Transpersonal communication is interaction that occurs within a person's spiritual domain.
89. The largest circulated daily newspaper among the following is
(A) The Times of India
(B) The Indian Express
(C) The Hindu
(D) The Deccan Herald
Answer: A
90. The pioneer of the silent feature film in India was
(A) K.A. Abbas
(B) Satyajit Ray
(C) B.R. Chopra
(D) Dada Sahib Phalke

Answer: D

Dada sahib phalke was the pioneer of the silent feature film in India because he was released first silent in 18th May 1912. It was in marathi.

91. Classroom communication of a teacher rests on the principle of

(A) Infotainment
(B) Edutainment
(C) Entertainment
(D) Power equation

Answer: B

92. In the process of communication, which one of the following is in the chronological order?

(A) Communicator, Medium, Receiver, Effect, Message
(B) Medium, Communicator, Message, Receiver, Effect
(C) Communicator, Message, Medium, Receiver, Effect.
(D) Message, Communicator, Medium, Receiver, Effect.

Answer: C

93. Bengal Gazette, the first Newspaper in India was started in 1780 by

(A) Dr. Annie Besant
(B) James Augustus Hicky
(C) Lord Cripson
(D) A.O. Hume

Answer: B

Founded by James Augustus Hicky, a highly eccentric Irishman who had previously spent two years in jail for debt, the newspaper was a strong critic of the administration of the Governor General Warren Hastings.

94. Press censorship in India was imposed during the tenure of the Prime Minister

(A) Rajeev Gandhi
(B) Narasimha Rao
(C) Indira Gandhi
(D) Deve Gowda

Answer C

In 1975, the Indira Gandhi government imposed censorship of press during The Emergency. It was removed at the end of emergency rule in March 1977.

According to the Information Technology Rules 2011, objectionable content includes anything that "threatens the unity, integrity, defence, security or sovereignty of India, friendly relations with foreign states or public order".

95. Communication via New media such as computers, teleshopping, internet and mobile telephony is termed as

(A) Entertainment
(B) Interactive communication
(C) Developmental communication
(D) Communication

Answer: B

96. Classroom communication of a teacher rests on the principle of

(A) Infotainment
(B) Edutainment
(C) Entertainment
(D) Enlightenment

Answer: B

97. _____ is important when a teacher communicates with his/her student.

(A) Sympathy
(B) Empathy
(C) Apathy
(D) Antipathy

Answer: B - The ability to understand and share the feelings of another.

98. Classroom communication is normally considered as

(A) effective
(B) affective
(C) cognitive
(D) non-selective

Answer: C

Cognition is "the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses

99. Telephone is an example of

(A) linear communication
(B) non-linear communication
(C) circular

(D) mechanised
Answer: A
100. Means of grapevine communication are
(A) formal
(B) informal
(C) critical
(D) corporate
Answer: B
101. Communication issues at the international level are addressed by
(A) ILO
(B) ITU
(C) UNDP
(D) UNESCO
Answer: D

In response to calls for a "New World Information and Communication Order" in the late 1970s, UNESCO established the International Commission for the Study of Communication Problems, which produced the 1980 MacBride report (named after the Chair of the Commission, the Nobel Peace Prize laureate Seán MacBride). The same year, UNESCO created the International Programme for the Development of Communication (IPDC), a multilateral forum designed to promote media development in developing countries. In 1991, UNESCO's General Conference endorsed the Windhoek Declaration on media independence and pluralism, which led the UN General Assembly to declare the date of its adoption, 3 May, as World Press Freedom Day. Since 1997, UNESCO has awarded the UNESCO / Guillermo Cano World Press Freedom Prize every 3 May. In the lead up to the World Summit on the Information Society in 2003 (Geneva) and 2005 (Tunis), UNESCO introduced the Information for All Programme.

5. Referential framing used by TV audience connects media with
(A) reality
(B) falsity
(C) negativity
(D) passivity
Answer: A

Framing is visible in many media applications. Framing is referential only when it has reality such as in mass-media communication, a frame defines the packaging of an element of rhetoric in such a way as to encourage certain interpretations and to discourage others.

102. The communicated knowledge in a classroom is considered as
(A) non-pervasive treasure
(B) limited judgement
(C) autonomous virtue
(D) cultural capital
Answer: D
103. Users who use media for their own ends are identified as
(A) Passive audience
(B) Active audience
(C) Positive audience
(D) Negative audience
Answer: B
104. Classroom communication can be described as
(A) Exploration
(B) Institutionalisation
(C) Unsignified narration
(D) Discourse
Answer: D

Discourse denotes written and spoken communications: In semantics and discourse analysis: Discourse is a conceptual generalization of conversation within each modality and context of communication.

105. Ideological codes shape our collective
(A) Productions
(B) Perceptions
(C) Consumptions
(D) Creations
Answer: B
106. In communication myths have power but are
(A) uncultural
(B) insignificant
(C) imprecise
(D) unprefered

Answer: C

107. The first multi-lingual news agency of India was

(A) Samachar
(B) API
(C) Hindustan Samachar
(D) Samachar Bharati

Answer: C

Hindusthan Samachar was a multilingual news agency in India. It was set up in 1948 by S. S. Apte, offering its services in 10 languages

108. Organisational communication can be equated with

(A) intra-personal communication
(B) inter personal communication
(C) group communication
(D) mass communication

Answer: C

109. Break-down in verbal communication is described as

(A) Short Circuit
(B) Contradiction
(C) Unevenness
(D) Entropy

Answer: D

Entropy implies tendency towards degeneration of order existing within systems (e.g., when the perspective of a communicative goal is lost, verbal communication may easily lead to a breakdown entropy refers to disorder or uncertainty, and the definition of entropy used in information theory is directly analogous to the definition used in statistical thermodynamics. The concept of information entropy was introduced by Claude Shannon in his 1948 paper "A Mathematical Theory of Communication"

110. The Telephone Model of Communication was first developed in the area of

(A) Technological theory
(B) Dispersion theory
(C) Minimal effects theory
(D) Information theory

Answer: D

Models of communication are conceptual models used to explain the human communication process. The first major model for communication was developed in 1948 by Claude Elwood Shannon and published with an introduction by Warren Weaver for Bell Laboratories.

Following the basic concept, communication is the process of sending and receiving messages or transferring information from one part (sender) to another (receiver)

The Shannon–Weaver model was designed to mirror the functioning of radio and telephone technology. Their initial model consisted of four primary parts: sender, message, channel, and receiver.

111. The Dada Saheb Phalke Award for 2013 has been conferred on

(A) Karan Johar
(B) Amir Khan
(C) Asha Bhonsle
(D) Gulzar

Answer: D

112. Photographs are not easy to

(A) Publish
(B) Secure
(C) Decode
(D) Change

Answer: C

113. The grains that appear on a television set when operated are also referred to as

(A) Sparks
(B) Green Dots
(C) Snow
(D) Rain Drops

Answer: C

Grains appearing on TV sets are known as dots or snow and are random pattern superimposed on the picture which are result of electronic noise and radiated electromagnetic noise accidentally picked up by the antenna.

114. In circular communication, the encoder becomes a decoder when there is

(A) Noise
(B) Audience
(C) Criticality

(D) Feedback
Answer: D
115. the mode of communication that involves a single source transmitting information to a large number of receivers simultaneously, is called
(A) Group Communication
(B) Mass Communication
(C) Intrapersonal Communication
(D) Interpersonal Communication
Answer: B
116. A smart classroom is a teaching space which has
(i) Smart portion with a touch panel control system.
(ii) PC/Laptop connection and DVD/VCR player.
(iii) Document camera and specialized software
(iv) Projector and screen
Select the correct answer from the codes given below:
(A) (i) and (ii) only
(B) (ii) and (iv) only
(C) (i), (ii) and (iii) only
(D) (i), (ii), (iii) and (iv)
Answer: D
117. The term "Yellow Journalism" refers to
(A) Sensational news about terrorism and violence
(B) Sensationalism and exaggeration to attract readers / viewers.
(C) Sensational news about arts and culture.
(D) Sensational news prints in yellow paper.
Answer: B
Yellow Journalism Sensationalism and exaggeration to attract readers / viewers, provides little or no legitimate news eye catching headlines to sell more newspapers
118. In the classroom, the teacher sends the message either as words or images. The students are really
(A) Encoders
(B) Decoders
(C) Agitators
(D) Propagators
Answer: B
119. Effectiveness of communication can be traced from which of the following
(a) Attitude surveys
(b) Performance records
(c) Students attendance
(d) Selection of communication channel
(A) (a), (b), (c) and (d)
(B) (a), (b) and (c)
(C) (b), (c) and (d)
(D) (a), (b) and (d)
Answer: D
120. ASSERTION : Formal communication tends to be fast and flexible
REASON: Formal communication is a systematic and orderly flow of information
(A) Both (A) and (R) are correct and (R) is correct explanation of (A)
(B) Both (A) and (R) are correct, but (R) is not correct explanation of (A)
(C) (A) is correct but, (R) is false
(D) (A) is false but, (R) is correct
Answer: D
121. Which of the following are the characteristic features of communication?
1) Communication involves exchange of ideas, facts and opinions
2) Communication involves both information and understanding
3) Communication is a continuous process
4) Communication is a circular process
(A) (a), (b) and (c)
(B) (a), (b) and (d)
(C) (b), (c) and (d)
(D) (a), (b), (c) and (d)
Answer: D
122. The term 'grapevine' is also known as

(A) Downward communication
(B) Informal communication
(C) Upward communication
(D) Horizontal communication
Answer: B
123. Which of the following is not a principle of effective communication?
(A) Persuasive and convincing dialogue
(B) Participation of the audience
(C) One-way transfer of information
(D) Strategic use of grapevine
Answer: C
124. In communication, the language is
(A) The verbal code
(B) Intrapersonal
(C) The symbolic code
(D) The non-verbal code
Answer: A
125. Using the central point of the classroom communication as the beginning of a dynamic pattern of ideas is referred to as:
(A) Systemization
(B) Problem – orientation
(C) Idea protocol
(D) Mind mapping
Answer: D

Mind mapping is one of the best ways to capture your thoughts and bring them to life in visual form. A mind map is a diagram used to visually organize information. A mind map is hierarchical and shows relationships among pieces of the whole. It is often created around a single concept, drawn as an image in the center of a blank page, to which associated representations of ideas such as images, words and parts of words are added. Major ideas are connected directly to the central concept, and other ideas branch out from those.

Mind maps can be drawn by hand, either as "rough notes" during a lecture, meeting or planning session, for example, or as higher quality pictures when more time is available. Mind maps are considered to be a type of spider diagram. A similar concept in the 1970s was "idea sun bursting

126. Aspects of the voice, other than the speech are known as:
(A) Physical language
(B) Personal language
(C) Para language
(D) Delivery language
Answer: C
127. Every type of communication is affected by its:
(A) Reception
(B) Transmission
(C) Non-regulation
(D) Context
Answer: D
128. Attitudes, actions and appearances in the context of classroom communication are considered as:
(A) Verbal
(B) Non-verbal
(C) Impersonal
(D) Irrational
Answer: B
129. Most often, the teacher - student communication is:
(A) Spurious
(B) Critical
(C) Utilitarian
(D) Confrontational
Answer: C
130. In a classroom, a communicator's trust level is determined by:
(A) The use of hyperbole
(B) The change of voice level
(C) The use of abstract concepts
(D) Eye contact
Answer: D
131. The choice of communication partners is influenced by factors of

(A) Proximity, utility, loneliness
(B) Utility, secrecy, dissonance
(C) Secrecy, dissonance, deception
(D) Dissimilarity, dissonance, deviance
Answer: A
Proximity: nearness in space, time, or relationship.
Utility: the state of being useful, profitable, or beneficial.
Loneliness: the quality of being unfrequented
132. Every communicator has to experience
(A) Manipulated emotions
(B) Anticipatory excitement
(C) The issue of homophiles
(D) Status dislocation
Answer: B
133. As a teacher, select the best option to ensure your effective presence in the classroom.
(A) Use of peer command
(B) Making aggressive statements
(C) Adoption of well-established posture
(D) Being authoritarian
Answer C
134. Imagine you are working in an educational institution where people are of equal status. Which method of communication is best suited and normally employed in such a context?
(A) Horizontal communication
(B) Vertical communication
(C) Corporate communication
(D) Cross communication
Answer: A
135. Identify the important element a teacher has to take cognizance of while addressing students in a classroom.
(A) Avoidance of proximity
(B) Voice modulation
(C) Repetitive pause
(D) Fixed posture
Answer: B cognizance: knowledge or awareness
136. What are the barriers to effective communication?
(A) Moralizing, being judge mental and comments of consolation.
(B) Dialogue, summary and self-review.
(C) Use of simple words, cool reaction and defensive attitude.
(D) Personal statements, eye contact and simple narration.
Answer: A
137. Internal and external factors that affect message reception by the students in the classroom are referred to as
(A) Feedback
(B) Fragmentation
(C) Channelization
(D) Noise
Answer D
138. A teacher in a classroom has immediate control over
(A) The self, selected methods of communication and the message.
(B) The audience, the noise and the reception.
(C) The feedback, the technology and the audience experience.
(D) The communication channel, other communicators, and external factors.
Answer: A
139. What do communicated words carry in a classroom situation?
(A) Inspiration, controversy and introspection
(B) Diversion, criticism and irrationality
(C) Insipidity, irrationality, and non-acceptance
(D) Power, structure and tradition
Answer: D
140. As a good classroom communicator, you are supposed to know your
(A) Audience emotions
(B) Silent cues
(C) Artful pauses
(D) Counter arguments

Answer: C

141. Figure out the components of non-verbal communication in a classroom from the following:

(A) Facial expression, cultural space and seating arrangement

(B) Speed of utterance, feel good factor and acoustics

(C) High sound, physical ambience and teacher-learner distance

(D) Facial expression, kinesics and personal space

Answer: D

142. Which of the following are the basic factors of effective listening?

(A) Opinionating, stare and glare and interruptions

(B) Aggressive questioning, continuous cues and frequent movement

(C) Me-too-ism, glancing sideways, and offering advice

(D) Acknowledgement of thoughts, reflection, and asking open-ended questions

Answer: D

143. The typical feature of an information- rich class room lecture is in the nature of being

A. Sedentary

B. Staggered

C. Factual

D. Sectoral

Answer: C

144. Expressive communication is driven by

A. Passive aggressions

B. Encoder's personality characteristics

C. Encoder-Decoder contract

D. External clues

Answer: C

145. Positive classroom communication leads to

A. Coercion

B. Submission

C. Confrontation

D. Persuasion

Answer: D

146. Classroom communication is the basis of

A. Social identity

B. External inanities

C. Biased passivity

D. Group aggression

Answer: A

147. Effective communication pre-supposes

A. Non alignment

B. Domination

C. Passivity

D. Understanding

Answer: D

148 The interaction between a teacher and students creates a zone of proximal:

(1) Difference

(2) Confusion

(3) Development

(4) Distortion

Answer: 3

149. The spatial audio reproduction in a classroom can reduce the students':

(1) Cognitive load in understanding

(2) Respect for the teacher

(3) Motivation for excellence

(4) Interest in technology - orientation

Answer: 1

150. The classroom communication should essentially be:

(1) Contrived

(2) Empathetic

(3) Abstract

(4) Non-descriptive

Answer: 2

151. A good communicator begins his/her presentation with a:

(1) Complex question
(2) Non-sequitur
(3) Repetitive phrase
(4) Ice-breaker
Answer: 4
152. In a classroom, the probability of message reception can be enhanced by:
(1) Establishing a viewpoint
(2) Exposing the ignorance of students
(3) Increasing the information load
(4) Using high decibel audio tools
Answer: 1

UNIT – 5 & 6

LOGICAL & MATHEMATICAL REASONING

UNIT 5 & 6: LOGICAL AND MATHEMATICAL REASONING

LOGICAL REASONING

In Logic, any categorical statement is termed as the Proposition.

A **Proposition** (or a categorical statement) is a statement that asserts that either a part of, or the whole of, one set of objects - the set identified by the subject term in the sentence expressing that statement - either is included in, or is excluded from, another set - the set identified by the predicate term in that sentence.

The standard form of a proposition is :

Quantifier + Subject + Copula + Predicate

Thus, the proposition consists of four parts :

1. **Quantifier**: The words 'all', 'no' and 'some' are called quantifiers because they specify a quantity 'All' and 'no' are universal quantifiers because they refer to every object in a certain set, while the quantifier 'some' is a particular quantifier because it refers to at least one existing object in a certain set.

2. **Subject (denoted by 'S')**: The subject is that about which something is said.

3. **Predicate (denoted by 'P')**: The predicate is the part of the proposition denoting that which is affirmed or denied about the subject.

4. **Copula** : The copula is that part of the proposition which denotes the relation between the subject and the predicate.

Examples:

Four-Fold Classification of Propositions :

A proposition is said to have a universal quantity if it begins with a universal quantifier, and a particular quantity if it begins with a particular quantifier. Besides, propositions which assert

something about the inclusion of the whole or a part of one set in the other are said to have affirmative quality, while those which deny the inclusion of the whole or a part of one set in the other are said to have a negative quality. Also, a term is distributed in a proposition if it refers to all members of the set of objects denoted by that term. Otherwise, it is said to be undistributed. Based on the above facts, propositions can be classified into four types :

1. Universal Affirmative Proposition (denoted by A): It distributes only the subject i.e. the predicate is not interchangeable with the subject while maintaining the validity of the proposition.

e.g., All snakes are reptiles. This is proposition A since we cannot say 'All reptiles are snakes'.

2. Universal Negative Proposition (denoted by E): It distributes both the subject and the predicate i.e. an entire class of predicate term is denied to the entire class of the subject term, as in the proposition.

e.g., No boy is intelligent.

3.Particular Affirmative Proposition (denoted by I): It distributes neither the subject nor the predicate.

e.g.,Some men are foolish. Here, the subject term 'men' is used not for all but only for some men and similarly the predicate term 'foolish' is affirmed for a part of subject class. So, both are undistributed.

4. Particular Negative Proposition (denoted by O): It distributes only the predicate. e.g., Some animals are not wild. Here, the subject term 'animals' is used only for a part of its class and hence is undistributed while the predicate term 'wild' is denied in entirety to the subject term and hence is distributed. These facts can be summarized as follows :

Statement Form	Quantity	Quality	Distributed
(A): All S is P.	Universal	Affirmative	S only
(E): No S is P.	Universal	Negative	Both S and P
(I): Some S is P.	Particular	Affirmative	Neither S nor P
(O): Some S is not P	Particular	Negative	P only

LOGICAL DEDUCTION:

The phenomenon of deriving a conclusion from a single proposition or a set of given propositions, is known as **logical deduction**. The given propositions are also referred to as the **premises**.

Two Inferential Processes of Deduction :

I. Immediate Deductive Inference :

Here, conclusion is deduced from one of the given propositions, by any of the three ways - conversion, obversion and contraposition.

1. Conversion: The Conversion proceeds with interchanging the subject term and the predicate term i.e. the subject term of the premise becomes the predicate term of the conclusion and the predicate term of the premise becomes the subject of the conclusion. The given proposition is called convertend, whereas the conclusion drawn from it is called its converse.

Table of Valid Conversions

Convertend	Converse
A: All S is P Ex. All pins are tops.	I: Some P is S Some tops are pins.
E: No S is P. Ex. No fish is whale.	E: No P is S. No whale is fish.
I: Some S is P. Ex. Some boys are poets.	I: Some P is S. Some poets are boys.
O: Some S is not P.	No valid conversion

Note that in a conversion, the quality remains the same and the quantity may change.

2. Obversion: In obversion, we change the quality of the proposition and replace the predicate term by its complement.

Table of Valid Obversions

Obvertend	Obverse
A: All birds are mammals.	E: No birds are non-mammals.
E: No poets are singers.	A: All poets are non-singers.
I: Some nurses are doctors.	O: Some nurses are not non-doctors.
O: some politicians are not statesmen.	I: Some politicians are non-statesmen.

3. Contraposition: To obtain the contrapositive of a statement, we first replace the subject and predicate terms in the proposition and then exchange both these terms with their complements.

Table of Valid Contrapositions

Proposition	Contrapositive
A: All birds are mammals.	A: All non-mammals are non-birds.
I: Some birds are mammals.	I: Some non-mammals are non-birds.

Note: The valid converse, obverse or contrapositive of a given proposition always logically follows from the proposition.

II. Mediate Deductive Inference (SYLLOGISM): First introduced by Aristotle, a Syllogism is a deductive argument in which conclusion has to be drawn from two propositions referred to as the premises.

Example:

1. All lotus are flowers.
2. All flowers are beautiful.
3. All lotus are beautiful.

Clearly, the propositions 1 and 2 are the premises and the proposition 3, which follows from the first two propositions, is called the conclusion.

Term : In Logic, a **term** is a word or a combination of words, which by itself can be used as a subject or predicate of a proposition.

Syllogism is concerned with three terms :

1. Major Term : It is the predicate of the conclusion and is denoted by P (first letter of 'Predicate').

2. Minor Term: It is the subject of the conclusion and is denoted by S (first letter of 'Subject').

3. Middle Term: It is the term common to both the premises and is denoted by M (first letter of 'Middle').

Example:

Premises:

1. All dogs are animals.
2. All tigers are dogs.

Conclusion :

All tigers are animals.

Here 'animals' is the predicate of the conclusion and so,.it is the major term. P.

'Tigers' is the subject of the conclusion and so, it is the minor term, S.

'Dogs' is the term common to both the premises and so, it is the middle term, M.

Major And Minor Premises : Of the two premises, the major premise is that in which the middle term is the subject and the minor premise is that in which the middle term is the predicate.

RULES FOR DERIVING CONCLUSION FROM TWO GIVEN PREMISES:

1. The conclusion does not contain the middle term.

Example.

Statements :

1. All men are girls.

2. Some girls are students.

Conclusions :

1. All girls are men.

2. Some girls are not students.

Since both the conclusions 1 and 2 contain the middle term 'girls', so neither of them can follow.

2. No term can be distributed in the conclusion unless it is distributed in the premises.

Example.

Statements :

1. Some dogs are goats.

2. All goats are cows.

Conclusions :

1. All cows are goats.

2. Some dogs are cows.

Statement 1 is an I-type proposition which distributes neither the subject nor the predicate.

Statement 2 is an A type proposition which distributes the subject i.e. 'goats' only.

Conclusion 1 is an A-type proposition which distributes the subject 'cow' only Since the term 'cows' is distributed in conclusion 1 without being distributed in the premises, so conclusion 1 cannot follow.

3. The middle term (M) should he distributed at least once in the premises. Otherwise, the conclusion cannot follow.

For the middle term to be distributed in a premise.

(i) M must be the subject if premise is an A proposition.

(ii) M must be subject or predicate if premise is an E proposition.

(iii) M must be predicate if premise is an O proposition.

Note that in an I proposition, which distributes neither the subject nor the predicate, the middle term cannot be distributed.

Example.

Statements :

1. All fans are watches.

2. Some watches are black.

Conclusions :

1. All watches are fans.

2. Some fans are black.

In the premises, the middle term is 'watches'. Clearly, it is not distributed in the first premise which is an A proposition as it does not form its subject. Also, it is not distributed in the second premise which is an I proposition. Since the middle term is not distributed even once in the premises, so no conclusion follows.

4. No conclusion follows

(a) if both the premises are particular

Example.

Statements :

1. Some books are pens.

2. Some pens are erasers.

Conclusions:

1. All books are erasers.

2. Some erasers are books.

Since both the premises are particular, so no definite conclusion follows.

(b) if both the premises are negative.

Example.

Statements :

1. No flower is mango.

2. No mango is cherry.

Conclusions :

1. No flower is cherry.

2. Some cherries are mangoes. Since both the premises are negative, neither conclusion follows.

(c) if the major premise is particular and the minor premise is negative.

Example.

Statements:

1. Some dogs are bulls.

2. No tigers are dogs.

Conclusions:

1. No dogs are tigers.

2. Some bulls are tigers.

Here, the first premise containing the middle term 'dogs' as the subject is the major premise and the second premise containing the middle term 'dogs' as the predicate is the minor premise. Since the major premise is particular and the minor premise is negative, so no conclusion follows.

5. If the middle term is distributed twice, the conclusion cannot be universal.

Example.

Statements :

1. All fans are chairs.

2. No tables are fans.

Conclusions:

1. No tables are chairs.

2. Some tables are chairs.

Here, the first premise is an A proposition and so, the middle term 'fans' forming the subject is distributed. The second premise is an E proposition and so, the middle term 'fans' forming the predicate is distributed. Since the middle term is distributed twice, so the conclusion cannot be universal.

6. If one premise is negative, the conclusion must be negative.

Example.

Statements:

1. All grasses are trees.

2. No tree is shrub.

Conclusions:

1. No grasses are shrubs.

2. Some shrubs are grasses.

Since one premise is negative, the conclusion must be negative. So, conclusion 2 cannot follow.

7. If one premise is particular, the conclusion must be particular.

Example.

Statements:

1. Some boys are thieves.

2. All thieves are dacoits.

Conclusions :

1. Some boys are dacoits.

2. All dacoits are boys.

Since one premise is particular, the conclusion must be particular. So, conclusion 2 cannot follow.

8. If both the premises are affirmative, the conclusion must be affirmative.

Example.

Statements :

1. All women are mothers.

2. All mothers are sisters.

Conclusions :

1. All women are sisters.

2. Some women are not sisters.

Since both the premises are affirmative, the conclusion must be affirmative. So, conclusion 2 cannot follow.

9. If both the premises are universal, the conclusion must be universal.

Complementary pair:

A pair of contradictory statements i.e. a pair of statements such that if one is true, the other is false and when no definite conclusion can be drawn, either of them is bound to follow, is called a

complementary pair. E and I-type propositions together form a complementary pair and usually either of them follows, in a case where we cannot arrive at a definite conclusion, using the rules of syllogism.

Let us study the various possible cases and draw all possible inferences in each case, along with verification through Venn diagrams.

Case 1: All men are boys. All boys are students.

Immediate Deductive Inferences:

The converse of first premise i.e. 'Some boys are men' and the converse of second premise i.e. 'Some students are boys' both hold.

Mediate Deductive Inferences:

Since both the premises are universal and affirmative, the conclusion must be universal affirmative. Also, the conclusion should not contain the middle term. So, it follows that 'All men are students'. The converse of this conclusion i.e. 'Some students are men' also holds.

Case 2: All birds are animals. All fishes are animals.

Immediate Deductive Inferences:

The converse of first premise i.e. 'Some animals are birds' and the converse of second premise i.e. 'Some animals are fishes' both hold.

Mediate Deductive Inferences:

Both, being A-type propositions, distribute subject only. Thus, the middle term 'animals' is not distributed even once in the premises. So, no definite conclusion follows.

Case 3: All puppets are dolls. Some dolls are rattles.

Immediate Deductive Inferences:

The converse of the first premise i.e. 'Some dolls are puppets' and the converse of the second premise i.e. 'Some rattles are dolls', both hold.

Mediate Deductive Inferences:

First premise, being an A-type proposition, distributes the subject only while the second premise, being an I-type proposition, distributes neither subject nor predicate. Since the middle term 'dolls' is not distributed even once in the premises, so no definite conclusion can be drawn.

Case 4: Some writers are players. All players are musicians.

Immediate Deductive Inferences :

The converse of the first premise i.e. 'Some players are writers' and the converse of the second premise i.e. 'Some musicians are players', both hold.

Mediate Deductive Inferences:

Since one premise is particular, the conclusion must be particular and should not contain the middle term. So, it follows that 'Some writers are musicians'. The converse of this conclusion i.e. 'Some musicians are writers' also holds.

Case 5: All boxes are toys. Some boxes are clips.

Immediate Deductive Inferences :

The converse of the first premise i.e. 'Some toys are boxes' and the converse of the second premise i.e. 'Some clips are boxes', both hold.

Mediate Deductive Inferences:

Since one premise is particular, the conclusion must be particular and should not contain the middle term. So, it follows that 'Some toys are clips'. The converse of this conclusion i.e. 'Some clips are toys' also holds.

Case 6: All buses are vans. Some cycles are vans.

Immediate Deductive Inferences:

The converse of the first premise i.e. 'Some vans are buses' and the converse of the second premise i.e. 'Some vans are cycles', both hold.

Mediate Deductive Inferences:

First premise, being an A-type proposition, distributes subject only and the second premise, being an I-type proposition, distributes neither subject nor predicate. So, the middle term 'vans' is not distributed even once in the premises. Hence, no definite conclusion can be drawn.

Case 7: Some radios are cameras. Some cameras are statues.

Immediate Deductive Inferences:

The converse of the first premise i.e. 'Some cameras are radios' and the converse of the second premise i.e. 'Some statues are cameras', both hold.

Mediate Deductive Inferences :

Since both premises are particular, no definite conclusion follows.

Case 8: All cakes are candies. No candy is pastry.

Immediate Deductive Inferences:

The converse of the first premise i.e. 'Some candies are cakes' and the converse of the second premise i.e. 'No pastry is candy', both hold.

Mediate Deductive Inferences:

Since both premises are universal, the conclusion must be universal. Since one premise is negative, the conclusion must be negative. So, it follows that 'No cake is pastry'. The converse of this conclusion i.e. 'No pastry is cake' also holds.

Case 9: No coin is ring. All rings are bangles.

Immediate Deductive Inferences :

The converse of the first premise i.e. 'No ring is coin' and the converse of the second premise i.e.'Some bangles are rings', both hold.

Mediate Deductive Inferences:

First premise, being an E-type proposition, distributes both the subject and the predicate. Second premise, being an A-type proposition, distributes the subject. Thus, the middle term 'ring' is distributed twice in the premises. So, the conclusion cannot be universal. Also, since one premise is negative, the conclusion must be negative. Thus, the conclusion must be particular negative i.e. O-type. So, it follows that 'some bangles are not coins'.

Case 10: Some lamps are candles. No candle is bulb.

Immediate Deductive Inferences :

The converse of the first premise i.e. 'Some candles are lamps' and the converse of the second premise i.e. 'No bulb is candle', both hold.

Mediate Deductive Inferences:

Since one premise is particular and the other negative, the conclusion must be particular negative i.e. O-type, So, it follows that 'Some lamps are not bulbs'.

Important Points To Remember:

While deriving logical conclusions, always remember that the following conclusions hold :

1. The converse of each of the given premises;

2. The conclusion that directly follows from the given premises in accordance with the rules of syllogism;

3. The converse of the derived conclusions.

MCQs

1. Statements: No women teacher can play. Some women teachers are athletes.

Conclusions:

I. Male athletes can play.

II. Some athletes can play.

A. Only conclusion I follows

B. Only conclusion II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer: **Option D**

Explanation:

Since one premise is negative, the conclusion must be negative. So, neither conclusion follows.

2. Statements: All bags are cakes. All lamps are cakes.

Conclusions:

I. Some lamps are bags.

II. No lamp is bag.

A.	Only conclusion I follows
B.	Only conclusion II follows
C.	Either I or II follows
D.	Neither I nor II follows
E.	Both I and II follow

Answer: Option **C**

Explanation:

Since the middle term 'cakes' is not distributed even once in the premises, no definite conclusion follows. However, I and II involve only the extreme terms and form a complementary pair. So,

either I or II follows.

3. Statements: All mangoes are golden in colour. No golden-coloured things are cheap.

Conclusions:

I. All mangoes are cheap.

II. Golden-coloured mangoes are not cheap.

A.	Only conclusion I follows
B.	Only conclusion II follows
C.	Either I or II follows
D.	Neither I nor II follows
E.	Both I and II follow

Answer: Option **B**

Explanation:

Clearly, the conclusion must be universal negative and should not contain the middle term. So, it follows that 'No mango is cheap'. Since all mangoes are golden in colour, we may substitute 'mangoes' with 'golden-coloured mangoes'. Thus, II follows.

4. Statements: Some kings are queens. All queens are beautiful.

Conclusions:

I. All kings are beautiful.

II. All queens are kings.

A.	Only conclusion I follows
B.	Only conclusion II follows
C.	Either I or II follows
D.	Neither I nor II follows
E.	Both I and II follow

Answer: Option **D**

5. Explanation:

Since one premise is particular, the conclusion must be particular. So, neither I nor II follows.

Statements: Some doctors are fools. Some fools are rich.

Conclusions:

I. Some doctors are rich

II. Some rich are doctors.

A.	Only conclusion I follows
B.	Only conclusion II follows
C.	Either I or II follows
D.	Neither I nor II follows
E.	Both I and II follow

Answer: Option **D**

Explanation:

Since both the premises are particular, no definite conclusion follows.

6. Statements: All roads are waters. Some waters are boats.

Conclusions:

I. Some boats are roads.

II. All waters are boats.

A.	Only conclusion I follows
B.	Only conclusion II follows
C.	Either I or II follows
D.	Neither I nor II follows
E.	Both I and II follow

Answer: Option **D**

Explanation:

The first premise is A type and distributes the subject. So, the middle term 'waters' which forms its predicate, is not distributed. The second premise is I type and does not distribute either subject or predicate. So, the middle term 'waters' forming its subject is not distributed. Since the middle term is not distributed even once in the premises, no definite conclusion follows.

7. Statements: No bat is ball. No ball is wicket.

Conclusions:

I. No bat is wicket.

II. All wickets are bats.

A.	Only conclusion I follows
B.	Only conclusion II follows
C.	Either I or II follows
D.	Neither I nor II follows
E.	Both I and II follow

Answer: Option **D**

Explanation:

Since both the premises are negative, no definite conclusion follows.

8. Statements: All flowers are trees. No fruit is tree.
Conclusions:
I. No fruit is flower.
II. Some trees are flowers.

A. Only conclusion I follows

B. Only conclusion II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer: Option **E**
Explanation:
As discussed above, the conclusion must be universal negative and should not contain the middle term. So, it follows that 'No flower is fruit'. I is the converse of this conclusion and thus it follows. II is the converse of the first premise and so it also holds.

9. Statements: Every minister is a student. Every student is inexperienced.
Conclusions:
I. Every minister is inexperienced.
II. Some inexperienced are students.

A. Only conclusion I follows

B. Only conclusion II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer: Option **E**
Explanation:
'Every' is equivalent to 'All'. Thus, since both the premises are universal and affirmative, the conclusion must be universal affirmative and should not contain the middle term. So, I follows. II is the converse of the second premise and thus it also holds.

10. Statements: All roads are poles. No pole is a house.
Conclusions:
I. Some roads are houses.
II. Some houses are poles.

A. Only conclusion I follows

B. Only conclusion II follows

C. Either I or II follows

D. Neither I nor II follows

E. Both I and II follow

Answer: Option **D**

Explanation:

Since both the premises are universal and one premise is negative, the conclusion must be universal negative. So, neither I nor II follows.

REASONING (INCLUDING MATHEMATICS)

Reasoning is of two types, namely, verbal and non-verbal. Verbal reasoning is basically about words rather than things. Verbal reasoning tests use words, letters, and numbers and require logical reasoning and a reasonable knowledge of English. It is also necessary to be familiar with simple, basic mathematical operations such as addition, subtraction, division, and multiplication. Non-verbal is basically about figures.

As far as UGC NET Exam pattern is concerned, mathematical reasoning is covering mainly verbal and basic mathematical skills such as series completion, coding and decoding, classification (odd man out, and so on), and analogical relationship. Questions on direction sense and seating arrangement also appear regularly in the exam.

Some topics such as Direction Sense and Venn Diagrams combine both verbal and non-verbal skills.

Series Completion

A series may be a number series or letter series. There are several kinds of series such as finding the missing numbers, replacing the wrong numbers, finding the missing letters, finding the wrong group of numbers or letters, etc.

NUMBER SERIES

Prime Number Series

Example-1
2, 3, 5, 7, 11, 13, …
a) 18 (b) 19 (c) 15 (d) 17
Solution: This series is a prime number series. So the next number in series is (d) 17.

Example-2
2, 5, 11, 17, 23, 31, 37, ….
a) 29 (b) 31 (c) 43 (d) 39
Solution: The prime numbers are written alternately. (c) 43

Difference Series

Example-3
2, 5, 8, 11, 14, 17, ….., 23, 26
a) 19 (b) 21 (c) 20 (d) 18
Solution: The difference between the numbers is (c) 2. (17+3=20)

Multiplication Series

Example-4
2, 6, 18, 54, ….., 486, 1458
a) 152 (b) 182 (c) 162 (d) 108
Solution: The numbers are multiplied by 3 to get the next number. (54 x 3 = 162) (c)

Example-5
3, 12, 48, ……, 768, 3072
a) 192 (b) 216 (c) 512 (d) 72
Solution: The numbers are multiplied by 4 to get the next number. (48 x 4 = 192) (a)

Division Series

Example-6
32, 48, 72, …., 162, 243
a) 84 (b) 96 (c) 108 (d) 132
Solution: Each number is being multiplied by 3/2 to get the next number. (c)

N^2 Series

Example-7
1, 4, 9, 16, 25, 36, …., 64
a) 42 (b) 44 (c) 45 (d) 49
Solution: The series is squares of 1, 2, 3, 4, and so on. (d)

Example-8
0, 4, 16, 36, 64, ….., 144
a) 100 (b) 84 (c) 96 (d) 120
Solution: The series is squares of even number such as 2, 4, 6, 8, 10 and 12. So, the answer is $10^2 = 100$. (a)

$N^2 – 1$ Series

Example-9
0, 3, 8, 15, 24, 35, 48, 63, ….
a) 80 (b) 82 (c) 83 (d) None of these
Solution: The series is $1^2 – 1$, $2^2 – 1$, $3^2 – 1$, and so on. The next number is $9^2 – 1 = 80$. (a)

Alternative Solution: The differences between the numbers across the series are 3, 5, 7, 9, 11, 13, 15, and 17. The next number is 63 + 17 = 80.

$N^2 + 1$ Series

Example-10
2, 5, 10, 17, 26, 37, ……, 65
a) 50 (b) 48 (c) 49 (d) 51
Solution: The series is $1^2 + 1$, $2^2 + 1$, $3^2 + 1$, and so on. The next number is $7^2 + 1 = 50$. (a)

$N^2 + N$ Series and $N^2 – N$ Series

Example-11
0, 2, 6, 12, 20, 30, …...., 56
a) 36 (b) 40 (c) 42 (d) None of these
Solution: The series is 0 (square) +0, 1 (square) + 1, 2 (square) + 2, 3 (square) + 3 and so on. The missing number is 6 (square) + = 42. The next number is $6^2 + 6 = 42$. (c)

First Alternative Solution: The series is 0 x 1, 1 x 2, ….. 1 x 2, 2 x 3, 3 x 4, 4 x 5 and 5 x 6 = 30. The next number is 6 x 7 = 42.

Second Alternative Solution: The series is $1^2 – 1$, $2^2 – 2$, $3^2 – 3$, $4^2 – 4$, $5^2 – 5$, $6^2 – 6$, $7^2 – 7$, $8^2 – 8$, and so on.

N^3 Series

Example-12
1, 8, 27, 64, 125, 216, ….
a) 256 (b) 343 (c) 365 (d) 400
Solution: The series is 1^3, 2^3, 3^3, etc. The missing number is $7^3 = 343$. (b)

$N^3 + 1$ Series

Example-13
2, 9, 28, 65, 126, 217, 344, ….
a) 512 (b) 362 (c) 369 (d) 361
Solution: The series is 1^3+1, 2^3+1, 3^3+1, and so on. Thus, the missing number is $8^3+1 = 513$. (a)

LOGICAL REASONING

Reasoning is an important section in aptitude tests and the one the student needs to master necessarily. To seek accurate explanation, we have to apply logic. Logic is applying principles of reasoning to obtain valid inferences. Logical reasoning is largely about adopting complete rational approach to solve a problem, with no chance for ambiguity.

Deductive and inductive reasoning

In deductive reasoning or inferencing, it is asserted that the conclusion is guaranteed to be true if the premises are true in the deductive inference, the conclusion cannot be more general than premises(s).

On the contrary, in inductive reasoning or inferencing, the conclusion has a high probability of being true if the premises are true. Thus, in inductive inference, the conclusion is more general than the premises(s)

In inductive reasoning, we can generalise beyond the known facts, but we can never be sure that the generalization is correct. It also means that true premises never guarantee truth of conclusion. Here, conclusion is just a likelihood.

Deductive Inference

Statement I: All vegetables contain vitamins.
Statement II: Carrot is a vegetable.
Conclusion: So carrot contains vitamins.

Inductive Inference

Statement I: Most vegetables contain vitamins.
Statement II: Carrot is a vegetable
Conclusion: So carrot contains vitamins.

Deductive inferences are further categorized into (i) immediate- where conclusion is drawn from a single statement and (ii) mediate (where conclusion is drawn from two statements, called syllogism).

Types of syllogism:

1. **Categorical:** Here, the relationship between the subject and the predicate is without any condition.
2. **Hypothetical:** The relationship between the subject and the predicate is asserted conditionally. For example, if it rains he will not attend.
3. **Disjunctive:** I. Either he is courageous or he is strong.
4. **Relational :** Here the relation between the various terms is shown in an order.

Structure of Arguments

Structure of arguments deals with basic terms, validity of arguments, converting sentences into their logical form depending on the requirement, and then application of rules follows so as to arrive at a conclusion.

Proposition

A proposition is a sentence that makes a statement and gives a relation between two or more terms. In logical reasoning, any statement is termed as a proposition.

A premise is a statement or proposition that is assumed to be true and from which a conclusion can be drawn.

Quantifier + Subject + Copula + Predicate

Thus, the proposition consists of four parts:

1. **Quantifier:** All, no, and some. They specify a quantity. 'All' and 'no, are universal quantifier and 'some' is a particular quantifier.
2. **Subject (S):** About which something is being said.
3. **Predicate(P):** Something that affirms or denies about the subject.
4. **Copula :** Relation between subject and predicate.

Examples:
All bats are boys
Some players are doctors.

Classification of Propositions

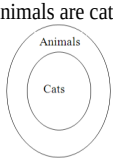
Propositions are basically of two types, namely, universal and particular. universal proposition is further divided into two parts:

1. Universal Positive or affirmative (A); It denotes inclusion.

Form: All S is P where S is the subject and P is the predicate. Example: 'All cats are animals'. It is basically about inclusion.

Distribution: It distributes the subject only. In the above statement, cats are distributed in animals.

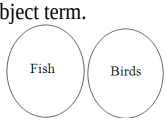
Predicate is not interchangeable with the subject while maintaining the validity of a proposition. We cannot say that all animals are cats.



2. Universal Negative (E): It denotes exclusion.

Form: No S is P. Example: 'No fish are birds' would be a universal negative.

Distribution: Both subject and predicate. Here, an entire class of predicate term is denied to the entire class of the subject term.

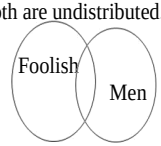


Particular Propositions: A particular proposition can also be divided into two parts.

1. **Particular Positive (I):**It denotes 'partial inclusion'.

Form: Some S is P. Example: Some men are foolish.

Distribution: Neither the subject nor the predicate. In the example, subject term, men is used not for all but only for some men and similarly the predicate term, foolish is affirmed for a part of subject class. So, both are undistributed.



2. **Particular Negative (O):**It denotes 'partial exclusion'.
   Form: Some S is not P or Not every S is P.
   Example: Some bird are not carnivores'.
   Distribution: Only of predicate.

Validity of Arguments

Deductive arguments may be either valid or invalid. If an argument is valid, it is a valid deduction, and if its premises are true, the conclusion must be true. **A valid argument cannot have true premises and a false conclusion**

Types and Main characteristics of Prepositions:

Sign	Statement form	Examples	Quantity	Quality	Distributed
A	All S are P	All politicians are liars	Universal	Positive	Only subject
E	No S are P	No politicians are liars	Universal	Negative	Both subject and predicate
I	Some S are P	Some politicians are liars	Particular	Positive	Neither subject nor predicate
O	Some S are not P	Some politicians are not liars	Particular	Negative	Only predicate

The conclusion of a valid argument with one or more false premises may be either true or false.

Logic seeks to discover the valid forms, the forms that make arguments valid A form of argument is valid if and only if the conclusion is true under all interpretations of that argument in which the premises are true. Since the validity of an argument depends solely on its form, an argument can be shown to be invalid by showing that its form is invalid. This can be done by giving a Counterexample of the same form of argument with premises that are true under a given interpretation, but a conclusion that is false under that interpretation. In informal logic, this is called a counterargument.

Certain examples would help in better clarification about validity of arguments.

1. **Some Indians are logicians; therefore some logicians are Indians.**
   Valid argument: It would be self contradictory to admit that some Indians are logicians but deny that some (any) logicians are Indians.
2. **All Indians are human and all humans are mortal; therefore, all Indians are mortal.**
   Valid argument: If the premises are true, the conclusion must be true.
3. **Some Indians are logicians and some logicians are tiresome; therefore, some Indians are tiresome.**
   Invalid argument: For example, the tiresome logicians might all be Chinese.

Remember that this does not mean the conclusion has to be true; it is only true if the premises are true, which they may not be.

The following examples would help to clarify this aspect about structure of arguments:

Premises:

I: Some men are lawyers

II: Some lawyers are rich.

Conclusions: Some men are rich.

This argument is invalid. There is a way where you can determine whether an argument is valid and give a counterexample with the same argument form.

Note: Logical strength and soundness are properties of statements (or premises or conclusions).Never say that argument is false' or that 'premise is logically strong'.

What is a counterexample? In logic, a counter example is an exception to a proposed general rule. For example, 'all students are (laziness) holds for all students, even a single example of diligent student will prove it false. Thus, any hardworking student is a counter-example to' all students are lazy'. More precisely, a counterexample is a specific instance of the falsity of a universal quantification.

Parts of Categorical Propositions

There are three parts of statements in categorical syllogism-major premise, minor premise, and conclusion, Each of the premise has one term in common with the conclusion.

Parts	Example
Major premise	All humans are mortal
Minor premise	All Greeks are humans
Conclusion	All Greeks are mortal

1. **Major premise:** Predicate of the conclusion is called as the major term. The premise containing major term is called major premise. In the example, mortal is the major term.
2. **Minor premise:** Subject of the conclusion is called minor term. The premise containing minor term is called minor premise. In the example, Greeks is the minor term.
3. **Middle Term:** One term common in both the premises is called middle term. It is not

Converting Common Language Statements into their Logical Forms

In logical reasoning or syllogism problems, the common language sentences may have to be converted into their logical form before we apply logic rules on them to draw a conclusion.

The rules of reduction can help in solving these types of questions.

1. **A-type propositions:** Statements starting with words 'each', 'every', 'any' etc. are to be treated as A-type propositions (starting with all)

Original sentence	Logical form
Every man is	All men are persons
liable to commit	who are liable to
error	commit mistakes
Each student	All students are persons
participated in the event	who participated in the event
Any one of the Indians is laborious	All Indians are laborious
Only Indians are students of this college	All students of this college are Indians
The honest alone are successful	All successful persons are honest.

2. **E-type propositions:** Sentences with singular term or definite singular term with the sign of negation are to be treated as E-type propositions. Sentences beginning with the words like 'no', 'never'. and 'none' are to be treated as E-type propositions.

'Never men are perfect' it 'No men are perfect' in its logical form.

3. **I-type propositions:** Affirmative sentences with words like 'a few', 'certain', 'most', and 'many' are to be treated as I-type propositions.

Sentence	Logical form
A few men are present	Some men are present
Most of the students are laborious	Some students are laborious
Few men are not selfish	Some men are selfish
Certain books are good	Some books are good
Man Indians are religious	Some Indians are religious
All students of my class, except a few, are well prepared	Some students of my class are well prepared
The poor may be happy	Some poor people are happy

4. O- type propositions: A negative can sentence that begins with a word like 'every', 'any, 'each', or 'all' is to be treated as an O-type proposition.	
Sentence	**Logical form**
Every man is not rich	Some men are not rich
Certain books are not readable	Some books are not readable
Most of the students are not rich	Some students are not rich
Some men are not above temptation	Few men are above temptation

5. Exclusive proposition

(a) In exclusive propositions, the subject is qualified with words like 'only', 'along', 'none but', or not one else but'.

(b) Here, the quantity is not explicitly stated.

(c) They can be reduced to A , E or-types by first interchanging the subject and worlds like 'only' or 'alone' with 'all'.

1. Exercise:

Statements

1. Intelligent alone are laborious.
2. Most of the girls are intelligent.

These statements should first be converted into logical forms according to the rules for logical form.

1. All intelligent are laborious. This is in the form B to C.
2. Some girls are intelligent. This is in the form A to B.

Just by changing their order, we can align them. After aligment is done, we move to Step it.

2. Exercise:

Statements

1. Some pens are books.
2. Some stationary are books

As books is the common term, they are in the form A to B and C to B. The first statement does not require any change. As the second statement is in Particular Positive (I-type), this can be changed to I-type only according to conversion table given earlier. The second statement will become, 'Some books are stationary'.

Now propositions are properly aligned that is, 'Some pens are books' and 'Some books are stationary'. We now move to Step II.

Rule of Syllogism

Proposition I(A to B)	**Proposition II(B to C)**	**Conclusion**	**Summarized form**
Universal Positive(A)	Universal Positive(A)	UniversalPositive (A)	A+A=A
	Universal Negative(E)	Universal Negative(E)	A+E=E
Universal Negative(E)	Universal Positive(A)	Particular negative(O)	E+A=O*
	Particular Positive(I)	Particular Negative(O)	E+I=O*
Particular Positive(I)	Universal Positive(A)	Particular Positive(I)	I+A=I
	Universal Negative(E)	Particular Negative(O)	I+E=O

LOGICAL REASONING MCQS

ALPHABET SERIES

1. BEH, DGJ, (?), EJO, GLQ, INS….?
A. FLR
B. FIS
C. FKO
D. FIL
Ans: D
Explanation:
There are two series BEH, DGJ, FIL and EJO, GLQ, INS. The first letter in every group of the series comes after a gap of one letter, i.e., B, D, F, and the second and third letters of each group have the same sequence, i.e., EGI and HJL. Same is the case with the second series.
2. APZLT, CQYNR, ERXPP, GSWRN….?
A. KVIJUJ
B. JUUVK
C. ITVTL
D. KUUVJ
Ans: C
Explanation:
The first letter in every group is ascending in the order of ACEGI. The second letter in every group is also ascending in the order of PQRST, the third letter in every group is descending in the order of ZYXWV, fourth letter in every group is ascending in the order of LNPRT and the last letter in every group is descending with a gap of one letter, i.e., TRPNL
3. RAP, MAP, HOT FUN,…?
A. HNE
B. PGI
C. STN
D. CAT
Explanation:
a, e, i, o, u are vowels and there is a vowel consonant relationship in every group of the series.
4. ZBAY, JRQI, OMLN, YCBX….?
A. DXWC
B. XCBY
C. VDEW
D. FUVE
Ans: A
Explanation:
Assign the numerical value of ZBAY, as 1, 2, 3, 4 we get

1st Term

Z	B	A	Y
26	2	1	25

2nd Term

J	R	Q	I	
10	18	17	9	
(+10)	(+5)	(+5)	(+10)	(going in forward direction)

Following this formula we get DXWC
5. CWE, FQH, RDI…..?
A. XBZ
B. TGU
C. MCO
D. FUT
Ans: C
Explanation:
Add the alphabetic numerical value of each letter in the group and then sum up the unit and tens which is equal to four everywhere, i.e., CWE = 3 + 23 + 5 = 31 which is equal to 3 + 1= 4, FQH = 6 + 17 + 8 = 31 (3 + 1) = 4 and so on.

ANALOGY

6. Light: Sun : : Heat : ?
A. Electricity
B. Moon
C. Fire
D. Star
Ans: C
Explanation:

Sun gives-light. In the same way Fire gives heat.
7. Handsome: Beautiful :: Husband : ?
A. Women
B. Wife
C. Girl
D. She
Ans: B
Explanation:
Handsome is related to Husband and Beautiful is related to Wife.
8. 3:10 : : 8 : ?
A. 10
B. 13
C. 17
D. 14
Ans: C
Explanation:
Ist term = 2^2 -1 =4 -1 =3
IInd term = 3^2 + 1 = 9 + 1 = 10
IIIrd term = 3^2 - 1= 9 - 1 = 8
IVth term = 4^2 + 1 = 16 + 1 = 17
9. Monday: April : : Friday : ?
A. July
B. Saturday
C. August
D. Tuesday
Ans: C
Explanation:
Fridays comes three days after Monday so three month after April will be August.
10. Parrot : Cage : : Man : ?
A. Home
B. Motor Car
C. Prison
D. Forest
Ans: C
Explanation:
Parrot is kept into Cage. Similarly Man is kept into Prison after trial

CODING-DECODING

11. If TOUR is written as 1234, CLEAR is written as 56784 and SPARE is written as 90847, find the code for CARE
A. 1247
B. 4847
C. 5247
D. 5847
Ans: D
Explanation:
R is in every group of letter and 4 is in every group of numbers so R = 4 C L E A R = 5 6 7 8 4 , S P A R E = 9 0 8 4 7 Here 847 are common So CL = 56 and SP = 90 Thus C A R E = 8 4 7
12. CALANDER is coded in a code as CLANAEDR. Find the code for CIRCULAR under the same rule.
A. LACANDER
B. CRIUCALR
C. CLANADER
D. None of these
Ans: B
Explanation:
C AL AN DE R = C IR CU LA R
C LA NA ED R = C RI UC AL R
Here first and last letters are not dispositioned but other pairs are being reversed
13. In a code sign DRLAL is coded as 62014314. How CAMEL is coded?
A. 5315714
B. 35729310
C. 5313613
D. None of these
Ans: A
Explanation:
Add two in the serial number of letters as:

D = 4th + 2 = 6
R= 18th + 2 = 20
L = 12th + 2 = 14
A = Ist + 2 = 3
L = 12th + 2 = 14

14. In a code language 35796 is written as 44887. Find the code for 46823.

A. 55914
B. 57194
C. 55934
D. 55745

Ans: A

Explanation:

3+1=4 of the code
5-1=4 of the code
7+1=8 of the code
9-1=8 of the code
6+1=7 of the code

as 3 5 7 9 6
+1 -1 +1 -1 +1
---
4 4 8 8 7

So 4 6 8 2 3
+1 -1 +1 -1 +1
---
5 5 9 1 4

15. If LIGHT is coded as GILTH, find the code for RAINY.

A. IARYN
B. ARINY
C. NAIRY
D. RINAY

Ans: A

Explanation:

There are two groups LIG and HT each being reversed
LIG HT - RAI, NY
GIL TH - IAR, YN

NUMBER SERIES

16. 8, 20, 36, 56, ..?

A. 80
B. 100
C. 64
D. 84

Ans: A

Explanation:

Every member of the series is, divisible by 4 and quotient is in the order of 2, 5, 9, 14, 20, i.e., it has an increasing trend with the difference of 3, 4, 5 and 6

17. 1, 8, 4, 27, 9,..?

A. 8
B. 9
C. 64
D. 16

Ans: C

Explanation:

There are two series, 13, 23, 33, 43, and 22, 32, 42

18. 3,6,8,16,18,..?

A. 28
B. 36
C. 54
D. 34

Ans: B

Explanation:

2nd number is twice of the first and fourth is twice of the third one. So 18 x 2 = 36

19. 17,13,11,7,5,?

A. -1

B. 1
C. 0
D. 2
Ans: B
Explanation:
There are three groups 17 ---13, 11--- 7, and 5----1. Besides every next group start by 2 less than its previous one
20. .....18, 28, 27,21,36,14…?
A. 30
B. 35
C. 23
D. 40
Ans: B
Explanation:
There are two series, 9,18,27,36 and 35,28,21,14

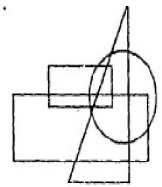
NUMERICAL REASONING

21. If 84 x 13 = 8, 37 x 13 = 6, 26 x 11 = 6 , then 56 x 22 = ?
A. 36
B. 39
C. 7
D. 11
Ans: C
Explanation:
(8 + 4) - (1 + 3) = 8,
(3 + 7) - (1 + 3) = 6 and
(5 + 6) - (2 + 2) = 7
22. If 3 x 6 = 18, 5 x 3 = 16, 8 x 2 = 20. Find the value of 4 x 6 = ?
A. 12
B. 13
C. 33
D. 20
Ans: D
Explanation:
(3 + 6) x 2 = 18,
(5 + 3) x 2 = 16,
(8 + 2) x 2 = 20
23. If + means divide, x means minus, + means multiply and - means plus, then find the value of 9 + 3 + 3 - 8 x 2?
A. 15
B. 17
C. 17 ½
D. 18
Ans: A
Explanation:
(i) 9 + 3 ÷ 4- 8 x 2
(ii) 9 ÷ 3 x 3 + 8 — 2
(iii) 9 x (1/3) x 3 + 8 — 2
(iv) 9 + 8 - 2 = 15
24. How many pillars are needed to construct a bridge of 300 meter long, if pillars are at a distance of 12 ½ meters each
A. 22
B. 24
C. 25
D. None of these
Ans: C
Explanation:
300 ÷ 25/2 + one pillar = 300 x 2/25 + one pillar = 25
25. What sign should be changed to make the equation 5 + 6 ÷ 3 - 12 x 2 = 17, correct?
A. + , ÷
B. - +
C. + x
D. None of these
Ans: D

REASONING ABILITY

26. On the basis of the diagram shown which statement do you consider correct?

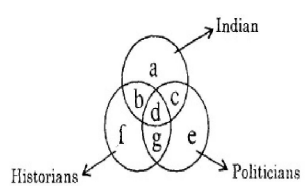
Square - Investors
Rectangle - Illiterates
Circle - Backward
Triangle - Farmers



A. Some farmers who are investors, they are either backward or illiterates or both.
B. Some non investor farmers are backward and illiterates.
C. Those backwards who are not illiterates are either farmers or investors or both.
D. All of these
Ans: C
Explanation:
Those backwards who are not illiterates are out of the rectangle that part belongs to triangle and square both.
27. In a group of five person a, B, C, D and E one plays Tennis, one plays Chess and one Hockey. A and D are unmarried women and· play no game. There is a couple among them where E is husband of C. No woman plays either Chess or Hockey. B is the brother of C and he neither plays Tennis nor Chess. Who plays Hockey here?
A. A
B. B
C. C
D. E
Explanation:
Out of five three are players. A and D are unmarried women and play no game. No women play chess or hockey. C is only woman excluding A and D. So she must be palying Tennis - B neither plays tennis nor chess. It means he must be playing hockey. The only player after B (male and C (female) is E so his game is chess. It is clear from the following table.

G	T	C	H	Un	Br	Hu	Wi
A	×	×	×	✓	×	×	×
B	×	×	✓		✓		
C	✓	×	×				
D	×	×	×	✓	×	×	×
E		✓				✓	

28. Points out the letter which represents Indians and historians but not politicians on the basis of these three' circles?



A. b
B. f
C. b and f
D. b and g
Ans: A
Explanation:
b letter is in the top circle as well as in the left hand circle but right hand circle is away from this letter.
29. On the basis of the figure in question above which of the following statements is not correct?
A. The area that represents the Indian historian who is a politician also is d.

B. f and e areas do not represent Indians.
C. c area represents Indian politician but not historian.
D. c is. not an area· representing politicians.
Ans: D
Explanation:
Area C is a part of the right hand circle so the statement is wrong.
30. A, Band C are intelligent, A, D and E are laborious and D, C and E are honest and A, B, and E are ambitious. Which of the following are not honest?
A. A and B
B. C and A
C. A and D
D. C, A and B
Ans: A
Explanation :
Put a right mark on the qualities that a particular member possesses as is done in the table here.

	Intelligent	*Laborious*	*Honest*	*Ambitious*
A	✓	✓		✓
B	✓			✓
C	✓		✓	
D		✓	✓	
E		✓	✓	✓

STATEMENT AND ARGUMENT

31. Statement: Should education be given by the government free of charge?
Arg. I: Yes, it will help in universalization of education in the country.
Arg. II: No, there will be budgetary deficit creating some new problems.
A. Statement & Argument I is strong
B. only argument II is strong
C. both the arguments are strong
D. neither I nor II is strong
Ans: C
Explanation:
Argument I follows because those who are unable to get education due to monetary problems, will get, if it is made free of charge, and argument II is also strong because it will require additional budget increasing financial
32. Statement: Should students study in early hours of morning?
Arg. I: Yes, mind is fresh and alert at that time.
Arg. II: No, early risers feel sleepy throughout the day.
A. only I is strong
B. only argument II is strong
C. both the arguments are strong
D. neither I nor II is strong
Ans: A
Explanation:
After sound sleep mind becomes fresh and alert.
33. Statement: Should the government stop aiding to minority institutions of education?
Arg. I: Yes, their poor quality as well as quantity of education is wasting the fund.
Arg. II: No, ruling party will lose its vote bank in the comming elections.
A. only I is strong
B. only argument II is strong
C. both the arguments are strong
D. neither I nor II is strong
Ans: A
Explanation:
It is a fact based on researches that quality as well as quantity of edcuation in minority institutions, barring a few, is extremely poor because of many reasons as compared to governments' institutions. If we compare the achievement with money invested it is less than 1/10th. So argument first is strong. Second argument is not strong because ruling party must act in accordance with the general welfare of the people disregarding its vote bank.
34. Statement: Should workers be alowed to participate in the management of factories in India?
Arg. I: Yes, it is the present management theory.
Arg. II: No, many workers are illiterate and their contribution will not be of value.
A. only I is strong
B. only argument II is strong
C. both the arguments are strong

D. neither I nor II is strong
Ans: B
Explanation:
A rule which is supported by a theory does not suit to all circumstances. So argument I is not strong but argument II is really a fact at least in India where literacy is not more than 50% while management require fine piece of education.
35. Statement: Should the political parties be banned?
Arg. I: Yes, it is necessary to teach a lesson to the politicians.
Arg. II: No, it will lead to an end of democracy.
A. only I is strong
B. only argument II is strong
C. both the arguments are strong
D. neither I nor II is strong
Ans: B
Explanation:
Argument II is strong because where there are no political parties there is no democracy.

STATEMENT AND ASSUMPTIONS

36. Ravi is too intelligent to fail in the examination.
Assumption I: Very intelligent boys do not fail in the examinations.
Assumption II: Those who are not intelligent at all may fail in the examinations.
A. assumption I is implicit
B. assumption II is implicit,
C. both I and II are implicit
D. neither of them is implicit.
Ans: C
Explanation:
Too intelligent means very intelligent so assumption I is implicit. On the other hand if someone is very much intelligent he rarely fails and that who is not intelligent at all may fail. So Assumption II is also implicit.
37. Crop condition continues to be critical before rains.
Assumption I: It is expected to improve after rain.
Assumption II: Unless it rains no change in crop condition is likely to be.
A. assumption I is implicit
B. assumption II is implicit,
C. both I and II are implicit
D. neither of them is implicit.
Ans: C

Explanation:
Crop is dependent on rains. Whatever problem the crop faces ceases to be after rains. Thus any improvement in crop condition is directly related to rains. If it does not rain its condition will continue to be critical. Thus both the assumptions are implicit.
38. Let the government increase the present rate of taxation to recover the deficit in the budget.
Assumption I: Present rate of taxes is very low.
Assumption II: If government wants to get away with the budgetary deficit it should increase tax rate.
A. assumption I is implicit
B. assumption II is implicit,
C. both I and II are implicit
D. neither of them is implicit.
Ans: B
Explanation:
There are many reasons behind budgetary deficits. Thus if the rate of tax is low even then it cannot be said that deficit is the product of low tax rate. In this way first assumption is not implicit but II one is implicit as taxes are a good source of finance to cover the deficit.
39. Go by aeroplane from Delhi to Chennai to reach quickly.
Assumption I: Delhi and Chennai are connected by air services.
Assumption II: There is no other means of going from Delhi to Chennai.
A. assumption I is implicit
B. assumption II is implicit,
C. both I and II are implicit
D. neither of them is implicit.
Ans: A
Explanation:
One is suggested to go to Chennai from Delhi by aeroplane. It means both the cities are connected by air services. But the word 'quickly' used in the statement clarifies that there are other means of transportation also. So only assumption I is implicit.
40. Indian scientists working abroad do not come back and serve their motherland.

Assumption I: India lacks such highly sophisticated labs, instruments and other amenities as they have there.
Assumption II: India cannot afford to pay them as much as they get there.
A. assumption I is implicit
B. assumption II is implicit,
C. both I and II are implicit
D. neither of them is implicit.
Ans: C
Explanation:
Both are the genuine reason that is why they do not come back here.

STATEMENT AND CONCLUSION

41. Statement: Since the feeling of superiority is built in wherever there is social development, there is a little that can be done to arrest it except at the cost of social development.
Con. I: To maintain social development complex should be allowed to continue.
Con.II: Social development and complex run side by side.
A. only conclusion I follows
B. only conclusion II follows.
C. both I and II follow
D. neither I nor II follows
Ans: C
Explanation:
If we remove superiority complex from the mind of the people we will jeopardize social development.
42. Statement : A maladjusted is a non- criminal who commits crime for the sake of adjustment.
Con. I: Some crimes have their root cause in adjustment problems.
Con.II: Maladjustment and delinquency go hand in hand.
A. only conclusion I follows
B. only conclusion II follows.
C. both I and II follow
D. neither I nor II follows
Ans: C
Explanation:
Both the conclusions can be drawn from the statement but only one conclusion will be correct at one time. Thus either I follow or II follows.

43. Statement: The oceans are store house of practically every mineral including, $^{238}U_{92}$. But like most other minerals it is found in extremely low concentration about 3 grams per 1000 tons of water.
Con. I: Sea water contains silver and iron.
Con.II: Gold is found about 3 grams per 1000 tons of water.
A. only conclusion I follows
B. only conclusion II follows.
C. both I and II follow
D. neither I nor II follows
Ans: A
Explanation:
Every mineral is found in oceans and also in low concentrations but second conclusion does not follow because all minerals are not found in the same concentration. 3 grams per 1000 tons of water concentration has been used exclusively for $^{238}U_{92}$
44. Statement: No new tax has been proposed in the budget of 2011-12. It is still a surplus budget.
Con. I: The budget of 2011-12 may be considered a good budget.
Con.II: 2011-12 budget is a surplus budget because no new tax has been proposed.
A. only conclusion I follows
B. only conclusion II follows.
C. both I and II follow
D. neither I nor II follows
Ans: A
Explanation:
If burden of tax does not increase even then it is able to meet the budgetary requirement of the government, it is a good budget.
45. Statement: The essence of one day cricket is the ability to score runs fast and to bowl with a mixture of control and aggression which adroitly handled can tie the opponent hand and foot.
Con. I: Kapil Dev who won the World Cup in 1983 had all the above qualities.
Con.II: Aggressive bowling as well as fast scoring of runs are equally indispensable to win a one day cricket match.
A. only conclusion I follows
B. only conclusion II follows.
C. both I and II follow
D. neither I nor II follows
Ans: B

Explanation:
Conclusion I is not implicit because there is no reference of a particular cricketer in the statement.

STATEMENT AND INFERENCE

46. (a) My son is not old enough to vote.
(b) My son has handsome personality.
Inference: My son is a boy under 18 years of age.
A. the inference is definitely true
B. the inference is definitely false
C. the inference is probably false or true
D. inference cannot be drawn
Ans: C
Explanation:
The voting age has not been given here. So we cannot definitely say about the age of the child. We can only assess the boy on the basis of the voting age common in India and boys of this age generally have handsome personality.
47. (a) Either he is happy or he is poor.
(b) He is happy.
Inference: He is poor.
A. the inference is definitely true
B. the inference is definitely false
C. the inference is probably false or true
D. inference cannot be drawn
Ans: B
Explanation:
The correct inference is "he is not poor".
48. (a) I know a professor of a university.
(b) He has beard.
Inference: All the professors of the university have beard.
A. the inference is definitely true
B. the inference is definitely false
C. the inference is probably false or true
D. inference cannot be drawn
Ans: B
Explanation:
I know only one professor who has beard and other professors are not known to me. So the conclusion must be false. And the inference that "some professors of the university have beard" is probably false or probably true.
49. (a) Those who are honest are good teachers.
(b) Hard working people are honest
Inference: Hard work is the necessary quality of a good teacher.
A. the inference is definitely true
B. the inference is definitely false
C. the inference is probably false or true
D. inference cannot be drawn
Ans: C
Explanation:
All hard working people are honest and honest are good teachers. So hard work is the quality of a good teacher but it is not the only quality that he must have. There are other quaities needed by him to be a good teacher. It is probably not true because the criteria of necessary qualities have not been given here.
50. (a) L is the brother of K.
(b) K is the friend of M.
Inference: L is the friend of M.
A. the inference is definitely true
B. the inference is definitely false
C. the inference is probably false or true
D. inference cannot be drawn
Ans: C
Explanation:
There are four terms.

UNIT – 7

DATA INTERPRETATION

UNIT 7: DATA INTERPRETATION

Directions (1–5): This data is regarding total number of employees working in Administration (admin), Operations (Ops.) and other departments of corporate divisions of Companies A and B.

The total number of employees working in both the companies together is 4800. The respective ratio of number of employees in Companies A and B is 5 : 7. Each employee works in only one of the 3 Departments

i.e. "ops", "Admin" and "others".

In company A, 70% of the total employees are males. 60% of the total male employees work in 'Ops' out of the remaining male employees, $\frac{1}{8}$ th work in 'Admin'. Out of the total female employees, 24% work in 'Admin' and $\frac{5}{8}$th of the remaining female employees work in 'Ops'.

In company B, 80% of the total employees are males. 65% of the total male employees work in 'Ops'. Number of male employees who work in other departments in Company B is 20% more than the male employees who work in 'Other Departments' in company A. Number of female employees who work in Ops in Company B are less than the number of male employees who work for 'Ops' in the same company by 75%. Out of the remaining female employees, $\frac{1}{4}$ work in 'Admin'.

Q1. What per cent of the total number of male employees in company A work in 'other' departments?

(a) 45 (b) 25 (c) 30
(d) 35 (e) 40

Q2. What per cent the total number of female employees in company B work in administration department?

(a) 18.5 (b) 8.75 (c) 14
(d) 16 (e) 19

Q3. What is the total number of female employees who work on Ops in Company A and B together?

(a) 681 (b) 781 (c) 689
(d) 649 (e) 788

Q4. What is the difference between the average number of males working in 'Admin' in both the companies together and average number of females working 'Other Departments' in both the companies together?

(a) 26 (b) 36 (c) 16
(d) 24 (e) 14

Q5. In company B, what is the respective ratio between the total number of employees (both male and female) who work in 'Admin' and the total number of employees (both male and female) who work in 'Other Department' in the same company?

(a) 2 : 3 (b) 1 : 3 (c) 1 : 4
(d) 3 : 5 (e) 1 : 5

Solution(1-5):

For company A , Total = 2000

	Male (1400)	Female (600)
Ops	840	285
Admin	70	144
Other	490	171

For Company B –, Total = 2800

	Male (2240)	Female (560)
Ops	1456	364
Admin	196	49
Other	588	147

S1. Ans.(d)

Sol. Required % = $\frac{490}{1400} \times 100 = 35\%$

S2. Ans.(b)

Sol. Required % = $\frac{49}{560} \times 100 = 8.75\%$

S3. Ans.(d)

Sol. Required no. of female = 285 + 364 = 649

S4. Ans.(a)

Sol. Required difference = $\frac{171+147}{2} - \frac{70+196}{2}$

= 159 – 133

= 26

S5. Ans.(b)

Sol. Required Ratio = (196 + 49) : (588 + 147)

= 245 : 735

= 1 : 3

Directions (6-10): Study the table and answer the given questions.

Data related to Human Resource Dept. of a multinational company (X) which has 145 offices across 8 countries.

Countries	Offices	Total Employees	Respective Ratio of male & female employees	% of post graduate
A	16	2568	5 : 7	75
B	18	2880	11 : 5	65
C	14	2310	10 : 11	40
D	22	3575	3 : 2	60
E	13	2054	7 : 6	50
F	17	2788	20 : 21	75
G	24	3720	8 : 7	55
H	21	3360	8 : 6	80

Q6. The number of male post graduate employees in country H is 1800. If number of female post graduates increase by 50% in the next year, what % of female employees in that particular country is post graduate? (Given that all other data remain same)

(a) 76.8% (b) 74% (c) 92.5%
(d) 90% (e) 80%

Q7. In which country, is the percentage of women employees to number of employees (both male & female) is ranked third lowest?

(a) E (b) B (c) H
(d) F (e) A

Q8. What is the ratio between total number of male employees in countries B and H together and total number of post graduate employees in same countries?

(a) 76 : 65 (b) 86 : 85 (c) 75 : 76
(d)65 : 76 (e)12 : 33

Q9. What is the difference between average number of post graduate employees in countries A, B and D together and average number of post graduate employees in countries F, G and H together?

(a) 294 (b) 282 (c) 284
(d) 280 (e) 200

Q10. Which country has the 2nd highest number of average employees per office?

(a) D (b) H (c) G
(d) A (e) F

S6. Ans.(c)

Sol.

Graduate = $3360 \times \frac{4}{5} = 2688$

Female graduate = 2688 – 1800 = 888

Female employee = $3360 \times \frac{6}{14} = 1440$

Female graduate next year = $888 \times \frac{3}{2} = 1332$

% of female graduate $= \frac{1332}{1440} \times 100 = 92.5\%$

S7. Ans.(c)

Sol.

A ⇒ $\frac{7}{12} \times 100 = 58.34\%$ B ⇒ $\frac{5}{16} \times 100 = 31.25\%$

C ⇒ $\frac{11}{21} \times 100 = 52.4\%$ D ⇒ $\frac{2}{5} \times 100 = 40\%$

E ⇒ $\frac{6}{13} \times 100 = 46.15\%$ F ⇒ $\frac{21}{41} \times 100 = 51.22\%$

G⇒ $\frac{7}{15} \times 100 = 46.67\%$ H ⇒ $\frac{6}{14} \times 100 = 42.86\%$

Clearly, H is the third lowest.

S8. Ans.(d)

Sol.

$$\frac{\frac{11}{16} \times 2880 + \frac{8}{14} \times 3360}{2880 \times \frac{65}{100} + 3360 \times \frac{4}{5}} = \frac{1980 + 1920}{1872 + 2688} = \frac{3900}{4560}$$

= 65 : 76

S9. Ans.(a)

Sol.

A ⇒ $2568 \times \frac{3}{4} = 1926$ F ⇒ $2788 \times \frac{3}{4} = 2091$

B ⇒ $2880 \times \frac{65}{100} = 1872$ G ⇒ $3720 \times \frac{55}{100} = 2046$

D ⇒ $3575 \times \frac{3}{5} = 2145$ H ⇒ $3360 \times \frac{4}{5} = 2688$

A + B + D = 5943 F + G + H = 6825

Diff. = 6825 – 5943 = 882

Avg. = $\frac{882}{3} = 294$

S10. Ans.(e)

Sol.

A ⇒ $\frac{2568}{16} = 160.5$ B ⇒ $\frac{2880}{18} = 160$ C ⇒ $\frac{2310}{14} = 165$

D ⇒ $\frac{3575}{22} = 162$ E ⇒ $\frac{2054}{13} = 158$ F ⇒ $\frac{2788}{17} = 164$

H ⇒ $\frac{3360}{21} = 160$ G ⇒ $\frac{3720}{24} = 155$

2nd highest avg. no. of employees per office = F

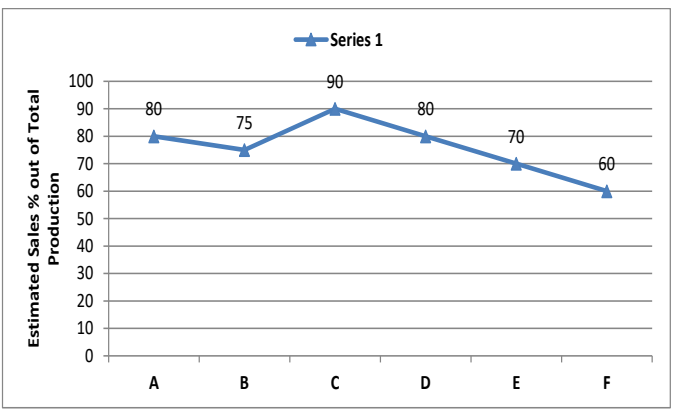
Directions (11-15): The table given below shows the no. of units produced of six different items by a company, the mark-up % on each unit and the discount offered on the marked-up price of each unit.

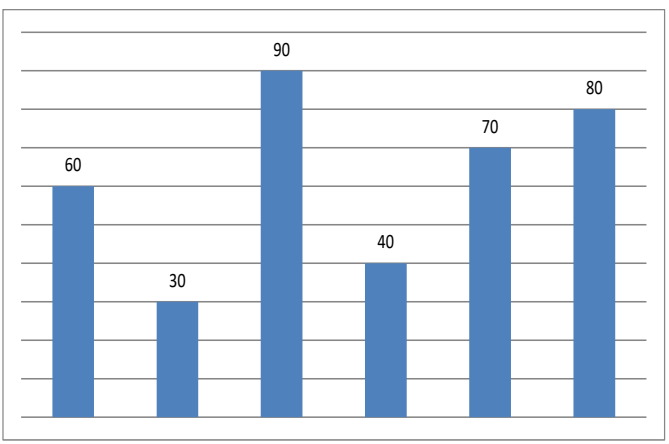
The cost price of all the items is same and fixed at Rs 100.

The line graph shows the estimated percentage of items sold by the company on the normal discounted price.

The bar graph shows the percentage of cost price at which the company sold the remaining no. of items.(means the company sold the remaining no. of items at a price lower than the cost price)

	A	B	C	D	E	F
Production Unit	200	160	80	140	180	150
Mark Up %	50	60	80	40	60	45
Discount %	20	25	40	15	20	20





Q11. Find profit % of A and B together in year 2015if it is known that B sold only 90% of goods of what he actually estimated to sell in year 2015.

(a) 0.33% (b) 0.44% (c) 0.55%
(d) 0.60% (e) None of these

Q12. In year 2016 E has increased his discount % by 10 basis point and which lead to increasein its estimated salesby 20 basis point. Apart from that everything else remains same then what is the difference in profit in year 2015 to 2016.

(a) 504 (b) 508 (c) 512
(d) 516 (e) 520

Q13. In year 2016 C decreased the discount % by 10 basis point due to which its sales reduced to 80% of total production of year 2015. By how much % profit will increase or decrease in 2016 compare to year 2015. (Approximately)

(a) Increased by 200% (b) Decreased by 210% (c) Increased by 203%
(d) Increased by 207% (e) Decreased by 207%

Q14. What is the difference between the absolute profit of A, B and C together and D, E and F together in year 2015

(a) 750 (b) 800 (c) 900
(d) 1000 (e) None of these

Q15. What is the profit % of all the companies together in year 2015. (Approximately)

(a) 4.9% (b) 4.6% (c) 5.1%
(d) 4.7% (e) 5.4%

S11. Ans.(a)

Sol.

A's selling price per unit = $\frac{100\times150}{100}\times\frac{80}{100}=120$

A's sales in unit = $200\times\frac{80}{100}=160$

A's SP of 160 Unit = $160\times120=19200$

A's SP of Remaining unit = $(200-160)\times100\times\frac{60}{100}=2400$

B's Selling price per unit = $\frac{100\times160}{100}\times\frac{75}{100}=120$

B's Sales in Unit = $\left(160\times\frac{75}{100}\right)\times\frac{90}{100}=108$

B's total SP = $108\times120+\left[(160-108)\times100\times\frac{30}{100}\right]=14520$

Total SP (A + B) = 19200 + 2400 + 14520 = 36120

Total CP (A + B) = (200 + 160) × 100= 36000

Required Profit % = $\left(\frac{36120-36000}{36000}\right)\times100=0.33\%$

S12. Ans.(a)

Sol.

E's total SP in year 2016

$= \left[\left(100 \times \frac{160}{100}\right) \times \frac{70}{100}\right] \times \left(180 \times \frac{90}{100}\right) + \left(100 \times \frac{70}{100} \times \frac{180 \times 10}{100}\right)$

$= 19404$

E's total SP in year 2015

$= \left[\left(100 \times \frac{160}{100}\right) \times \frac{80}{100}\right] \times \left(180 \times \frac{70}{100}\right) + \left(100 \times \frac{70}{100} \times \frac{(180 \times 30)}{100}\right)$

$= 19908$

Required answer = 19908 − 19404

= 504

S13. Ans.(c)

Sol.

SP of C in year 2016

$= \left[\left(100 \times \frac{180}{100}\right) \times \frac{70}{100}\right] \times \left(80 \times \frac{80}{100}\right) + \left(80 \times \frac{20}{100}\right) \times \left(100 \times \frac{90}{100}\right)$

$= 9504$

Profit of C in year 2016 = 9504 − 80 × 100

= 1504

SP of C in year 2015 $= \left[\left(100 \times \frac{180}{100}\right) \times \frac{60}{100}\right] \times \left(80 \times \frac{90}{100}\right) + \left(80 \times \frac{10}{100}\right) \times \left(100 \times \frac{90}{100}\right)$

$= 8496$

Profit of C in year 2015 = 8496 − 80 × 100

= 496

Required % $= \frac{1504-496}{496} = 203.22\% \sim 203\%$

S14. Ans.(c)

Sol.

A's SP in year 2015

$= \left(200 \times \frac{80}{100}\right) \times \left(100 \times \frac{150}{100} \times \frac{80}{100}\right) + \left(200 \times \frac{20}{100}\right) \times \left(100 \times \frac{60}{100}\right)$

$= 21600$

B's SP in year 2015 =

$= \left(160 \times \frac{75}{100}\right) \times \left(100 \times \frac{160}{100} \times \frac{75}{100}\right) + \left(160 \times \frac{25}{100}\right) \times \left(100 \times \frac{30}{100}\right)$

$= 15600$

C's SP in year 2015 s

$= \left(80 \times \frac{90}{100}\right) \times \left(100 \times \frac{180}{100} \times \frac{60}{100}\right) + \left(80 \times \frac{10}{100}\right) \times \left(100 \times \frac{90}{100}\right)$

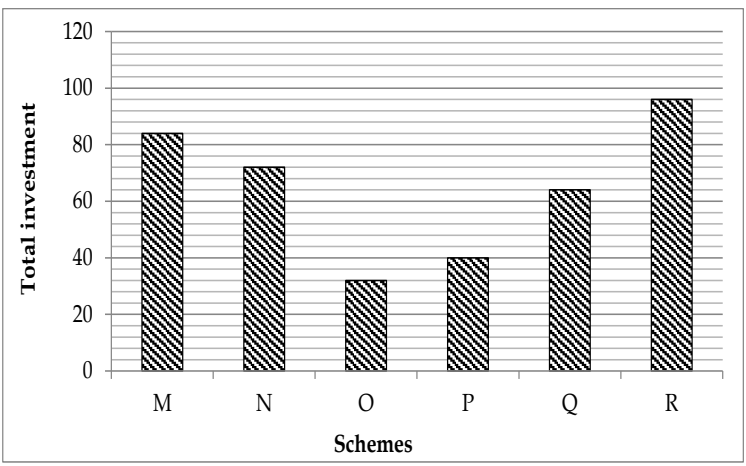
$= 8496$

Total (A + B + C) = 21600 + 15600 + 8496 = 45696
Profit = 45696 – 20000 – 16000 – 8000 = 1696
D's SP in year 2015 = $\left(140 \times \frac{80}{100}\right) \times \left(100 \times \frac{140}{100} \times \frac{85}{100}\right) + \left(140 \times \frac{20}{100}\right) \times \left(100 \times \frac{40}{100}\right)$
= 14448
E's SP in year 2015 = $\left(180 \times \frac{70}{100}\right) \times \left(100 \times \frac{160}{100} \times \frac{80}{100}\right) + \left(180 \times \frac{30}{100}\right) \times \left(100 \times \frac{70}{100}\right)$
= 19908
F's SP in year 2015 = $\left(150 \times \frac{60}{100}\right) \times \left(100 \times \frac{145}{100} \times \frac{80}{100}\right) + \left(150 \times \frac{40}{100}\right) \times \left(100 \times \frac{80}{100}\right)$
= 15240
Total SP (D + E + F) = 1448 + 19908 + 15240
= 49596
Profit = 49596 – 14000 – 18000 – 15000
= 2596
Required answer = 2596 – 1696
= 900

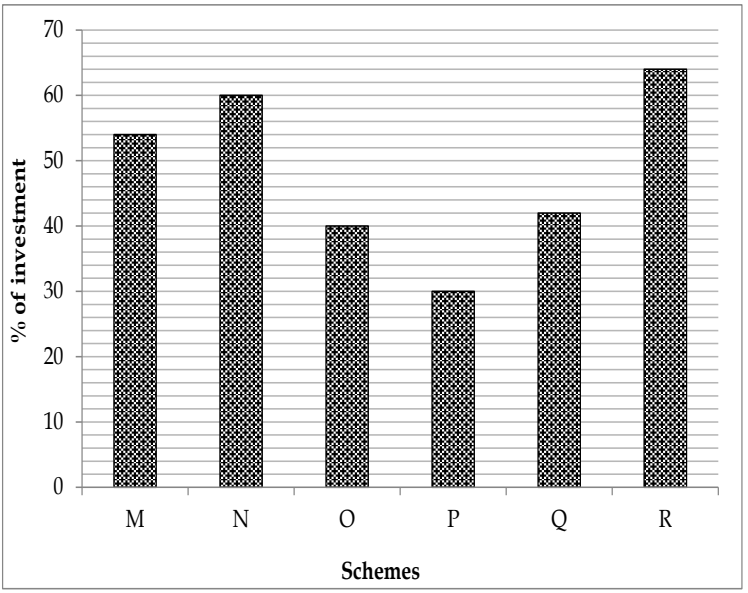
S15. Ans.(d)
Sol.
total profit = 2596+ 1696
= 4292
Total CP = 20000+ 16000+ 8000 + 14000 + 18000+ 15000
= 91000
Required profit % = $\frac{4292}{91000} \times 100$
= 4.716 ~ 4.72%

Direction (16-20): Study the graph to answer the questions.

Total investment (in Rs. thousand) of Gaurav and Rishabh in 6 schemes (M, N, O, P,Q and R) investment



Percentage of Gaurav's Investment out of total investment



Q16. Scheme M offers simple interest at a certain rate of interest (per cent per annum). If the difference between the interest earned by Gaurav and Rishabh from scheme M after 4 yr is Rs. 4435.20, what is the rate of interest (per cent per annum)?

(a) 17.5 (b) 18 (c) 16.5
(d) 20 (e) 15

Q17. What is the respective ratio between total amount invested by Gaurav in schemes O and Q together and total amount invested by Rishabh in the same scheme together?

(a) 31 : 44 (b) 31 : 42 (c) 27 : 44
(d) 35 : 48 (e) 29 : 38

Q18. If scheme O offers compound interest (compounded annually) at 12% per annum, then what is the difference between interest earned by Gaurav and Rishabh from scheme O after 2 yr?

(a) Rs. 1628.16 (b) Rs. 1584.38 (c) Rs. 1672.74
(d) Rs. 1536.58 (e) Rs. 1722.96

Q19. Rishabh invested in scheme R for 4 yr. If scheme R offers simple interest at 7% per annum for the first two years and then compound interest at 10% per annum (compound annually) for the 3rd and 4th year, then what will be the interest earned by Rishabh after 4 yr?

(a) Rs. 13548.64 (b) Rs. 13112.064 (c) Rs. 12242.5
(d) Rs. 12364 (e) Rs. 11886

Q20. Amount invested by Gaurav in scheme S is equal to the amount invested by him in scheme N. The rate of interest per annum of schemes S and N are same. The only difference is scheme S offers compound interest (compounded annually), whereas the scheme N offers simple interest. If the difference between the interest earned by Gaurav from both the schemes after 2 yr is Rs. 349.92, then what is the rate of interest?

(a) 9% (b) 5% (c) 13%
(d) 11% (e) 7%

S16. Ans.(c)
Sol.
Amount invested by Gaurav in scheme M = 54% of 84000
= Rs. 45360
∴ Amount invested by Rishabh in scheme M = 84000 – 45360
= Rs. 38640
Let the required rate be r% per annum. Then,

$$= \frac{45360 \times r \times 4}{100} - \frac{38640 \times r \times 4}{100} = 4435.20$$

⇒6720 × r × 4 = 443520
⇒ r = 16.5%

S17. Ans.(a)
Sol.
Required ratio = (Total amount invested by Gaurav in schemes O and Q together) : (Total amount invested by Rishabh in schemes O and Q together)
= (40% of 32000 + 42% of 64000) : (60% of 32000 + 58% of 64000)
= 39680 : 56320 = 31 : 44

S18. Ans.(a)
Sol.
Difference of amount invested by Gaurav and Rishabh in
Scheme O = 60% of 32000 – 40% of 32000 = 20% of 32000
= Rs. 6400
∴ Required difference in their interest

$$= 6400\left[\left(1 + \frac{12}{100}\right)^2 - 1\right] = 6400 \times 0.2544 = Rs.1628.16$$

S19. Ans.(b)
Sol.
Amount invested by Rishabh in investment R
= (100 – 64)% of 96000 = 36% of 96000 = Rs. 34560
Then, total interest earned by Rishabh after 4 year

$$= \frac{34560 \times 7 \times 2}{100} + 21\% \text{ of } (34560 + \text{SIoffirst 2 years})$$

= 4838.40 + 8273.664 = Rs. 13112.064

S20. Ans.(a)

Sol.

Amount invested by Gaurav in each of scheme S and N

= 60% of 72000 = 43200

Let the rate of interest be r% per annum.

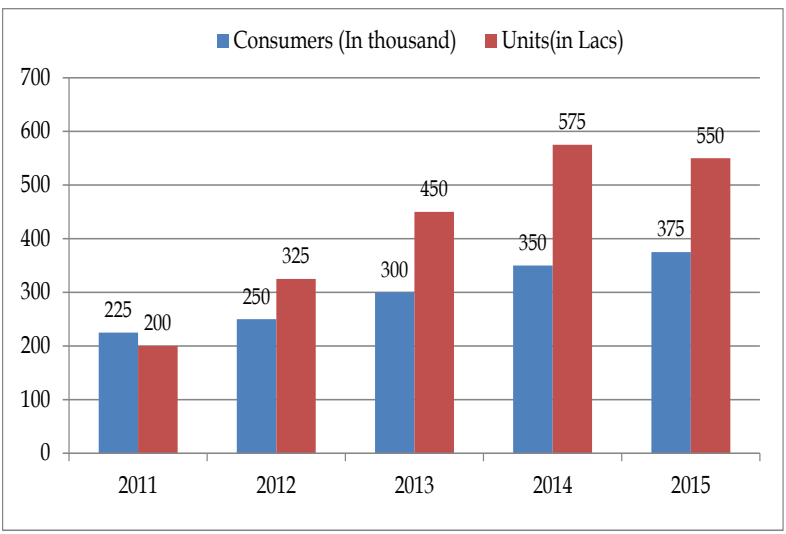
Then, according to the question,

$$349.92 = \frac{43200 \times r^2}{100^2}$$

$or, r^2 = 81$

$\therefore r = 9\%$

Directions (21–25): The graph suggests the no. of consumers and consumption of electricity units in five years. Electricity units are given in Lacs while the no. of consumers aregiven in thousand. Read the graph and answer the question.



Q21. What is the ratio of electricity consumption per consumer in 2012 to the same in 2015?

(a) 39 : 44 (b) 77 : 79 (c) 11 : 19

(d) 9 : 7 (e) None of the above

Q22. If no of consumers in 2016 is 120% more than in 2011 while the consumption remain same as in 2015, then what will be the impact of no of units consumed by a consumer in 2016 when compared to electricity consumption per consumer in 2015?

(a) + 42 units (b) + 36 Units (c) – 36units

(d) – 42 units (e) None of the above

Q23. Electricity consumption in 2012 will be approximately how many times the total no. of consumer all over the years?

(a) 3 (b) 21.5 (c) 2.5
(d) 4 (e) None of the above

Q24. Total no of units in 2011 and 2013 are approximately what % more or less than Total units in 2012 & 2014 together?

(a) 20% more (b) 24% more (c) 29% less
(d) 28% less (e) None of the above

Q25. In which of the following year, the ratio of unit consumtion to the no. of consumers is maximum?

(a) 2011 (b) 2015 (c) 2014
(d) 2013 (e) 2012

S21. Ans.(a)

Sol.

$$\frac{\frac{325}{250}}{\frac{550}{375}} = \frac{325 \times 375}{250 \times 550} = 39 : 44$$

S22. Ans.(c)

Sol.

2016 : No. of consumers = $\frac{220}{100}[225] = 495$ thousand

Electricity consumption = 550 Lacs

$\therefore$ Electricity consumption per consumer = $\frac{550\times100000}{495\times1000}$

= 111 units per consumer

2015 : Electricity consumption per consumer = $\frac{550\times100000}{375000}$

$\approx$ 147 units per consumer

Hence, the Impact is reduction of 36 units per consumer

S23. Ans.(b)

Sol.

Total consumer all over the year = 225 + 250 + 300 + 350 + 375 = 1500 thousand

Desired value = $\frac{325\times100000}{1500000}$ = 21.5 times approx

S24. Ans.(d)

Sol.

Total units in 2011 and 2013 = 650 Lacs

Total units in 2012 and 2014 = 900 Lacs

Desired value = $\frac{250}{900} \times 100 \approx$ 28%approx

S25. Ans.(c)

Sol. It is clear from the graph that unit consumption is highest in 2014 while consumers-electricity units difference is maximum as well. Hence, Ratio of unit consumption to the number of consumers is maximum in 2014.

Directions (26-30): The following information is about performance of Akhilesh in SBI PO mains exam. Read the information carefully and answer the following question.

The exam consists of 200 marks, with 5 sections i.e. Reasoning, quant, English, G.A., Computers. Akhilesh attempted 22 questions in Reasoning with an accuracy of $77\frac{3}{11}\%$. Each question of reasoning consists of 2 marks with a negative marking of 25%. (if right question is of 2 mark, then 0.5 mark will be deducted for each wrong answer).

Each section of the exam have the 25% of negative marking for each wrong question. The total number of questions in reasoning is 30. Each question of computer consists of $\frac{1}{2}$ marks and maximum marks in computer are 10. Total 16 questions are attempted by Akhileshin computer with the ratio of right questions to wrong questions 3 : 1.

The number of questions in English is equal to maximum marks of English. Akhilesh attempted 26 questions with 50% accuracy. The number of questions attempted in English is 65% of the total number of questions in English.

GA section consists of 40 questions with each question 0.75 marks. Akhilesh attempted 23 questions out of which 8 are wrong. Quant section contains 40 questions out of which Akhilesh attempted 35 questions and got 52.5 marks.

Q26. Another student arunoday attempted 70% questions in the same exam, then find the number of questions left by arunoday.

(a) 119 (b) 68 (c) 51
(d) 65 (e) None of these

Q27. Find the marks obtained by Akhilesh in GA.

(a) 8.75 (b) 9.25 (c) 9.75
(d) 10.75 (e) None of these

Q28. The number of correct questions in reasoning is how much more than the number of incorrect questions in the same subject?

(a) 12 (b) 7 (c) 18
(d) 9 (e) None of these

Q29. Find the total marks obtained by Akhilesh in the exam.

(a) 101 (b) 105 (c) 109
(d) 102 (e) None of these

Q30. Find the total number of incorrect questions attempted by Akhilesh in the exam.

(a) 27 (b) 15 (c) 28

(d) 18 (e) None of these

S26. Ans.(c)

Sol. Total number of question = 170, no of questions left= 170 – 119=51

S27. Ans.(c)

Sol. Marks in GA = 9.75

S28. Ans.(a)

Sol. 17 – 5 = 12

S29. Ans.(c)

Sol. Total marks obtained = 109

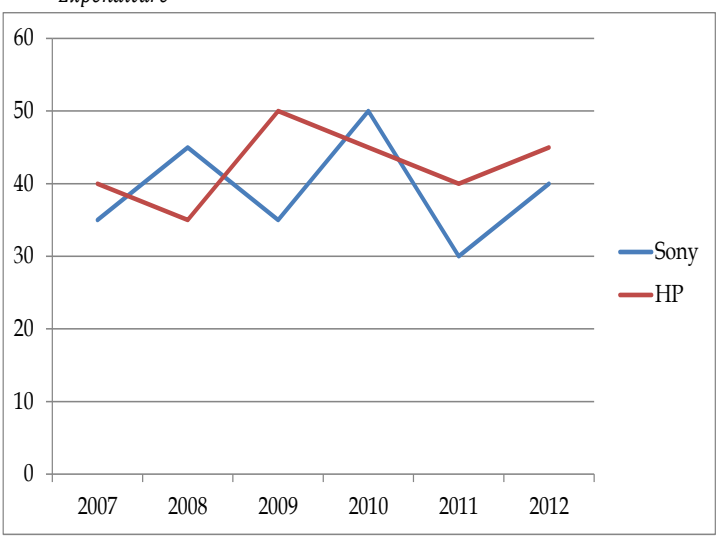
S30. Ans.(e)

Sol. Total number of incorrect questions = 122 – 85=37

Directions (31-35): Study the following graph carefully and answer the questions given below it.

Percentage of profit earned by two companies Sony and H.P. over the given years

$$\%\ Profit\ = \frac{Income - Expenditure}{Expenditure} \times 100$$



Q31. Expenditure of Company HP in 2008 and 2009 are Rs. 12 lakhs and Rs. 14.5 lakh respectively. What was the total income of Company B in 2008 and 2009 together (in lakh rupees)?

(a)35 lac (b)37.65 lac (c)40 lac

(d)37.95 lac (e)None of these

Q32. Ratio of expenditure of companies Sony and HP in 2011 was 3 : 4 respectively. What was the respective ratio of their incomes in 2011?

(a)2 : 3 (b)23 : 37 (c)43 : 56

(d)29 : 46 (e)39 : 56

Q33. Total expenditure of Company Sony in all the years together was 82.5 lakhs. What was the total income of the Company in all the years together?

(a)38 lac (b)40 lac (c)45 lac

(d) Cannot determined (e)None of these

Q34. If the expenditures of Companies Sony and HP in 2012 were equal and the total income of the two companies was Rs. 5.7 lakh, What was the total expenditure of the two companies in 2012?

(a)4 lac (b)5 lac (c)6 lac

(d)8 lac (e)10 lac

Q35. If the income of Company HP in 2009 and 2010 were in the ratio of 2 : 3 respectively. What was the respective ratio of expenditure of that Company in these two years?

(a) 2 : 3 (b)4 : 5 (c)29 : 45

(d)39 : 55 (e)None of these

S31. Ans.(d)

Sol.

Income of HP = I_1 in 2008

$\therefore 35 = \frac{I_1 - 12}{12} \times 100$

I_1 = Rs. 16.2 L

In 2009, Let Income = I_2

$\therefore 50 = \frac{I_2 - 14.5}{14.5} \times 100$

I_2 = 21.75 L

$\therefore$total income = $21.75\,L + 16.2\,L = 37.95\,L$

S32. Ans.(e)

Sol.

Let the respective expenditures of both Sony and HP be Rs. $3x$ and Rs. $4x$ lakhs.

$\therefore I_{sony} in\ 2011 \Rightarrow 30 = \frac{I_1 - 3x}{3x} \times 100$

or, $I_1 = 3.9x$

$Again, I_{HP}\ in\ 2011 \Rightarrow 40 = \frac{I_2 - 4x}{4x} \times 100$

$\Rightarrow I_2 = 5.6x$

Desired ratio $\Rightarrow I_{sony} : I_{HP} = 3.9x : 5.6x$

=39 : 56

S33. Ans.(d)

Sol. It can't be determined as data given are inadequate.

S34. Ans.(a)

Sol.

Let expenditure of both Sony and HP in 2012 beRs. x lakhs & their respective incomes be Rs. I_1&I_2 lakhs.

∴ Profit% for Sony = 40

& Profit% for HP = 45

$\therefore 40 = \frac{I_1 - x}{x} \times 100 \quad ...(i)$

$\&45 = \frac{I_2 - x}{x} \times 100 \quad ...(ii)$

From (i) and (ii)

x = Rs. 2L

∴ Total expenditure = 2 × 2 = Rs. 4 lakh

S35. Ans.(c)

Sol.

Let the income be Rs. $2x$and Rs. $3x$lakhs respectively in 2009 and 2010 for HP.

∴In 2009,

$50 = \frac{2x - E_1}{E_1} \times 100$

$\Rightarrow 1.5\ E_1 = 2x$

$\Rightarrow E_1 = \frac{2x}{1.5}\ Lakh$

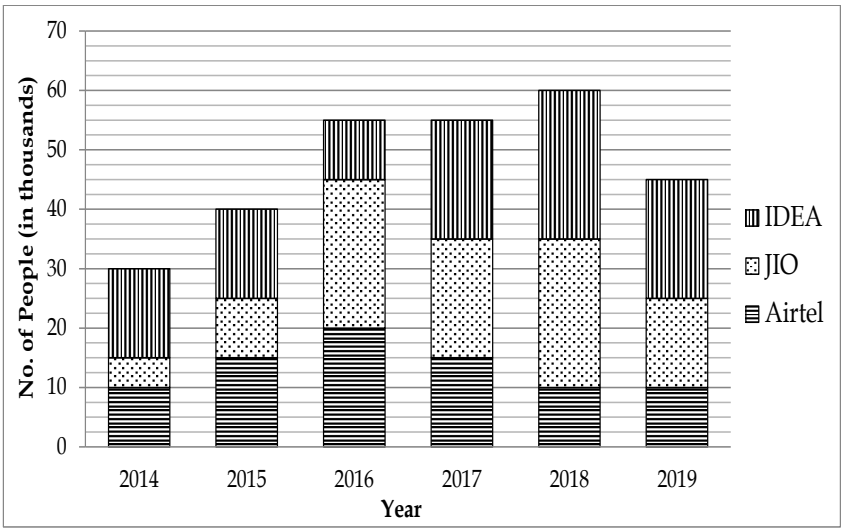
In 2010,

$45 = \frac{3x - E_2}{E_2} \times 100$

$\Rightarrow E_2 = \frac{3x}{1.45}$

$\therefore \frac{2x}{1.5} : \frac{3x}{1.45} = 29 : 45.$

Directions (36-40): Study the given graph carefully to answer the questions that follow:



Q36. What is the average number of people using mobile service of JIO for all the years together?

(a) $16\frac{2}{3}$ (b) $14444\frac{1}{6}$ (c) $16666\frac{2}{3}$

(d) $14\frac{1}{6}$ (e) None of these

Q37. The total number of people using all the three mobile services in the year 2017 is what per cent of the total number of people using all the three mobile services in the year 2018?(rounded off to two digits after decimal)

(a) 89.72 (b) 93.46 (c) 88.18

(d) 91.67 (e) None of these

Q38. The number of people using mobile service of Idea in the year 2016 forms approximately what per cent of the total number of people using all the three mobile services in that year?

(a) 18 (b) 26 (c) 11

(d) 23 (e) 29

Q39. What is the ratio of the number of people using mobile service of AIRTEL in the year 2015 to that of those using the same service in the year 2014?

(a) 8 : 7 (b) 3 : 2 (c) 19 : 13

(d) 15 : 11 (e) None of these

Q40. What is the total number of people using mobile service ofJIO in the years 2018 and 2019 together?

(a) 35,000 (b) 30,000 (c) 45,000
(d) 25,000 (e) None of these

S36. Ans.(c)

Sol. Average $= \frac{1}{6} \times [5 + 10 + 25 + 20 + 25 + 15] \times 1000$

$= \frac{100000}{6} = 16666\frac{2}{3}$

S37. Ans.(d)

Sol. Required % $= \frac{55}{60} \times 100 = 91.67\%$

S38. Ans.(a)

Sol. Required % $= \frac{10}{55} \times 100 = 18\%$ (approx.)

S39. Ans.(b)

Sol. Required Ratio = 15 : 10 = 3 : 2

S40. Ans.(e)

Sol. Required no. of people = (25 + 15) × 1000 = 40000

Directions(41-45): Study the given information carefully to answer the questions that follow:

An organization consists of 2400 employees working in different departments, viz HR, Marketing, IT, Production and Accounts. The ration of male to female employees in the organization is 5 : 3. Twelve percent of the males work in the HR department. Twenty four percent of the females work in the Accounts department. The ratio of males to females working in the HR department is 6:11. One-ninth of the females work in the IT department. Forty two percent of the males work in the Production department. The number of females working in the production department is 10 percent of the males working in the same. The remaining females work in the marketing department. The total number of employees working in the IT department is 285. Twenty two percent of the males work in the Marketing and the remaining work in the Accounts department.

Q41. The number of males working in the IT department forms approximately what percent of the total number of males in the organization?

(a) 5 (b) 12 (c) 21
(d) 4 (e) 18

Q42. What is the difference between males in Accounts department and Males in IT department?

(a) 10 (b) 15 (c) 18
(d) 16 (e) None of these

Q43. The total number of employees working in the Accounts department forms what percent of the total number of employees in the organization?

(a) 19.34 (b) 16.29 (c) 11.47
(d) 23.15 (e) None of these

Q44. The number of females working in the Production department forms what percent of the total number of females in the organization?

(a) 7 (b) 2 (c) 4
(d) 15 (e) None of these

Q45. What is the total number of females working in the HR and Marketing departments together?

(a) 363 (b) 433 (c) 545
(d) 521 (e) None of these

Solutions (41–45):

Total no. of employees = 2400

No. of males = $\frac{5}{8} \times 2400 = 1500$

& No. of females = 900

Males (HR) = 12% of 1500 = 180

Females (HR) = $\frac{11}{6} \times 180 = 330$

∴ Females (Accounts) = 24% of 900 = 216

&Females (IT) = $\frac{1}{9} \times 900 = 100$

No. of Males in IT = 285 – 100 = 185

∴ No. of males in Production = 42% of 1500
= 630

Females (Production) = 10% of 630 = 63

Males (Marketing) = $\frac{22 \times 1500}{100} = 330$

No. of females in Marketing = (900 – 330 – 216 – 100 – 63)
= 191

No. of Male in Accounts = 1500 – 180 – 185 – 630 – 330
= 175

S41. Ans.(b)

Sol. Desired% = $\frac{185}{1500} \times 100 = 12.33\% \approx 12\%$

S42. Ans.(a)

Sol. No. of males in accounts = 175

No. of males in IT = 185

Difference = 10

S43. Ans.(b)

Sol. Reqd. % = $\frac{(216+175)}{2400} \times 100 = 16.29\%$

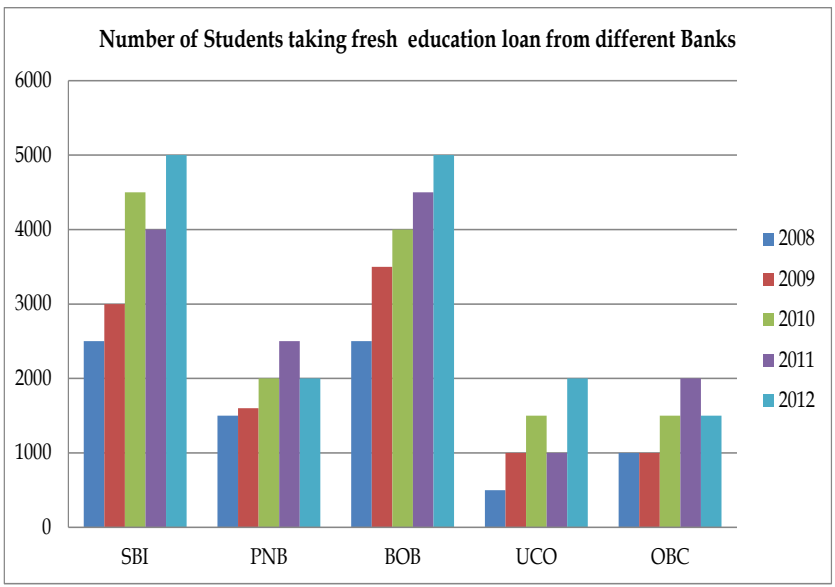
S44. Ans.(a)

Required %= $\frac{63}{900} \times 100 = 7\%$

S45. Ans.(d)

Sol. Females in (HR + Marketing) = 330 + 191 = 521

Directions (46-50): Read the given bar graph and answer the following questions.



Q46. Approximately how many students taking a loan from UCO in 2009 and PNB in 2010 were defaulters if 23% from UCO in 2009 and 20% from PNB in 2010 have defaulted?

(a) 630 (b) 650 (c) 600

(d) 750 (e) 840

Q47. In 2007, no of defaulters in SBI was 5%. However each year no of defaulters increases by 10% in number. What will be the difference between the number of defaulters of SBI in the year 2009 and 2012?

(a) 1500 (b) 2000 (c) 1325

(d) 1456 (e) Cannot be determined

Q48. In which of the following years, the difference in no. of students taking loan from Bank BOB from the previous year is highest?

(a) 2008 (b) 2009 (c) 2010
(d)2012 (e) None of these

Q49. If on average, Rs. 175000 per students education loan sanctioned by OBC bank all over the year. What will be total amount sanctioned by OBC in all given years?

(a) 1055600000 (b) 1055800000 (c) 1620000000
(d) 1050000000 (e) None of the above

Q50. What is the ratio of Number of students taking Education Loans from SBI and BOB together in all the years and the total no of students taking Education loans in 2010 and 2011 together?

(a) 8 : 5 (b) 5 : 7 (c) 7 : 5
(d) 9 : 7 (e) None of these

S46. Ans.(a)

Sol.

Students taking loan from UCO in 2009 = 1000
Defaulters (UCO) = 23% of 1000 = 230
Person taking loan from PNB in 2010 = 2000
Defaulters (PNB) = 20% of 2000 = 400
Total desired defaulters = 230 + 400 = 630

S47. Ans.(e)

Sol. Cannot be determined because no. of students taking a loan from SBI in 2007 is unknown.

S48. Ans.(b)

Sol. From graph, it is clear that in 2009, difference between no. of students taking a loan is highest as compared to previous year.

S49. Ans.(e)

Sol. No. of students taking education loan from OBC bank all over the year
= 1000 + 1000 + 1500 + 2000 + 1500= 7000
Total loan amount sanctioned over the years = 7000 × 1,75,000
= Rs. 1,22,50,00,000

S50. Ans.(c)

Sol.

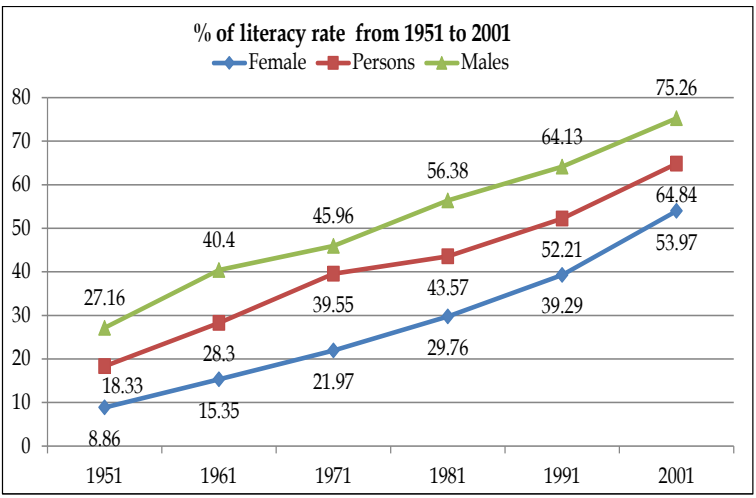
SBI : 2500 + 3000 + 4500 + 4000 + 5000 = 19000
BOB : 2500 + 3500 + 4000 + 4500 + 5000 = 19500

Total no. of students taking loan in 2010 = 13500

Total no. of students taking loan in 2011 = 14000

Desired ratio = $\frac{19000+19500}{13500+14000} = \frac{38500}{27500} = \frac{7}{5}$

Directions (51-55): Study the following line graph carefully and answer the questions given below.



Q51.What is the approx difference between the percentage literacy rate increased in male from 1951 to 1991 and percentage literacy rate increased in female from 1971 to 2001.

(a) 15% (b) 10% (c) 5%

(d) 20% (e) 2%

Q52.In which of the census years percentage increase given in male literacy rate was the highest with respect to previous census year?

(a) 1981 (b) 1991 (c) 2001

(d) 1961 (e) None of these

Q53.In which of the given census years was the percentage increase in the literacy rate of females the lowest with respect to that of previous census year?

(a) 1981 (b) 1991 (c) 2001

(d) Data inadequate (e) None of these

Q54.In which of the given census years was the percentage increase in the number of males the highest with respect to the previous census year?

(a) 1981 (b) 1991 (c) 2001

(d) Data inadequate (e) None of these

Q55.What is the ratio of percentage literacy rate increased of male from (1961-1981) to literacy rate increased of person in 1971?

(a) 1 : 1 (b) 1 : 2 (c) 2 : 1
(d) 1 : 3 (e) 3 : 1

S51. Ans.(b)
Sol.

Required difference $= \left(\frac{53.97-21.97}{21.97}\right) \times 100 - \left(\frac{64.13-27.16}{27.16} \times 100\right)$

$= \left(\frac{32}{21.97} \times 100\right) - \frac{36.97}{27.16} \times 100$

$\approx 146 - 136$

$\approx 10\%$

S52. Ans.(d)
Sol.

Percentage increase in the literacy rate of male in
1961 = 48.74%
1971 = 13.76%
1981 = 22.67%
1991 = 13.74%
2001 = 17.35%
∴Required year = 1961

S53. Ans.(b)
Sol.

Percentage increase in the literacy rate of female
In 1961 = 73.25%
In 1971 = 43.12%
In 1981 = 35.45%
In 1991 = 32.02%
In 2001 = 37.36%

S54. Ans.(d)
Sol.

Since, the number of males are not specified, we can not get the required value.

S55. Ans.(a)
Sol.

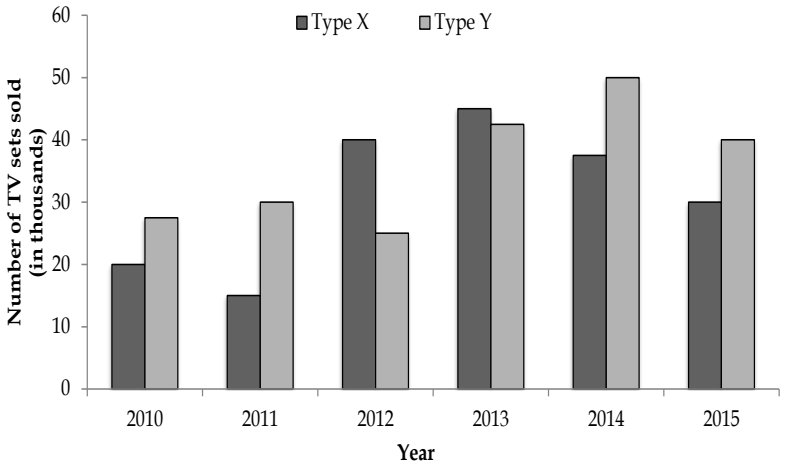
Required ratio $= \left(\frac{56.38-40.4}{40.4} \times 100\right) : 39.55$

$= 39.55 : 39.55$

$= 1 : 1$

Directions (56-60): Study the following graph carefully and answer the questions given below.

Number of TV sets sold over the years



Q56. What was the average number of Y-type TV sets sold by the company in 2011, 2012, 2014 and 2015 together?

(a) 32869 (b) 36250 (c) 35600
(d) 39827 (e) 42686

Q57. The number of X-type TV sets sold in 2011 was exactly what percent of the number of Y-type TV sets sold in 2015?

(a) $33\frac{1}{2}\%$ (b) $32\frac{1}{3}\%$ (c) $37\frac{1}{2}\%$
(d) $45\frac{1}{2}\%$ (e) $53\frac{1}{2}\%$

Q58. What is the percentage increase in the sale of Y-type TV sets from 2011 to 2014?

(a) 25% (b) $62\frac{2}{3}\%$ (c) $53\frac{1}{3}\%$
(d) $66\frac{2}{3}\%$ (e) 49%

Q59. In which of the following years was the percentage increase/decrease of sale of X-type TV sets the maximum from the previous year?

(a) 2014 (b) 2012 (c) 2015
(d) 2011 (e) 2010

Q60. In which of the following years was the difference between the sales of X-type TV sets and Y-type TV sets the maximum?

(a) 2010 and 2012 (b) 2013 and 2014 (c) 2011 and 2012
(d) 2014 and 2013 (e) 2012 and 2013

S56. Ans.(b)

Sol. Required average = $\frac{(30+25+50+40)}{4} \times 1000$

$= 36.25 \times 1000 = 36250$

S57. Ans.(c)

Sol. Required % = $\frac{15}{40} \times 100 = 37\frac{1}{2}\%$

S58. Ans.(d)

Sol. Required % increase = $\frac{50-30}{30} \times 100$

$= \frac{200}{3}\% = 66\frac{2}{3}\%$

S59. Ans.(b)

Sol. In year 2011 = $\frac{15-20}{20} \times 100$

$= -\frac{5}{20} \times 100 = -25\%$

In year 2012 = $\frac{40-15}{15} \times 100 = 166\frac{2}{3}\%$

In year 2013 = $\frac{45-40}{40} \times 100 = 12.5\%$

In year 2014 = $\frac{37.5-45}{45} \times 100 = -16.67\%$

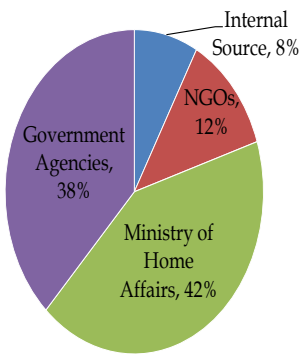
In year 2015 = $\frac{30-37.5}{37.5} \times 100 = -20\%$

S60. Ans.(c)

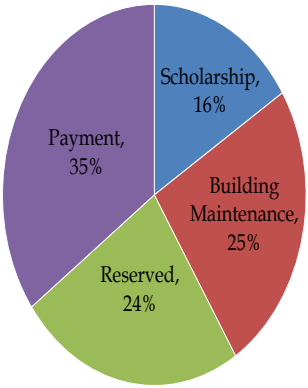
Sol. From the graph the maximum difference is in the year 2011 and 2012.

Directions (61-65): Study the following pie-charts carefully and answer the questions given below them.

The entire fund that an organization gets from different sources is equal to Rs. 16 crore.



Sources of funds in the organisation



Use of fund by the organisation

Q61. What is the difference between the fund acquired by the organization from NGOs and that from Government Agencies?

(a) Rs. 43268000 (b) Rs. 38650000 (c) Rs. 46800000
(d) Rs. 52860000 (e) None of the above

Q62. If the organization managed Building Maintenance from the Ministry of Home Affairs fund only, how much fund from the Ministry of Home Affairs would still be left for other use?

(a) Rs. 2.72 crore (b) Rs. 7.23 crore (c) Rs. 5.20 crore
(d) Rs. 3.06 crore (e) Rs. 8.03 crore

Q63. If the Scholarship has to be paid out of the fund from Government Agencies, find what is the approximate percentage of Government Agencies fund used for this purpose.

(a) 42.11% (b) 38.6% (c) 31.23%
(d) 48.3% (e) 52%

Q64. What is the total amount used by the organization for Payment?

(a) Rs. 4.8 crore (b) Rs. 6.3 crore (c) Rs. 5.6 crore
(d) Rs. 9.73 crore (e) None of the above

Q65. What is the amount of fund acquired by the organization from Ministry of Home Affairs?

(a) 6.25 crores (b) 6.2 crores (c) 6.72 crores
(d) 9.25 crores (e) None of the above

S61. Ans.(e)

Sol. Required fund = (38 – 12)% of 160000000
= Rs. 41600000

S62. Ans.(a)

Sol. Required remaining amount

= 42% of 16 cr – 25% of 16 cr

= 17% of 16 cr

= 2.72 crore

S63. Ans.(a)

Sol. Required % = $\frac{16}{38} \times 100 = 42.11\%$

S64. Ans.(c)

Sol. Required amount = 35% of 16 crore

= $\frac{35 \times 16}{100}$ = Rs. 5.6 crore

S65. Ans.(c)

Sol. Fund acquired = 42% of 16 crore

= $\frac{42 \times 16}{100}$ = Rs. 6.72 crore

Directions (66-70): Study the following table carefully and answer the questions given below:

Number of Cars (in thousands) of different Models and colours sold in two Metro Cities in a year

Type	Metro M					Metro H				
	Colour					Colour				
	Black	Red	Blue	White	Silver	Black	Red	Blue	White	Silver
A	40	25	55	75	15	45	32	40	60	20
B	20	35	60	80	20	30	37	39	81	35
C	35	30	50	90	35	40	42	41	6	37
D	45	40	45	85	40	35	39	37	90	42
E	50	35	35	60	30	50	44	43	77	22
F	55	42	40	65	52	47	34	45	87	17

Q66.The difference between the white-coloured cars sold in the two metros of which of the following models is the minimum?

(a) A (b) C (c) D

(d) F (e) None of these

Q67. The total number of blue-coloured cars of Model E and D sold in metro H is exactly equal to the number of white-coloured cars of which model in Metro M?

(a) B (b) F (c) C

(d) A (e) None of these

Q68. What is the difference between the number of blue-colours cars of model 'C' sold in Metro M and number of red-colour cars of Model 'F' sold in Metro H?

(a) 8,000 (b) 10,000 (c) 12,000
(d) 15,000 (e) None of these

Q69. The total number of silver-coloured cars sold in Metro H is approximately what percentage of that in Metro M?

(a) 130 (b) 140 (c) 90
(d) 100 (e) 110

Q70. In metro M the number of cars sold was maximum for which of thecolour-model combinations?

(a) White-C (b) Blue-B (c) Silver-B
(d) White-D (e) Silver-F

S66. Ans.(e)
Sol.
A ⇒ 75 – 60 = 15 B ⇒ 81 – 80 = 1 C ⇒ 90 – 6 = 84
D ⇒ 90 – 85 = 5 E ⇒ 77 – 60 = 17 F ⇒ 87 – 65 = 22
Required model = B

S67. Ans.(a)
Sol. Blue coloured car of
Model E and D sold in Metro H = 43 + 37 = 80,000
Which is equal to white coloured car of B model in metro M

S68. Ans.(e)
Sol. Required difference = 50 – 34 = 16000

S69. Ans.(c)
Sol. Required % = $\frac{173}{192} \times 100 \approx 90\%$.

S70. Ans.(a)
Sol.
White C – 90
Blue B – 60
Silver B – 20
White D – 85
Silver F – 52

Direction (71–75): Study the following table carefully to answer the questions that follow:

Number of Orders cancelled by five different e-commerce companies in six different years

e-Com / Years	P	Q	R	S	T
2011	240	405	305	365	640
2012	420	600	470	446	258
2013	600	680	546	430	610
2014	160	208	708	550	586
2015	140	640	656	250	654
2016	290	363	880	195	483

Q71. What was the difference between the highest number of Order cancelled by Company-Q and the lowest number of Order cancelled by Company-T out of all the six years?

(a) 325 (b) 422 (c) 596
(d) 416 (e) None of these

Q72.What was the approximate percentage increase in number of Order cancelled by Company-S in the year 2014 as compared to previous year?

(a) 57 (b) 44 (c) 125
(d) 28 (e) 95

Q73. What was the average number of Order cancelled by the Companies P,R, S and T in the year 2014?

(a) 405 (b) 551.5 (c) 501
(d) 488 (e) None of these

Q74.In 2016, 40% Order are cancelled by Company-R due to bad weather and others by packaging fault. How many orders are cancelled by Company-R due to packaging fault?

(a) 548 (b) 468 (c) 568
(d) 528 (e) None of these

Q75.What is the approximate percentage of cancelled Order by Companies P and R in 2013 as compared to cancelled orders by Company-S in 2011?

(a) 340 (b) 314 (c) 280
(d) 265 (e) 384

S71. Ans.(b)

Sol. Highest number of Order cancelled by Company-Q = 680
Lowest number of Order cancelled by Company-T = 258
Required difference = 680 – 258 = 422

S72. Ans.(d)

Sol. Number of Order cancelled by Company-S in the year 2013 = 430

Number of Order cancelled by Company-S in the year 2014 = 550

Required percentage = $\frac{550-430}{430} \times 100 = 28$ (approx)

S73. Ans.(c)

Sol. Required average = (160 + 708 + 550 + 586) ÷ 4

= 2004 ÷ 4 = 501

S74.Ans.(d)

Sol. Total number of Order are cancelled by Company R in 2016 = 880

Order are cancelled by Company-R due to packaging fault = 60%

Required number = 60% of 880

= 528

S75.Ans.(b)

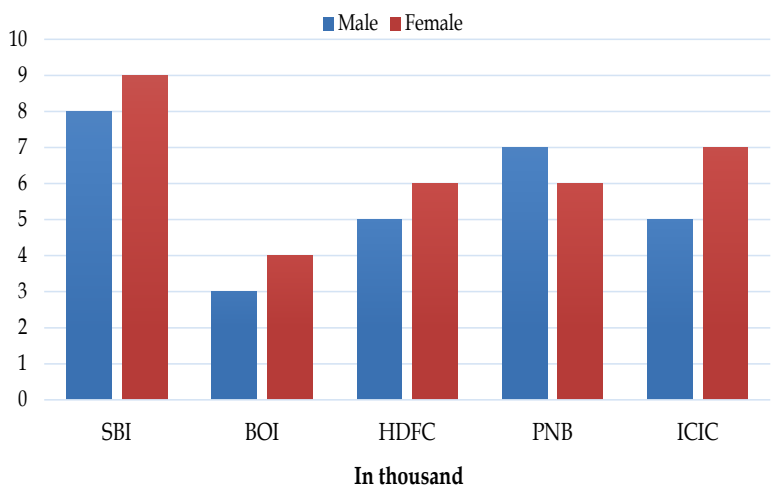
Sol. Cancelled Order by Company's P and R in 2013 = 600 + 546 = 1146

Cancelled Order by Company-S in 2011 = 365

Required percentage = $\frac{600+546}{365} \times 100 = 314$(approx.)

Directions (76-80): Study the bar graph carefully and answer the following questions.

The number of male and female probationary officers in various banks



Q76.What is the total number of employees in the given six banks?

(a) 60000 (b) 56000 (c) 58000
(d) 62000 (e) 59000

Q77.What is the ratio of male to female probationary officers in all six banks?

(a) 5 : 4 (b) 3 : 2 (c) 2 : 3
(d) 7 : 8 (e) 4 : 5

Q78.In HDFC 40% males and 30% females are unmarried, then what is the ratio of the married males to the married females in HDFC?

(a) 7 : 5 (b) 5 : 7 (c) 12 : 13
(d) 2 : 3 (e) 3 : 5

Q79.If the number of married male probaionary officers in ICICI is euqal to that in PNB, which is 40% of the male probabtionary officers in PNB, then what is the percentage of married male probationary officers in ICIC with respect to the total number of probationary officers in ICIC?

(a) 25.51% (b) 28% (c) 27.91%
(d) 22% (e) 23.33%

Q80.The male probationary officers in PNB is what per cent more than the female probationary officers in BOI?

(a) 74.8% (b) 74% (c) 75%
(d) 75.4% (e) 78%

S76. Ans.(a)

Sol. Total employees of the given six banks

= (8 + 9 + 3 + 4 + 6 + 5 + 6 + 7 + 5 + 7) × 1000 = 60000

S77. Ans.(d)

Sol. Ratio of male to female probationary officers in all six banks

= (8000 + 3000 + 5000 + 7000 + 5000) : (9000 + 4000 + 6000 + 6000 + 7000)

= 28000 : 32000 = 7 : 8

S78.Ans (b)

Sol. Unmarried males in HDFC = $5000 \times \frac{40}{100} = 2000$

∴ Married males = (5000 – 2000) = 3000

Unmarried females in HDFC = $6000 \times \frac{30}{100} = 1800$

∴ Married females = (6000 – 1800) = 4200

∴ Required ratio = 3000 : 4200 = 5 : 7

S79. Ans.(e)

Sol. Number of male married probationary officers in ICICI

= Number of male married probationary officers in PNB

= Male probationary officers in PNB $\times \frac{40}{100} = 7000 \times \frac{40}{100} = 2800$

∴The percentage of married male probationary officers in ICICI w.r.t to the total probationary officers in ICICI

$= \frac{2800 \times 100}{7000 + 5000} = 23.33\%$

S80. Ans.(c)

Sol. Required% $= \frac{7000 - 4000}{4000} \times 100\%$

= 75% more than female probationary officers in BOI

Directions (81-85): The table given below shows the monthly salary of six employees working in a leading manufacturing firm.

Years→ Employees↓	2011	2012	2013	2014	2015	2016
Richali	19200	20500	23400	25000	26600	28200
Piyush	28500	30100	31800	33000	34900	36000
Ritesh	22600	24000	26400	28100	29800	31000
Aditi	23000	24500	26100	27000	29300	31200
Krishna	24800	26000	27900	29100	30800	33000
Raksha	31500	35800	36600	40200	44000	45800

Q81. What is the difference between average monthly income of Aditi all over the years and monthly income of Raksha in 2015?

(a) Rs. 17250 (b) Rs. 18150 (c) Rs. 17510

(d) Rs. 17150 (e) None of these

Q82. Monthly salary of Ritesh in 2016 contributes for what percent in total monthly salary of Richali, Piyush and Krishna together in 2016? (approximately)

(a) 30% (b) 32% (c) 38%

(d) 42% (e) 28%

Q83. Find the ratio of annual salary of Aditi in 2012 and Raksha in 2014 together to that of Piyush in 2013 and Richali in 2011 together?

(a) 6 :7 (b) 7 : 6 (c) 5 : 4

(d) 3 : 2 (e) None of these

Q84. Monthly salary of Piyush and Krishna together in 2013 is by what percent more or less than that of Aditi and Raksha together in 2015? (approximately)

(a) 19% more (b) 16% less (c) 19% less
(d) 16% more (e) 29% less

Q85. In 2015, Raksha donated 5% of her monthly salary, she then lent out 20% of remaining salary on CI at 5% for 3 years. Find the interest (approx.) earned by her after 3 years?

(a) Rs. 1381 (b) Rs. 1318 (c) Rs. 1418
(d) Rs. 1315 (e) Rs. 1300

S81. Ans.(d)

Sol. Average monthly income of Aditi = $\frac{1}{6} \times 161100 = 26850$ Rs.

∴Required difference = 44000 – 26850 = Rs. 17150

S82. Ans.(b)

Sol. Required percentage = $\frac{31000}{97200} \times 100 \approx 32\%$

S83. Ans.(e)

Sol. Required ratio = $\frac{(24500+40200)\times 12}{(31800+19200)\times 12} = \frac{647}{510}$

S84. Ans.(c)

Sol. Monthly salary of Piyush and Krishan = 31800 + 27900 = 59700

Monthly salary of Adity and Raksha = 29300 + 44000 = 73300

∴Required percentage = $\frac{13600}{73300} \times 100 \approx 19\%$ less.

S85. Ans.(b)

Sol. 20% of amount left after donation = $\frac{1}{5} \times \frac{95}{100} \times 44000$

= Rs. 8360

∴ C.I. after 3 years = $8360\left[\left(1+\frac{5}{100}\right)^3 - 1\right]$

= 8360 × 0.1576

≈ Rs. 1318

Directions (86-90): A team of 5 players participated in a tournament and played four matches (1 to 4). The following table gives partial information about their individual scores and the total runs scored by the team in each match.

Each column has two values missing. These are the runs scored by the two lowest scorers in that match. None of the two missing values is more than 10% of the total runs scored in that match.

		Match-1	Match-2	Match-3	Match-4
Runs scored by player	Ajinkya		100		53
	Pandya	88	65		52
	Cheteswar			100	
	Dhawan	72	75	20	56
	Virat	60		78	
Total		270	300	240	200

Q86. What is the maximum possible percentage contribution of Ajinkya in the total runs scored in the four matches (approximately)?

(a) 20% (b) 22% (c) 17%

(d) 23% (e) Cannot be determined

Q87.What is the maximum possible percentage contribution of Viratin the total runsscored in the four matches?

(a) 18% (b) 19.9% (c) 18.6%

(d) 20.2% (e) Cannot be determined

Q88. If the absolute difference between the total runs scored by Ajinkya and Cheteshwar in the Four matches is minimum possible then what is the ratio of Ajinkya and Cheteshwar's total runs scored by them in the four matches.

(a) 187:189 (b) 189:187 (c) 183:187

(d) 189:188 (e) Cannot be determined

Q89.If the absolute difference between the total runs scored by Ajinkya and Cheteshwar in the four matches is minimum possible then what is the absolute difference between total runs scored by Pandya and Virat in the four matches?

(a) 32 (b) 37 (c)35

(d) 27 (e) Cannot be determined

Q90. The players are ranked 1 to 5 on the basis of the total runs scored by them in the four matches, with the highest scorer getting Rank 1. If it is known that no two players scored the same number of total runs, how many players are there whose ranks can be exactly determined?

(a) 0 (b) 1 (c) 3

(d) 5 (e) Cannot be determined

S86. Ans. (a)

Sol.

Maximum possible runs scored by Ajinkya in Match-1 = 27

Maximum possible runs scored by Ajinkya in Match-3 = 19 (less than 20)

Maximum possible percentage contribution:

$$\frac{27+100+19+53}{270+300+240+200}\times 100\% = \frac{199}{1010}\times 100\% = 19.7\%$$

= 20% approx.

S87. Ans. (c)

Sol.

Maximum possible runs scored by Virat in Match-2 = 30

Maximum possible runs scored by Virat in Match-4 = 20

Maximum possible percentage contribution:

$$\frac{60+30+78+20}{270+300+240+200}\times 100\%$$

$$= \frac{188}{1010}\times 100\% = 18.6\%$$

S88. Ans. (b)

Sol.

Maximum possible total runs scored by Cheteshwar in the four matches = 27 + 30 + 110 + 20 = 187.

Total runs scored by Ajinkya in the four matches is in the range of 189 to 199

Hence,

In such a case minimum possible

Total runs scored by Ajinkya in the four matches = 23 + 100 + 13 + 53 = 89

Difference = 189 – 187 = 2 (minimum possible)

So Required ratio is 189: 187

S89. Ans. (b)

Sol.

Maximum possible total runs scored by Cheteshwar in the four matches= 27 + 30 + 110 + 20 = 187.

In such a case minimum possible total runs scored by Ajinkya in the four matches

= 23 + 100 + 13 + 53 = 189.

Difference = 189 – 187 = 2 (minimum possible)

Subsequently total runs scored by Pandya in the four matches = 88 + 65 + 19 + 52 = 224.

Also, total runs scored by Virat in the four matches

= 60 + 30 + 78 + 19 = 187

Absolute difference = 224 – 187 = 37

S90. Ans.(c)
Sol.
Individual ranges for total score:
Ajinkya-> 189-199
Pandya-> 218-224
Cheteshwar-> 182-187
Dhawan-> 223
Virat-> 187-188
Least total will be of Cheteshwar (Rank 5)
2nd least will be Virat (Rank 4)
Rank 3 must be of Ajinkya
It is not possible to determine the exact ranks of Pandya and Dhawan

Directions (91-95): The table below shows production of five types of Trucks by a company in the years 2009 to 2014. Study the table and answer questions.

Production of trucks by a company

Year → Type ↓	2009	2010	2011	2012	2013	2014	Total
Minivan	8	20	16	17	21	6	88
Pickup	16	10	14	12	12	14	18
Canopy	21	17	16	15	13	8	90
Panel	4	6	10	16	20	31	87
Cab	25	18	19	30	14	27	133
Total	74	71	75	90	80	86	476

Q91. In which year the production of trucks of all types taken together was approximately equal to the average of the total production during the period?
(a) 2009 (b) 2011 (c) 2013
(d) 2014 (e) None of these

Q92. In which year, the total production of trucks of types of Minivan and Pickup together was equal to the total production of trucks of types Canopy and Panel together.
(a) 2010 (b) 2011 (c) 2014
(d) 2013 (e) None of these

Q93. During the period 2009-14, in which type of trucks was a continuous increase in production?
(a) Minivan (b) Pickup (c) Canopy
(d) Panel (e) None of these

Q94. The production of which type of trucks was 25% of the total production of all types of trucks during 2013?

(a)Panel (b) Canopy (c) Pickup
(d)Minivan (e) None of these

Q95. The per cent increase in total production of all types of trucks in 2012 to that in 2011 was?

(a) 15 (b) 20 (c) 25
(d) 30 (e) None of these

S91. Ans.(c)

Sol. Average of the total production during the period $= \frac{476}{6} \approx 80$ which is equal to the total production in 2013.

S92. Ans.(d)

Sol. Answer will be 2013.

S93. Ans.(d)

Sol. Answer is Panel

S94. Ans.(a)

Sol. 25% of 80 = 20 = production of Panel's car in 2013.

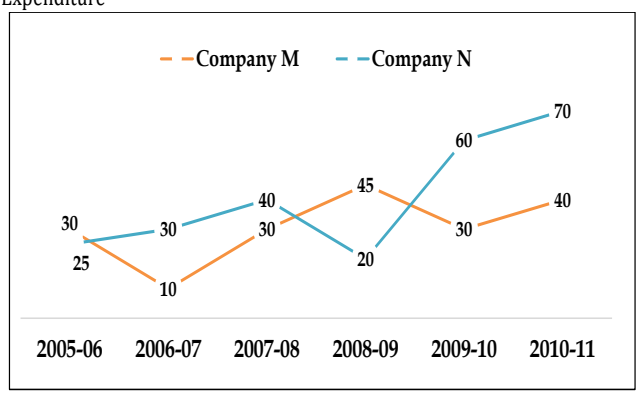
S95. Ans.(b)

Sol. Required percent increase $= \frac{90-75}{75} \times 100 = 20\%$

Directions (96-100): Study the following graph to answer the given questions.

Percent profit earned by two companies over the given years

$$\% \text{ profit} = \frac{\text{Income} - \text{Expenditure}}{\text{Expenditure}} \times 100$$



Q96. For Company M, its income in 2009-10 was equal to its expenditure in 2010-11, what was the ratio of its respective incomes in these two years?

(a) 4:5 (b) 3:4 (c) 5:7
(d) Cannot be determined (e) None of these

Q97. If the income of Company M in 2006-07was equal to the expenditure of Company N in 2009-10 what was the ratio of their respective profits?

(a) 13:15 (b) 15:26 (c) 13:26
(d) Cannot be determined (e) None of these

Q98. What was the difference in the expenditures of the two companies in 2007-08?

(a) 10 (b) 100 (c) 1000
(d) Cannot be determined (e) None of these

Q99. In 2010-11 the income of Company N was Rs. 119 crores. What was its expenditure in that year?

(a) Rs. 76.8 crore (b) Rs. 64 crore (c) Rs. 70 crore
(d) Cannot be determined (e) None of these

Q100. For Company N, in which year is the percent of increase in percent profit over that of previous year the highest?

(a) 2011-12 (b) 2007-08 (c) 2010-11
(d) Cannot be determined (e) None of these

S96. Ans.(c)

Sol.

$I_{M\ 2009-10} = E_{M\ 2010-11} = \frac{I_{M\ 2010-11}}{1.4}$

$I_{M\ 2009-10} : I_{M\ 2010-11} = \frac{10}{14} = 5 : 7.$

S97. Ans.(e)

Sol. Suppose in the year 2006-07 expenditure of Company M = Rs. a

Then profit earned by Company M in this year = Rs. (10% of a)

Hence, income of Company M = Rs. (110% of a)

Again, expenditure of Company N in 2009-10 = Rs. $\frac{a \times 110}{100}$

Hence, profit earned by Company N in 2009-10

$= Rs. \frac{a \times 110}{100} \times \frac{60}{100}$

Thus, required ratio

$= \frac{\frac{10}{100} \times a}{\frac{a \times 110}{100} \times \frac{60}{100}} = \frac{10}{66} = 5 : 33.$

S98. Ans.(d)

Sol. The given graph depicts only the percent profit earned by the two companies over the given years. Hence, these information are insufficient to answer the question.

S99. Ans.(c)

Sol. In 2010-11, profit earned by Company N was 70%

Therefore, 170% of expenditure Rs. 119 crore

Thus, required expenditure = $\frac{119}{170} \times 100$ = Rs. 70 Crores

S100. Ans.(e)

Sol. Percent of increase in percent profit over that of the previous year for the given years is as follows:

Year

2006-07: $\frac{(30-25)}{25} \times 100 = 20\%$

2007-08: $\frac{(40-30)}{30} \times 100 = 33.33\%$

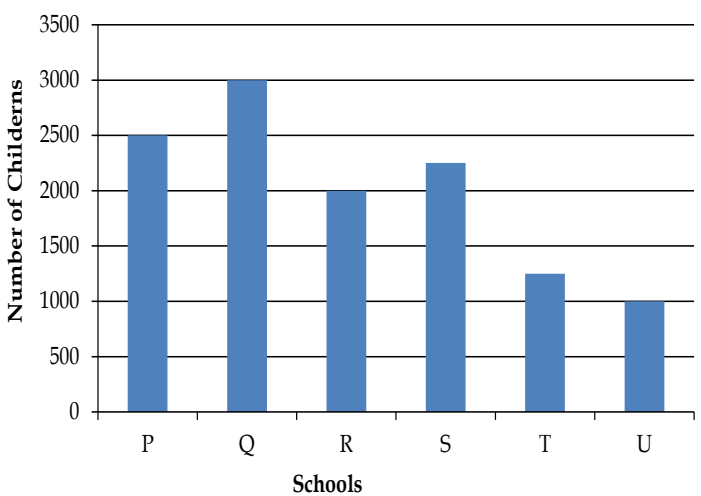
2008-09: $= \frac{(20-40)}{40} \times 100 = -50\%$

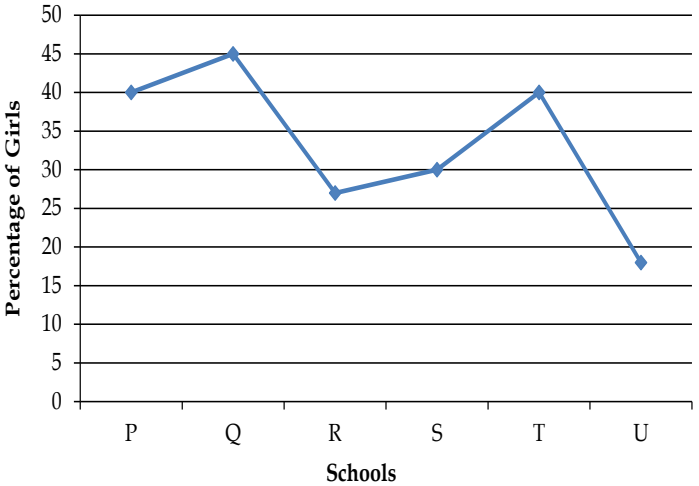
2009-10: $\frac{(60-20)}{20} \times 100 = 200\%$

2010-11: $\frac{(70-60)}{60} \times 100 = 16.66\%$

Directions (101-105): Study the graphs carefully to answer the questions that follow.

Total number of children in 6 different schools and the percentage of girls in them





Q101. What is the total percentage of boys in schools R and U together? (rounded off to two digits after decimal)
(a) 78.55 (b) 72.45 (c) 76.28
(d) 75.83 (e) None of these

Q102. What is the total number of boys in school T?
(a) 500 (b) 600 (c) 750
(d) 850 (e) None of these

Q103. The total number of students in school R, is approximately what per cent of the total number of students in school S?
(a) 89 (b) 75 (c) 78
(d) 82 (e) 94

Q104. What is the average number of boys in schools P and Q together?
(a) 1425 (b) 1575 (c) 1450
(d) 1625 (e) None of these

Q105. What is the respective ratio of the number of girls in schools P to the number of girls in school Q? (a) 27 : 20 (b) 17 : 21
(c) 20 : 27 (d) 21 : 17
(e) None of these

S101. Ans.(d)
Sol. Number of boys in school R and U together

$$= \frac{2000 \times 72.5}{100} + \frac{1000 \times 82.5}{100}$$

$= 1450 + 825 = 2275$

$\therefore$Required percentage $= \frac{2275}{3000} \times 100 = 75.83\%$

S102. Ans.(c)

Sol. Number of boys in school T = $\frac{1250 \times 60}{100} = 750$

S103. Ans.(a)

Sol. Total number of students in school R = 2000

Total number of students in school S = 2250

∴Required percentage = $\frac{2000}{2250} \times 100 \approx 89$

S104. Ans.(b)

Sol. Required average = $\frac{1}{2}\left(\frac{2500 \times 60}{100} + \frac{3000 \times 55}{100}\right)$

$= \frac{1}{2}(1500 + 1650) = \frac{1}{2} \times 3150 = 1575$

S105. Ans.(c)

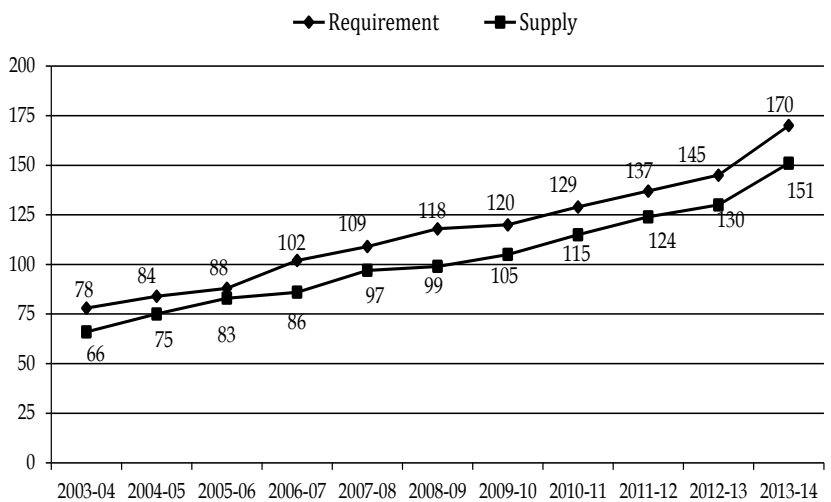
Sol. Required ratio = $\frac{2500 \times 40}{100} : \frac{3000 \times 45}{100}$

= 25 ×40 : 30 × 45

= 100 : 135 = 20 : 27

Directions (106-110): Study the graph and answer the following questions.

Power Supply Position in UP (in billion KWH)



Q106. What was the approximate percentage increase in supply of power between 2009-10 and 2013-14?

(a) 56% (b) 145% (c) 43%

(d) 85% (e) None of these

Q107. The cumulative shortfall between requirement and supply from 2009 to the end of 2014 was (in billion)

(a) 56 (b) 85 (c) 45
(d) 76 (e) None of these

Q108. The requirement of power in 2013-14 was approximately how many times the availability of supply in 2007-08?

(a) 2.6 (b) 1.75 (c) 2.75
(d) 2.0 (e) None of these

Q109. The percentage of growth in power requirement from 2008-09 to 2013-14 was less than the percentage of growth in power requirement from 2003-04 to 2008-09 by what figure?

(a) 3 (b) 4 (c) 15
(d) 7 (e) None of these

Q110. Between 2008-09 and 2012-13, the power generation has generally logged behind power demand by how many years?

(a) 1 (b) 2 (c) 3
(d) 4 (e) None of these

S106. Ans.(c)

Sol. In 2009-10 is 105 while in 2013-14 is 151.

So percentage increases is $\frac{151-105}{105} \times 100 = \frac{46}{105} \times 100 = 43\%$

S107. Ans.(d)

Sol. Total requirement = 120 + 129 + 137 + 145 + 170 = 701

Total supply = 105 + 115 + 124 + 130 + 151 = 625

Difference = 701 - 625 = 76

S108. Ans.(b)

Sol. 170 = 97 × x

So, $x = \frac{170}{97} = 1.75$

S109. Ans.(d)

Sol. In 2008-09 to 2013-14, % Growth = $\frac{170-118}{118} \times 100 \approx 44\%$

In 2003-04 to 2008-09 growth= $\frac{118-78}{78} = \frac{40}{78} \times 100 \approx 51\%$

So, more ≈ 51 - 44 = 7%

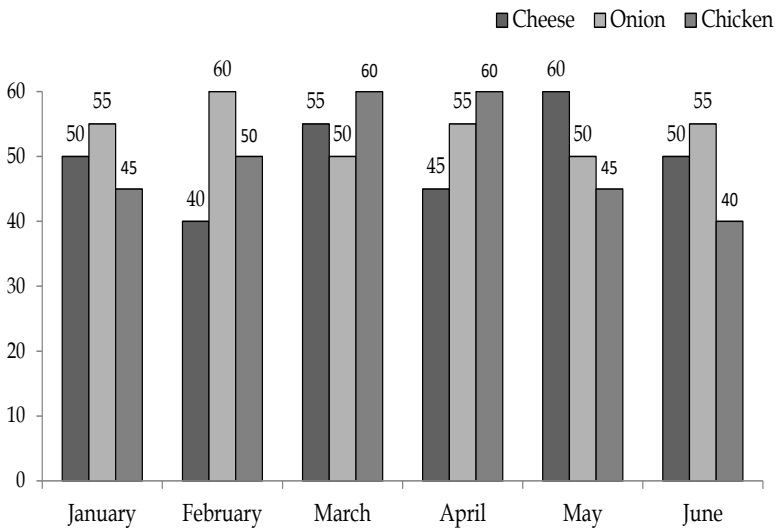
S110. Ans.(c)

Sol. In 2008-09 demand was 118 which completed in 2012-2013 means 3 years.

Directions (111-115): Dominos prepares Pizzas of three different types – Cheese, Onion and Chicken.

The production of the three types over a period of six Months has been expressed in the bar-graph provided below. Study the graph and answer the questions based on it.

Order of three different types of Dominos Pizzas over the Months (in lakh orders)



Q111. For which of the following Months the percentage of rise/fall in Order from the previous Month is the maximum for the Onion flavor?

(a) February (b) March (c) April
(d) May (e) June

Q112. For which type was the average annual Order maximum in the given period?

(a) Cheese only (b) Onion only (c) Chicken only
(d) Cheese and Onion (e) Cheese and Chicken

Q113. The total Order of Chicken type in March and April is what percentage of the total Order of Cheese type in January and February?

(a) 96.67% (b) 102.25% (c) 115.57%
(d) 120% (e) 133.33%

Q114. What is the difference between the average Order of Cheese type in January, February and March and the average Order of Onion type in April, May and June?

(a) 50,000 orders (b) 80,000 orders (c) 2,40,000 orders
(d) 3,30,000 orders (e) 5,00,000orders

Q115. What was the approximate decline in the Order of Chicken type in June as compared to the Order in April?

(a) 50% (b) 42% (c) 33%
(d) 25% (e) 22.5%

S111. Ans.(b)

Sol. The percentage rise/fall in Order from the previous Month for Onion type during various Months are:

In February = $\left[\frac{(60-55)}{55} \times 100\right]\% = 9.09\%$ (increase)

In March = $\left[\frac{(60-50)}{60} \times 100\right]\% = 16.67\%$ (decrease)

In April = $\left[\frac{(55-50)}{55} \times 100\right]\% = 10\%$ (increase)

In May = $\left[\frac{(55-50)}{55} \times 100\right]\% = 9.09\%$ (decrease)

In June = $\left[\frac{(55-50)}{50} \times 100\right]\% = 10\%$ (increase)

∴Maximum change is decrease of 16.67% during March.

S112. Ans.(b)

Sol. Average annual Orders over the given period for various types are:

For Cheese type = $\left[\frac{1}{6} \times (50 + 40 + 55 + 45 + 60 + 50)\right]$ lakh orders = 50 lakh orders.

For Onion type = $\left[\frac{1}{6} \times (55 + 60 + 50 + 55 + 50 + 55)\right]$ lakh orders

= 54.17 lakh orders.

For Chicken type = $\left[\frac{1}{6} \times (45 + 50 + 60 + 60 + 45 + 40)\right]$ lakh orders = 50 lakh orders.

∴ Maximum average Order is for Onion type.

S113. Ans.(e)

Sol. Required percentage = $\left[\frac{(60+60)}{(50+40)} \times 100\right]\% = \left(\frac{120}{90} \times 100\right)\% = 133.33\%$.

S114. Ans.(e)

Sol. Average Order of Cheese type in January, February and March = $\left[\frac{1}{3} \times (50 + 40 + 55)\right]$

= $\left(\frac{145}{3}\right)$ lakh orders.

Average Order of Onion type in April, May and June = $\left[\frac{1}{3} \times (55 + 50 + 55)\right]$

= $\left(\frac{160}{3}\right)$ lakh orders.

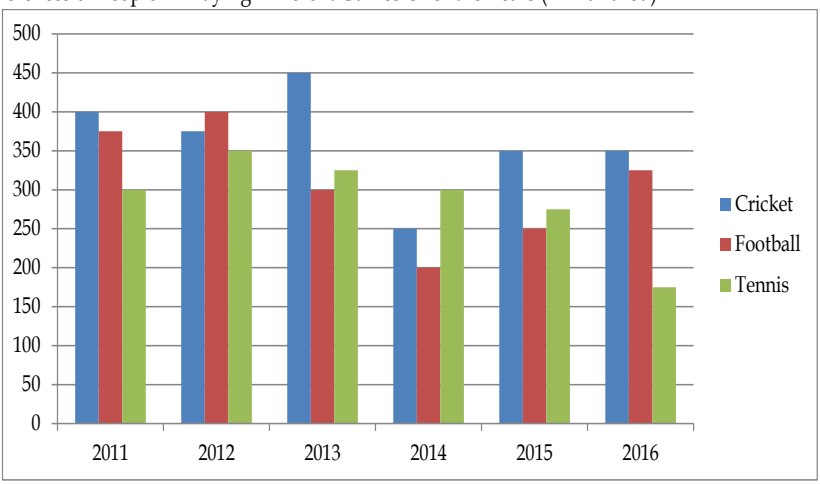
∴ Difference = $\left(\frac{160}{3} - \frac{145}{3}\right) = \frac{15}{3}$ = 5 lakh orders = 5,00,000 orders.

S115. Ans.(c)

Sol. Percentage decline in the Order of type Chicken in June as compared to the Order in April = $\left[\frac{(60-40)}{60} \times 100\right]\% = \left(\frac{20}{60} \times 100\right)\% = 33.33\% \approx 33\%$.

Directions (116-120): Study the following Graph carefully and answer the questions given below:

Preferences of People in Playing Different Games Over the Years (in Hundred)



Q116. In the year 2016, the people preferring to play Tennis is what percent of the people prefer to play Cricket, Football and Tennis together in that year?

(a) 22.76% (b) 20.58% (c) 42. 24%
(d) 25% (e) None of these

Q117. How many people have preferred to play Cricket in all the years together?

(a) 217500 (b) 224500 (c) 247500
(d) 175600 (e) None of these

Q118. What is the respective ratio of the number of people prefer to play cricket in 2011, 2013 and 2015 to the number of people prefer to play Tennis in the year 2013, 2015 and 2016?

(a) 2 : 1 (b) 45 : 33 (c) 44 : 31
(d) 48 : 31 (e) None of these

Q119. From 2011 to 2016, the total number of people who preferred to play Football was what percent more or less than the total number of people who preferred to play Tennis during same period?

(a) 5.24% (b) 6.24% (c) 7.24%
(d) 8.24% (e) 10%

Q120. The no. of people prefer to play tennis in 2016 is what percent fewer than the number of people preferring to play tennis in 2015?

(a) $23\frac{4}{11}\%$ (b) $36\frac{4}{11}\%$ (c) $42\frac{7}{13}\%$

(d) $33\frac{9}{13}\%$ (e) None of these

S116. Ans.(b)

Sol.

$$\text{Desired\%} = \frac{175}{350+325+175} \times 100 = \frac{175}{850} \times 100 = 20.58\%$$

S117. Ans.(a)

Sol. Total people playing cricket over all years = 2,17,500

S118. Ans.(d)

Sol.

$$\text{Ratio} = \frac{400+450+350}{325+275+175} = \frac{1200}{775} = 48:31$$

S119. Ans.(c)

Sol.

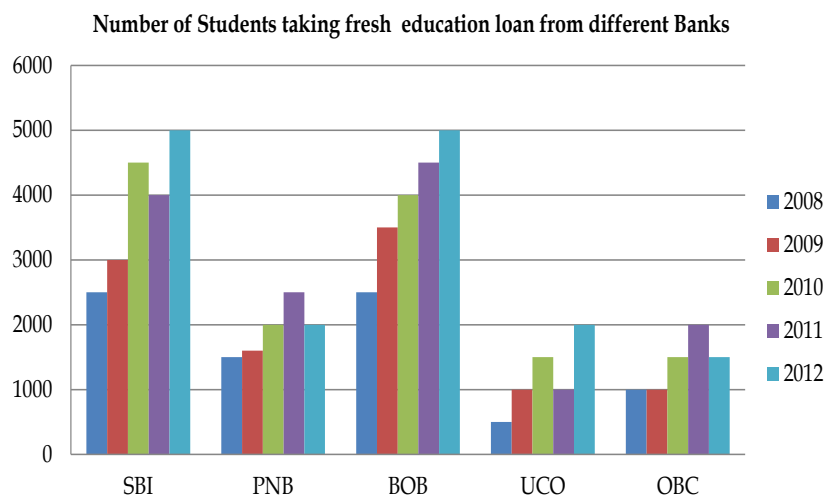
$$\text{Desired \%} = \frac{1850-1725}{1725} \times 100 = \frac{125}{1725} \times 100 = 7.24\%$$

S120. Ans.(b)

Sol.

$$\text{Desired \%} = \frac{275-175}{275} \times 100 = \frac{400}{11} = 36\frac{4}{11}\%$$

Directions (121–125): Read the given bar graph and answer the following questions.



Q121. Approximately how many students taking a loan from UCO in 2009 and PNB in 2010 were defaulters if 23% from UCO in 2009 and 20% from PNB in 2010 have defaulted?

(a) 630 (b) 650 (c) 600
(d) 750 (e) 840

Q122. In 2007, no of defaulters in SBI was 5%. However each year no of defaulters increases by 10% in number. What will be the difference between the number of defaulters of SBI in the Month 2009 and 2012?

(a) 1500 (b) 2000 (c) 1325
(d) 1456 (e) Cannot be determined

Q123. In which of the following years, the difference in no. of students taking loan from Bank BOB from the previous year is highest?

(a) 2008 (b) 2009 (c) 2010
(d) 2012 (e) None of these

Q124. If on average, Rs. 175000 per students education loan sanctioned by OBC bank all over the years. What will be total amount sanctioned by OBC in all given years?

(a) 1055600000 (b) 1055800000 (c) 1620000000
(d) 1050000000 (e) None of the above

Q125. What is the ratio of Number of students taking Education Loans from SBI and BOB together in all the Years and the total no of students taking Education loans in 2010 and 2011 together?

(a) 8 : 5 (b) 5 : 7 (c) 7 : 5
(d) 9 : 7 (e) None of these

S121. Ans.(a)

Sol.

Students taking loan from UCO in 2009 = 1000
Defaulters (UCO) = 23% of 1000 = 230
Person taking loan from PNB in 2010 = 2000
Defaulters (PNB) = 20% of 2000 = 400
Total desired defaulters = 230 + 400 = 630

S122. Ans.(e)

Sol. Cannot be determined because no. of students taking a loan from SBI in 2007 is unknown.

S123. Ans.(b)

Sol. From graph, it is clear that in 2009, difference between no. of students taking a loan is highest as compared to previous year.

S124. Ans.(e)

Sol. No. of students taking education loan from OBC bank all over the year

= 1000 + 1000 + 1500 + 2000 + 1500 = 7000

Total loan amount sanctioned over the years = 7000 × 1,75,000

= Rs. 1,22,50,00,000

S125. Ans.(c)

Sol.

SBI : 2500 + 3000 + 4500 + 4000 + 5000 = 19000

BOB : 2500 + 3500 + 4000 + 4500 + 5000 = 19500

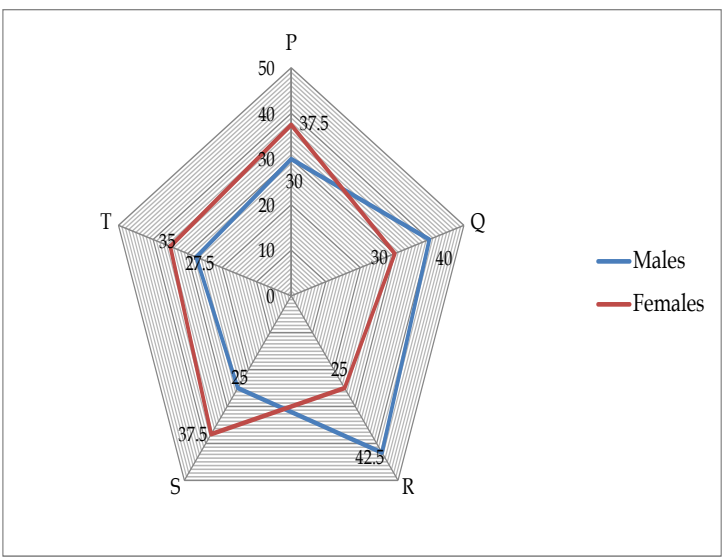
Total no. of students taking loan in 2010 = 13500

Total no. of students taking loan in 2011 = 14000

Desired ratio = $\frac{19000+19500}{13500+14000} = \frac{38500}{27500} = \frac{7}{5}$

Directions (126-130): Study the following Radar graph carefully and answer the questions given below.

Number of students studying in different universities in a year (Numbers in Lac).



Q126. What is the average number of females in all the universities together?

(a) 3300000 (b) 350000 (c) 320000
(d) 3200000 (e) None of these

Q127. What is the total number of students (males and females together) in University P and R together?

(a) 1300000 (b) 1350000 (c) 1400000
(d) 14500000 (e) None of these

Q128. What is the respective ratio of the number of females from University P and Q together to the number of males in the Universities R and T together?

(a) 27 : 32 (b) 27 : 28 (c) 25 : 28
(d) 28 : 27 (e) None of these

Q129. The number of males in University Q are what per cent of the total number of students (males and females together) in University S?

(a) 68 (b) 62 (c) 66
(d) 64 (e) None of these

Q130. If the total number of males in University T increases by 50%, what would be the total number of students (males and females together) in that university?

(a) 7526000 (b) 76250000 (c) 7625000
(d) 75260000 (e) None of these

S126.Ans.(a)

Sol.

Required No. $= \frac{37.5+30+25+37.5+35}{5} = \frac{165}{5}$ lakhs = 3300000

S127. Ans.(e)

Sol. Required No.(30 + 37.5 + 42.5 + 25)

=135 lakhs = 13500000

S128. Ans.(b)

Sol. Required Ratio = (37.5 + 30) : (42.5 + 27.5)

= 27 : 28

S129. Ans.(d)

Sol. Required % $= \frac{40}{25 + 37.5} \times 100$

= 64%

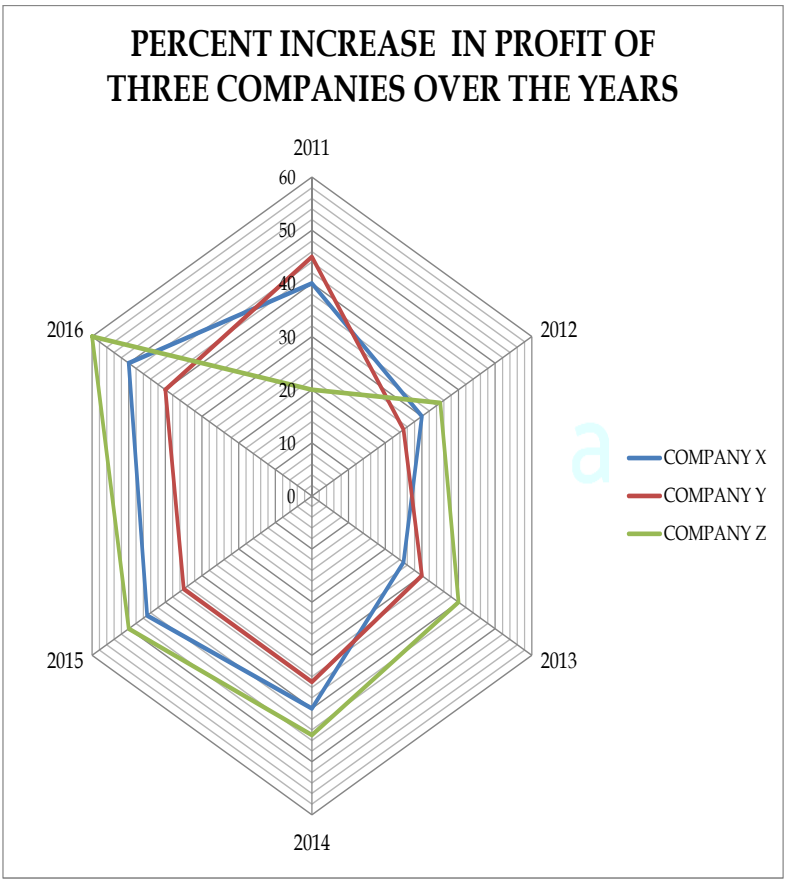
S130. Ans.(c)

Sol. Required no. = $\left(27.5 \times \frac{150}{100}\right) + 35$

= 76.25 lakhs

= 7,62,5000

Directions (131-135): Study the graph carefully to answer the questions that follow.



Q131. If profit for company Y in 2012 is 2000 and expenditure in 2013 for company Y is 50,000, then what is the total revenue in 2013 for Y? Give that total revenue = expenditure + profit.

(a) 52600 (b) 54200 (c) 53280

(d) 55800 (e) None of these

Q132. If profit in year 2015 for company Z is 3000 and profit of company X in 2013 is equal to profit of company Z in 2014 then what is the profit of company X in 2013

(a) 1500 (b) 4000 (c) 3500

(d) 2000 (e) 2500

Q133. What is the average percentage increase in profit for company Y over all the years.

(a) 49% (b) 32% (c) 23%
(d) 38% (e) 35%

Q134. What was the approximate percent increase in percent increase of profit of company X in the year 2014 from its previous year

(a) 60% (b) 65% (c) 55%
(d) 50% (e) 70%

Q135. If profit earned by company Y in 2014 is 27,000 and by company Z in 2014 is 43500 then what is the total profit earned by them in year 2013?

(a) 25,000 (b) 35,000 (c) 40,000
(d) 50,000 (e) None of these

S131. Ans.(a)

Sol. Profit in 2013 = $2000 \times \frac{130}{100}$

= 2600

Total revenue = 50,000 + 2600

= 52600

S132. Ans.(d)

Sol. Profit of company X in 2013 = $\frac{3000 \times 100}{150}$

= 2000

S133. Ans.(e)

Sol. Required average = $\frac{45 + 25 + 30 + 35 + 35 + 40}{6}$

= $\frac{210}{6}$

= 35%

S134. Ans.(a)

Sol. Required percentage = $\frac{40 - 25}{25} \times 100$

= $\frac{15}{25} \times 100$

= 60%

S135. Ans.(d)

Sol. Profit earned by Y in 2013 = $\frac{27000 \times 100}{135}$

= 20,000

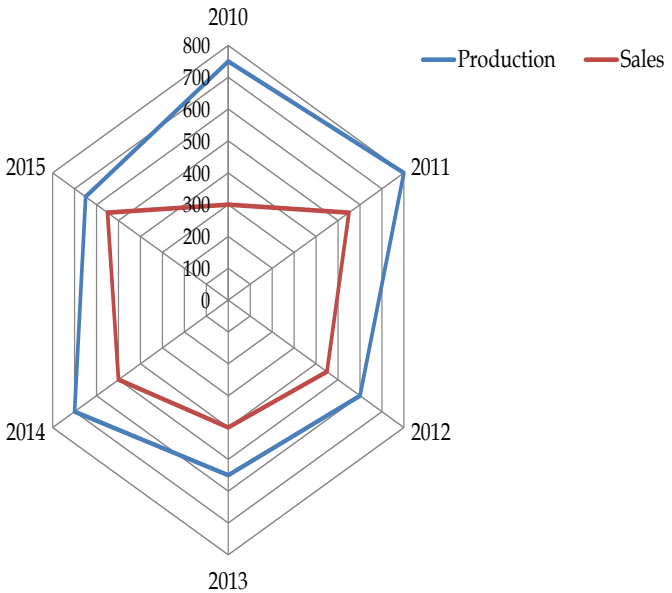
Profit earned by Z in 2013 = $\frac{43500 \times 100}{145}$

= 30,000

Total profit = 50,000

Directions (136-140): Study the following graph carefully and answer the following question.

The graph below represents the production (in tonnes) and sales (in tonnes) of a company X from 2010-2015



Q136. If production of company X and another company Y is in the ratio 14 : 13 in year 2014 then production of company Y in 2014 is what percent more or less than production of company X in 2010.

(a) $13\frac{1}{3}\%$ (b) $33\frac{1}{3}\%$ (c) $66\frac{2}{3}\%$

(d) $16\frac{2}{3}\%$ (e) None of these

Q137. If production of company X in 2016 is 120% of its production in 2015 then what is the ratio of sales company X in 2010 to the production of company X in 2016.

(a) $\frac{7}{9}$ (b) $\frac{13}{20}$ (c) $\frac{20}{13}$

(d) $\frac{5}{13}$ (e) $\frac{7}{13}$

Q138. If production cost is Rs. 1,500 per tonne and sale is at the rate of Rs. 2,800 per tonne over all years then what is the ratio of profit or loss of company X in 2013 to the profit or loss in year 2014. (Profit = Income through sales – Production cost)

(a) $\frac{59}{70}$ (b) $\frac{20}{23}$ (c) $\frac{53}{94}$

(d) $\frac{27}{38}$ (e) None of these

Q139. If production cost in year 2013 is 150 per tonne and production cost increases by 10% every year after 2013 then what is the average production cost of company X over all years after year 2013?

(a) 12,20,239 (b) 1,16,737.5 (c) 2,22,467
(d) 1,33,647 (e) None of these

Q140. If 35% of production of company X in 2010 is added to the sale of company X in 2012 then total sale of company X in 2012 is what percent of the total sale of company X over all the years now? (approximately)

(a) 14% (b) 18% (c) 35%
(d) 28% (e) 24%

S136. Ans.(a)

Sol. Production of company Y in 2014 = $\frac{700}{14} \times 13 = 650$

Required percentage = $\frac{100}{750} \times 100$

$= \frac{40}{3}\%$

$13\frac{1}{3}\%$ less

S137. Ans.(d)

Sol. Production of company X in 2016 = $\frac{120}{100} \times 650 = 780$

Required ratio = $\frac{300}{780}$

$= \frac{5}{13}$

S138. Ans.(a)

Sol. Cost of production in 2013 = 1500 × 550

= Rs. 8,25,000

Total Income through sales = 2800 × 400

= Rs. 11, 20,000

Profit in 2013 = 11,20,000 − 8,25,000

= Rs. 2,95,000

Cost of production in 2014 = Rs. 1500 × 700

= Rs. 10,50,000

Total Income through sales = Rs. 2800 × 500

= Rs. 14,00,000

Profit in 2014 = 3,50,000

Required ratio = $\frac{295}{350} = \frac{59}{70}$

S139. Ans.(b)

Sol. Total production cost in 2014 and 2015 = 165 × 700 + 181.5 × 650

= 1,15,500 + 1,17,975

= 2,33,475

Required average = $\frac{2,33,475}{2}$ = 1,16,737.5

S140. Ans.(e)

Sol. Total sale of company X in 2012 = $450 + \frac{35}{100} \times 750 = 712.5$

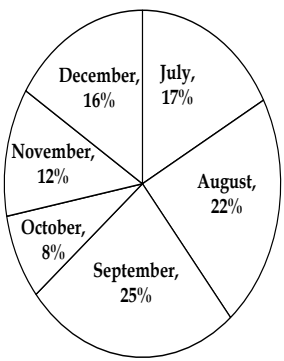
Required percentage = $\frac{712.5}{300 + 550 + 450 + 400 + 500 + 550 + 262.5} \times 100$

$= \frac{712.5}{3012.5} \times 100 = 23.65\% \sim 24\%$

Directions (141-145): Study the following pie-chart and table carefully and answer the questions given below:

Percentage wise distribution of the number of mobile phones sold by a shopkeeper during six months

Total number of mobile phones sold = 45000



The ratio between the numbers of mobile phones sold of Company A and Company B during six months

Month	Ratio
July	8 : 7
August	4 : 5
September	3 : 2
October	7 : 5
November	7 : 8
December	7 : 9

Q141. What is the ratio of the number of mobile phones sold of Company B during July to those sold during December of the same company?

(a) 119 : 145 (b) 116 : 135 (c) 119 : 135

(d) 119 : 130 (e) None of these

Q142. If 35% of the mobile phones sold by Company A during November were sold at a discount, how many mobile phones of Company A during that month were sold without a discount?

(a) 882 (b) 1635 (c) 1638
(d) 885 (e) None of these

Q143. If the shopkeeper earned a profit of Rs. 433 on each mobile phone sold of Company B during October, what was his total profit earned on the mobile phones of that company during the same month?

(a) Rs. 6,49,900 (b) Rs. 6,45,900 (c) Rs. 6,49,400
(d)Rs. 6,49,500 (e) None of these

Q144. The number of mobile phones sold of Company A during July is approximately what percent of the number of mobile phones sold of Company A during December?

(a) 110 (b) 140 (c) 150
(d) 105 (e) 130

Q145. What is the total number of mobile phones sold of Company B during August and September together?

(a) 10000 (b) 15000 (c) 10500
(d) 9500 (e) None of these

S141. Ans.(c)
Sol.

Total number of mobiles sold in the month of July = $45000 \times \frac{17}{100} = 7650$

Mobile phones sold by Company B in the month of July = $7650 \times \frac{7}{15} = 3570$

Total numbers of mobile phones sold in the month of December = $45000 \times \frac{16}{100} = 7200$

Mobile phones sold by Company B in the month of December = $7200 \times \frac{9}{16} = 4050$

$\therefore$ Required ratio = $\frac{3570}{4050} = \frac{357}{405} = \frac{119}{135} = 119 : 135$

S142. Ans.(c)
Sol.

Number of mobile phones sold in the month of November = $45000 \times \frac{12}{100} = 5400$

Number of mobile phones sold by Company A in the month of November = $5400 \times \frac{7}{15} = 2520$

$\therefore$ Number of mobile phones sold without discount in the month of November by Company A

$= 2520 \times \frac{65}{100} = 2520 \times 0.65 = 1638$

S143. Ans. (d)
Sol.

Number of mobile phones sold in the month of October = $45000 \times \frac{8}{100} = 3600$

$\therefore$ Number of mobile phones sold by Company B in the month of October = $3600 \times \frac{5}{12} = 1500$

$\therefore$ Total profit earned by Company B in the month of October = $1500 \times 433 = 649500$

S144. Ans.(e)

Sol.

Number of mobile phones sold in the month of July = $45000 \times \frac{17}{100} = 7650$

Number of mobile phones sold by Company A in the month of July = $7650 \times \frac{8}{15} = 4080$

Number of mobile phones sold in the month of December = $45000 \times \frac{16}{100} = 7200$

Number of mobile phones sold by Company A in the month of December = $7200 \times \frac{7}{16} = 3150$

$\therefore$ Required % = $\frac{4080}{3150} \times 100 = 129.52 \approx 130$

S145. Ans.(a)

Sol.

Number of mobile phones sold in the month of August = $\frac{22}{100} \times 45000 = 9900$

Number of mobile phones sold in the month of September = $\frac{25}{100} \times 45000 = \frac{1}{4} \times 45000 = 11250$

Number of mobile phones sold by Company B in the month of August = $9900 \times \frac{5}{9} = 5500$

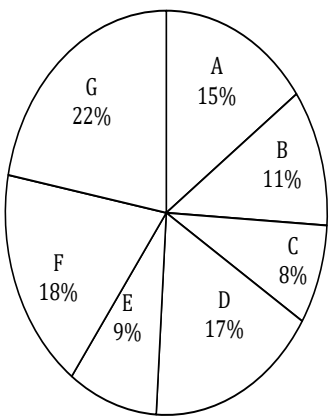
Number of mobile phones sold by Company B in September = $11250 \times \frac{2}{5} = 4500$

Total number of mobile phones sold in August and September by Company B = 5500 + 4500 = 10000

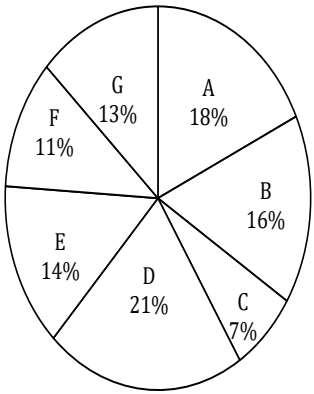
Directions (146-150): These questions based on the following graphs

Classification of appeared candidates in a competitive test from different states and qualified candidates from those states.

Appeared candidates = 45000.



Qualified candidates = 9000



Q146. What is the ratio of the number of appeared candidates from states C and E together to that of the appeared candidates from sates A and F together?

(a) 17 : 33 (b) 11 : 13 (c) 13 : 27
(d) 17 : 27 (e) None of these

Q147. In which state, the percentage of qualifies candidates with respect to that of appeared candidates is minimum?

(a) C (b) F (c) D
(d) E (e) G

Q148. What is the difference between the number of qualified candidates of states D and those of G?

(a) 690 (b) 670 (c) 780
(d) 720 (e) None of these

Q149. What is the percentage of qualified candidates with respect to appeared candidates from states B and C taken together? (rounded to two decimal places)

(a) 23.11 (b) 24.21 (c) 21.24
(d) 23 (e) None of these

Q150. What is the ratio between the number of candidates qualified from states B and D together to the number of candidates appeared from states 'C', respectively?

(a) 8 : 37 (b) 11 : 12 (c) 37 : 40
(d) 7 : 37 (e) None of these

S146. Ans.(a)

Sol. Required ratio = $\frac{8+9}{15+18}$ = 17: 33.

S147. Ans.(e)

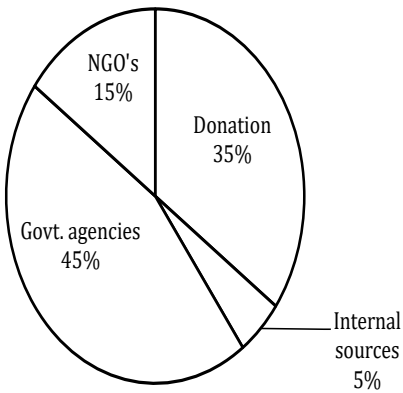
Sol. Here, do not find the ratio of number of qualified candidates that of the appeared. Simply check the ratio of % qualified candidates with respect to the appeared is the least for which state. Ans. = G.

S148. Ans.(d)
Sol. Required difference = (21 - 13)% of 9000 = 720.

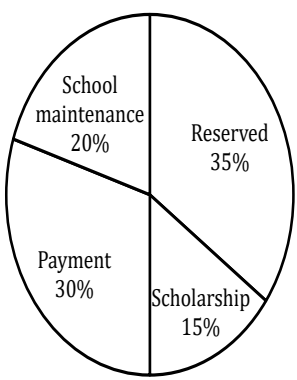
S149. Ans.(b)
Sol. Required % = $\frac{(16+7)\% \, of \, 9000}{(11+8)\% \, of \, 45000} \times 100 = 24.21\%$

S150. Ans.(c)
Sol. Required ratio = $\frac{(16+21)\% \, of \, 9000}{8\% \, of \, 45000} = 37 : 40$

Directions (151-155): Study the following pie-charts carefully and answer the questions given below it.
The entire fund that school gets from different sources in equal to Rs. 500 lakh



Sources of funds in school



Uses of funds by school

Q151. What is the difference between the funds acquired by school from NGO's and internal sources?
(a) Rs. 50 lakh (b) Rs. 45 lakh (c) Rs. 75 lakh
(d) Rs. 25 lakh (e) None of these

Q152. If the school managed school maintenance from the government agencies fund only, then how much fund from government agencies would still left for other use?
(a) Rs. 120 lakh (b) Rs. 150 lakh (c) Rs. 110 lakh
(d)Rs. 95 lakh (e) None of these

Q153. If scholarship has to be paid out of the donation fund, then what is the approximate per cent of donation fund used for his purpose?
(a) 43% (b) 53% (c) 37%
(d) 45% (e) 32%

Q154. What is the total amount used by the school for payment?
(a) Rs. 100 lakh (b) Rs. 110 lakh (c) Rs. 150 lakh
(d) Rs. 140 lakh (e) None of these

Q155. What amount of the fund is acquired by the school from government agencies?
(a) Rs. 220 lakh (b) Rs. 310 lakh (c) Rs. 255 lakh
(d) Rs. 225 lakh (e) None of these

S151. Ans.(a)
Sol. Required difference = (Percentage of fund acquired from NGO-Percentage of fund acquired from internal sources) of 500 lakh
= (15 - 5)% of 500 lakh = $\frac{500 \times 10}{100}$lakh = Rs. 50 lakh

S152. Ans.(e)
Sol. Fund from government agencies
= $\frac{500 \times 45}{100}$ = Rs. 225 lakh
Expenses in school maintenance
= $\frac{500 \times 20}{100}$ = Rs. 100 lakh
∴ Remaining found = (225 - 100) lakh
= Rs. 125 lakh

S153. Ans.(a)
Sol. Fund from donation = $\frac{500 \times 35}{100}$ = Rs. 175 lakh
Scholarship amount = $\frac{15 \times 500}{100}$ = Rs. 75 lakh
∴ Required percentage = $\frac{75}{175} \times 100 = 42.85\%$
= 43% (approx.)

S154. Ans.(c)
Sol. Total amount used by the school for payment
= $\frac{500 \times 30}{100}$ = Rs. 150 lakh

S155. Ans.(d)
Sol. Fund acquired from government agencies
= $\frac{500 \times 45}{100}$ = Rs. 225 lakh

Directions (156-160): In the following table, the Investment and profit of three Companies in different countries is given.

Investment (in mn $.)				Profit (in mn $.)		
State	**TCS**	**Infosys**	**Accenture**	**TCS**	**Infosys**	**Accenture**
Singapore	15000	–	25000	–	8000	12500
UK	–	7000	8000	–	–	14000
UAE	4000	5000	4500	–	–	–
Qatar	9000	10000	–	4500	6000	–
Malaysia	–	–	17000	20000	30000	40000

Note: Some values are missing. You have to calculate these values as per data given in the questions:-

Q156. If TCS invested his amount in SINGAPORE state for 9 years and Accenture invested his amount in the same country for 10 years then find the total profit made by all of them from SINGAPORE?

(a) mn $ 29250 (b) mn $ 24250 (c) mn $ 27250
(d) mn $ 31200 (e) None of these

Q157. If the total profit earned from UK by all of them is mn $ 32375 and each invested for 9 years then find the ratio of investment of TCS in UK to the profit of Infosys from SINGAPORE ?

(a) 16 : 7 (b) 7 : 16 (c) 8 : 13
(d) 13 : 8 (e) None of these

Q158. If TCS, Infosys and Accenture invested in UAE for 5 years, 8 years and 6 years respectively then profit earned by Accenture from UAE is what % of the profit earned by TCS and Infosys together from the same Country, if total profit earned by all of them from UAE state is 8700 mn $.

(a) 45% (b) 50% (c) 55%
(d) 40% (e) None of these

Q159. In Malaysia state total Investment of TCS and Infosys is 85000 mn $, while TCS and Infosys invested their amount for 4 years and 6 years respectively in the same country, then find the number of years that accenture invested his amount ?

(a) 8 years (b) 9 years (c) 20 years
(d) Can't be determined (e) None of these

Q160. Average Investment made by all of them in Qatar is $ 10,000 mn and average profit earned by all of them from the same state is $ 6000 mn, then profit earned by Accenture in the same country is what percent more/less than the amount invested by Accenture in the same state?

(a) $35\frac{1}{3}\%$ (b) $37\frac{6}{7}\%$ (c) $32\frac{7}{11}\%$
(d) $33\frac{7}{11}\%$ (e) $31\frac{9}{11}\%$

S156. Ans.(c)

Sol.

$$\frac{15000 \times 9}{25000 \times 10} = \frac{x}{12500}$$

$$\frac{27}{50} = \frac{x}{12500}$$

$x = \$\ 6750$ mn

$\therefore$ Required profit = 6750 + 8000 + 12500 = $ 27250 mn

S157. Ans.(b)

Sol.

$$\frac{7000}{8000} = \frac{P_{infosys}}{14000}$$

$P_{Infosys} = \$\ 12250$mn

$P_{tcs} = 32375 - 12250 - 14000$

$P_{tcs} = \$\ 6125$mn

Let Investment of TCS in UK = x

$$\therefore \frac{x}{7000} = \frac{6125}{12250}$$

$x = \$\ 3500$mn

Required Ratio = (3500) : (8000)

= 7 : 16

S158. Ans.(a)

Sol.

	TCS	:	Infosys	:	Accenture
Profit :	(4000×5)	:	(5000×8)	:	(4500×6)
	20	:	40	:	27

$\therefore P_{tcs} = \frac{20}{87} \times 8700$

=$ 2000 mn

$P_{infosys} = \frac{40}{87} \times 8700 = \$\ 4000$ mn

$P_{accenture} = \$\ 2700$ mn

Required % $= \frac{2700}{6000} \times 100 = 45\%$

Trick :

Required value = $\frac{27}{40+20} \times 100 = 45\%$

S159. Ans.(c)

Sol.

$$\frac{x \times 4}{(85{,}000 - x)\ 6} = \frac{20{,}000}{30{,}000}$$

$$\frac{2x}{3\ (85{,}000 - x)} = \frac{2}{3}$$

$6x = 2 \times 3 \times 85000 - 6x$

$12x = 6 \times 85000$

$x = \$\ 42500$ mn

$I_{tcs} = \$\ 42500$ mn

$\therefore I_{infosys} = \$\,42500$ mn

Let Required years = y

$\therefore \frac{42500 \times 6}{17{,}000 \times y} = \frac{30{,}000}{40{,}000}$

y = 20 years

S160. Ans.(e)

Sol.

$I_{accenture} = 30000 - 9000 - 10000$

$= \$\,11000$ mn

$P_{accenture} = 18000 - 4500 - 6000$

$= \$\,7500$ mn

Required % $= \frac{11000-7500}{11000} \times 100$

$= 31\frac{9}{11}\%$

Directions (161-165): A person purchased 5 Gadgets from a shop and sold them online. Given below is the data showing cost price, selling price and profit/loss percentage.

	C.P. (in Rs.)	Profit/Loss%	S.P. (in Rs.)
Smartphone	32445	–	40556.25
Laptop	–	Profit-15%	40940
Tablet	22150	Loss-12%	–
Digital camera	28295	–	31140
Smart Watch	–	Profit-25%	7075

Q161. Cost price of Laptop is what percent of selling price of Tablet? (approximate)

(a) 138% (b) 182% (c) 142%

(d) 154% (e) 186%

Q162. If there has been a profit of 12% on Tablet instead of 12% loss. Then the new S.P. is how much more than the original S.P.?

(a) 5216 (b) 5396 (c) 5336

(d) 5316 (e) None of these

Q163. Profit percentage on Digital camera is what percent more/less than profit percentage on Laptop?

(a) 50% more (b) 33.34% less (c) 33.67% more

(d) 50% less (e) 150% less

Q164. What is the ratio between profit percentage of Smart Watch to profit percentage of Smartphone?

(a) 5 : 3 (b) 3 : 2 (c) 3 : 5
(d) 2 : 5 (e) None of these

Q165. What is the overall profit/loss percentage? (approximate)

(a) 22.12% profit (b) 12.12% profit (c) 14.14% profit
(d) 33.12% loss (e) 15.15% loss

S161. Ans.(b)

Sol. Let cost price of Laptop = x

$x \times \frac{(100+15)}{100} = 40940$

$x = 35600$

Selling price of Tablet = $22150 \times \frac{(100-12)}{100} = 19492$

Required percentage = $\frac{35600}{19492} \times 100 \approx 182\%$

S162. Ans.(d)

Sol. Original S.P.= $22150 \times \frac{88}{100} = 19492$

New S.P.= $22150 \times \frac{(100+12)}{100} = 24808$

Difference = 5316

S163. Ans.(b)

Sol. Percentage profit on Digital camera = $\frac{31140-28295}{28295} \times 100 = 10.05\%$

Profit percentage on Laptop = 15%

Required percentage = $\frac{(15-10)}{15} \times 100 = \frac{100}{3} = 33.34\%\ less$

S164. Ans.(e)

Sol. Profit percentage on $Smartphone$ = $\frac{40556.25-32445}{32445} \times 100 = 25\%$

Profit percentage on Smart Watch= 25%

Required Ratio = 1 : 1

S165. Ans.(b)

Sol. Overall cost price of all items together = 32445 + 35600 + 22150 + 28295 + 5660 = 124150

Overall selling price of all items together = 40556.25 + 40940 + 19492 + 31140 + 7075 = 139203.25

Profit percentage = $\frac{139203.25-124150}{124150} \times 100 \approx 12.12\%$ profit

Directions (166-170): Study the table and answer the given questions.

Data related to the number of employees in five different companies in December 2012

Company	Total number of Employees	Out of total number of employees		
		Percentage Of Science graduates	Percentage of Commerce graduates	Percentage of Arts graduates
M	1050	32%	–	–
N	700	–	31%	40%
O	–	30%	30%	–
P	–	–	40%	20%
Q	–	35%	50%	–

Note:

(I) Employees of the given companies can be categorised only in three types: Science graduates, Commerce graduates and Arts graduates

(II) A few values are missing in the table (indicated –). A candidate is expected to calculate the missing value, if it is required to answer the given question, on the basis of the given data and information.

Q166. What is the difference between the number of Arts graduate employees and Science graduate employees in Company N?

(a) 87 (b) 89 (c) 77

(d) 81 (e) 73

Q167. The average number of Arts graduate employees and commerce graduate employees in Company Q was 312. What was the total number of employees in Company Q?

(a) 920 (b) 960 (c) 1120

(d) 1040 (e) 1080

Q168. If the ratio of the number of Commerce graduate employees to that of Arts graduate employees in Company M was 10 : 7, what was the number of Arts graduate employees in M?

(a) 294 (b) 266 (c) 280

(d) 308 (e) 322

Q169. The total number of employees in Company N increased by 20% from December 2012 to December 2013. If 20% of the total number of employees in Company N in December 2013 were Science graduates, what was the number of Science graduate employees in company N in December 2013?

(a) 224 (b) 266 (c) 294
(d) 252 (e) 168

Q170. The total number of employees in Company P was 3 times the total number of employees in Company O. If the difference between the number of Arts graduate employees in Company P and that in Company O was 180, what was the total number of employees in Company O?

(a) 1200 (b) 1440 (c) 720
(d) 900 (e) 1080

S166. Ans.(c)

Sol. Total number of employees in company N = 700
Percentage of Science graduate employees = [100 – (31 + 40)] = 29%
Now, percentage difference between Arts graduate and science graduate employees
= (40 – 29)% = 11%
11% of 700 = 77
Therefore, difference = 77

S167. Ans.(b)

Sol. The percentage of Arts graduate employees in Company Q = 100 – 35 – 50 = 15%
Now, the percentage of Arts graduate employees and Commerce and Arts = 50 + 15 = 65%
Average = 312
Therefore, the total number of employees in commerce and Arts = 2 × 312
Let the total employees in Company Q be x
Then, 65% of x = 2 × 312
x = 960

S168. Ans.(a)

Sol. The percentage of commerce graduate and Arts graduate employees in company M
= 100 – 32 = 68%
Now, the percentage of Arts graduate employees = $\frac{68 \times 7}{17} = 28\%$
the percentage of Commerce graduate employees = $\frac{68 \times 10}{17} = 40\%$
The number of arts graduate employees in company M = $\frac{1050 \times 28}{100} = 294$

S169. Ans.(e)

Sol. The number of employees in company N in December 2012 = 700
The number of employees in company N in December 2013 = $\frac{700 \times 120}{100} = 840$
Number of Science graduate employees in company N in December 2013 = $\frac{20 \times 840}{100} = 168$

S170. Ans.(d)
Sol. The percentage of Arts graduate employees in company O = 100 – 30 – 30 = 40%
The percentage difference between Arts graduate employees in company O and P = 40 – 20 = 20%
Now, let the number of employees in company O be x
Then, x × 20% = 180
x = 900

Directions (171-175): Study the table carefully and answer the given questions.
Data related to number of candidates appeared and qualified in a competitive exam from 2 states during 5 years

Years	State P		State Q	
	Number of appeared candidates	Percentage of appeared candidates who qualified	Number of appeared candidates	Percentage of appeared candidates who qualified
2006	450	60%	–	30%
2007	600	43%	–	45%
2008	–	60%	280	60%
2009	480	70%	550	50%
2010	380	–	400	–

Q171. Out of the number of qualified candidates from State P in 2008, the respective ratio of male and female candidates is 11 : 7. If the number of female qualified candidates from State P in 2008 is 126, what is the number of appeared candidates (both male and female) from State P in 2008?
(a) 630 (b) 510 (c) 570
(d) 690 (e) 540

Q172. The number of appeared candidates from State Q increased by 100% from 2006 to 2007. If the total number of qualified candidates from State Q in 2006 and 2007 together is 408, what is the number of appeared candidates from State Q in 2006?
(a) 380 (b) 360 (c) 340
(d) 320 (e) 300

Q173. What is the difference between the number of qualified candidates from State P in 2006 and that in 2007?
(a) 12 (b) 22 (c) 14
(d) 24 (e) 16

Q174. If the average number of qualified candidates from State Q in 2008, 2009 and 2010 is 210, what is the number of qualified candidates from State Q in 2010?
(a) 191 (b) 195 (c) 183
(d) 187 (e) 179

Q175. If the respective between the number of qualified candidates from State P in 2009 and 2010 is 14 : 9, what is the number of qualified candidates from State P in 2010?

(a) 252 (b) 207 (c) 216
(d) 234 (e) 198

S171. Ans.(e)

Sol. No. of qualified candidates in 2008 = $\frac{3x}{5}$

No. of female qualified from state P

$= \frac{7}{18} \times \frac{3x}{5}$

$= \frac{7x}{30}$

$\frac{7x}{30} = 126$

$x = 30 \times 18 = 540$

∴ Required no. of appeared candidates = 540

S172. Ans.(c)

Sol. Let no. of appeared candidates from state Q in 2006 = 100

Let no. of appeared candidates from state in 2007 = 200

∴ $30 + 90 \rightarrow 408$

$1 \rightarrow \frac{408}{120}$

$100 \rightarrow \frac{408}{120} \times 100 = 340$

S173. Ans.(a)

Sol. Required difference = $\frac{60}{100} \times 450 - \frac{43}{100} \times 600$

= 270 – 258

= 12

S174. Ans.(d)

Sol. Let required no. of candidates = x

$\therefore \frac{28 \times 6 + 55 \times 5 + x}{3} = 210$

168 + 275 + x = 630

x = 630 – 443

x = 187

S175. Ans.(c)

Sol.

$\frac{48 \times 7}{x} = \frac{14}{9}$

x = 24 × 9

x = 216

Directions (176-180): In the following table, investments and profit of three persons is given for different years in a joint business.

	Investments (in Rs.)			Profit (in Rs.)		
Year	A	B	C	A	B	C
2012	25500	31500	34500	127500	–	172500
2013	–	7500	–	–	18750	138750
2014	–	10050	12000	–	–	21000
2015	–	–	13500	75000	66000	36000
2016	16500	45000	–	–	–	–

Note:

1. Apart from year 2015, they invested the amounts for same period.
2. Some values are missing. You have to calculate these value as per given data.

Q176. If the total profit in 2014 is 59587.50Rs. , then find the ratio of the investment of B in 2013 to the investment of A in 2014.

(a) 5 : 8 (b) 10 : 27 (c) 5 : 7
(d) 5 : 9 (e) None of these

Q177. In year 2015, A and B invested their amount for 6 months and 4 months respectively and B investedRs.24750 then find the number of months that C invested his amount for?

(a) 3 months (b) 6 months (c) 2 months
(d) 4 months (e) 1 month

Q178. Total profit earned by B in year 2012 is how much less (in Rs.) than the profit earned by him in the year 2014?

(a) Rs. 176575.5 (b) Rs. 139912.5 (c) Rs. 193825
(d) Rs. 185050 (e) None of these

Q179. Investment made by A in 2016 is approximately what % more/less than the investment made by C in 2013?

(a) 31% (b) 70% (c) 40%
(d) 68% (e) 79%

Q180. Total profit earned by all in 2016 is 578340Rs. and the ratio of investment made by A and B together and investment made by B and C together is 123 : 137. Then find the difference between the profit made by A and C in 2016 ?

(a) 47628 (b) 59428 (c) 69478
(d) 45928 (e) None of these

S176. Ans.(a)

Sol. Let profit of B in 2014 = x

$\therefore \frac{12000}{21000} = \frac{10.050}{x}$

x = 17587.5 Rs.

Profit of A in 2014 = 59587.5 – 178587.5 – 21000

= 21000 Rs.

$\therefore$ Required Ratio = (7500) :$\left(\frac{12\times21}{21}\right) \times 1000$

= 7500 : 12000

= 5 : 8

S177. Ans.(d)

Sol. Let C invested for x months, then

$\frac{24750 \times 4}{13500 \times x} = \frac{66000}{36000}$

$\Rightarrow$ x = 4

S178. Ans.(b)

Sol. Let profit earned by B in year 2012 = x

Profit earned by B in year 2014 = y

$\frac{31500}{x} = \frac{34500}{172500}$

x = 157500 Rs.

And, $\frac{12000}{21000} = \frac{10050}{y}$

y = 17587.5 Rs.

Required Difference = 157500 - 17587.5 =139912.5

S179. Ans.(b)

Sol. Required % = $\frac{55500-16500}{55500} \times 100$

$\approx$ 70%

S180. Ans.(a)

Sol.

Investment made by C in 2016 = $\frac{(16500 + 45000)}{123} \times 137 - 45000$

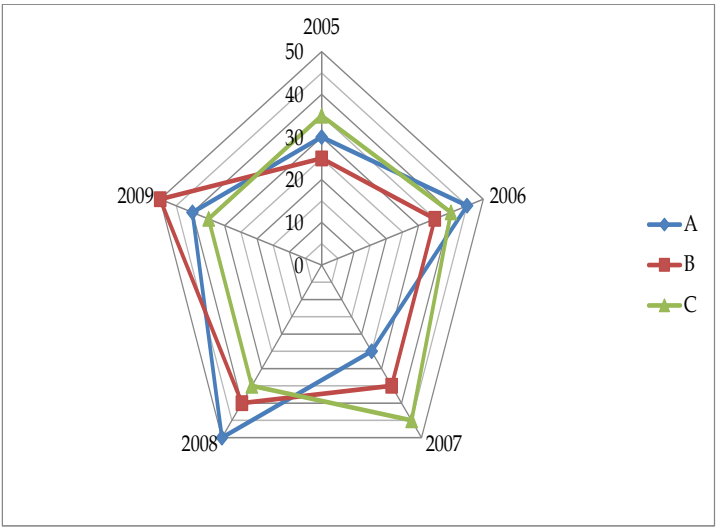
= 23500 Rs.

Ratio of their investment = 165 : 450 : 235

= 33 : 90 : 47

Difference= $\frac{(47 - 33)}{170} \times 578340 = 47628$

Directions (181-185): The following bar graph shows the production (in lakh tonnes) of 3 companies A, B and C in different years. Study the graph and answer the following questions:



Q181. The average production (in lakh tonnes) of company A over the given years is:

(a) 32 (b) 36 (c) 38
(d) 35 (e) None of these

Q182. The total production of all 3 companies together in 2008 is what percent more/less than that in 2006? (rounded off to two decimal points)

(a) 4.67% (b) 5.17% (c) 5.67%
(d) 4.17% (e) 6.67%

Q183. The total production of all 3 companies together is 2nd lowest in

(a) 2005 (b) 2006 (c) 2007
(d) 2008 (e) 2009

Q184. What is the percentage decrease in total production of all 3 companies together in 2007 as compared to previous year?

(a) 10.5% (b) 11.5% (c) 9.5%
(d) 12.5% (e) None of these

Q185. What is the ratio of total production of company B to that of company C in all years together?

(a) 38 : 35 (b) 38 : 37 (c) 35 : 38
(d) 37 : 38 (e) None of these

S181. Ans.(c)

Sol. Required average = $\frac{190}{5}$ = 38 lakh tonnes

S182. Ans.(d)

Sol. Required percentage = $\frac{(125-120)}{120} \times 100 = 4.17\%$

S183. Ans.(c)

Sol. Total production is 2nd lowest in 2007 i.e. 105 lakh tonnes

S184. Ans.(d)

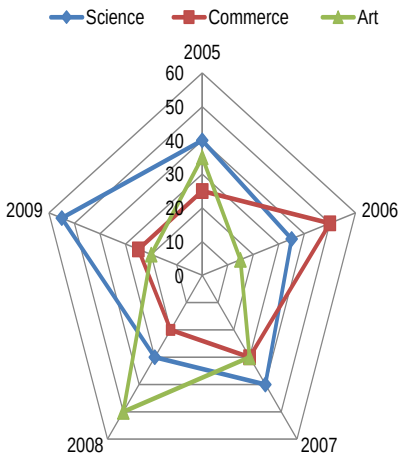
Sol. Required percentage = $\frac{15}{120} \times 100 = 12.5\%$

S185. Ans.(d)

Sol. Required ratio = $\frac{185}{190}$ = 37 : 38

Directions (186-190): Read the following graph and table carefully and answer the questions given below.

Percentage of admitted students in different discipline from 2005 to 2009



Total number of admitted students in different years	
Year	**Total number of students**
2005	12560
2006	14820
2007	13850
2008	16580
2009	11220

Q186. What is the average number of students in Arts in 2008 and 2009 together?

(a) 5182 (b) 5475 (c) 5318
(d) 5267 (e) None of these

Q187. The number of students in Science in 2008 is approximately what percent of the number of students in commerce in 2006?

(a) 67 (b) 72 (c) 63
(d) 58 (e) 78

Q188. What is the difference between the number of students in Science in 2006 and number of students of Commerce in 2008?

(a) 1625 (b) 1546 (c) 1871
(d) 1781 (e) None of these

Q189. What is the difference between the number of students in Arts in 2008 and number of students in Science in 2006?

(a) 3210 (b) 3103 (c) 3325
(d) 3014 (e) None of these

Q190. What is the total number of students in Commerce in all the years?

(a) 28026 (b) 21642 (c) 22510
(d) 19441 (e) None of these

S186. Ans.(d)

Sol. Average = $\frac{10534}{2}$ = 5267.

S187. Ans.(a)

Sol. Required percent = $\frac{4974}{7410} \times 100$ = 67% (approx.)

S188. Ans.(c)

Sol. Difference = 5187 – 3316 = 1871.

S189. Ans.(b)

Sol. Difference = 8290 – 5187 = 3103

S190. Ans.(e)

Sol. Total number = 20826.

Directions (191-195): There are five students who appeared for RBI Grade B exam. Paper consists of 100 questions with 1 mark for each correct answer and 0.25 marks for each wrong answer.

Students	Questions attempted	Right Questions	Wrong Questions	Marks obtained
Aditya	78	–	–	70.5
Puskar	92	76	–	–
Anshuman	98	–	36	–
Alka	–	30	–	27.25
Avanish	56	–	–	53.50

Q191. Difference between total right number of questions of all students together and total wrong no. of questions of all students together is

(a) 141 (b) 161 (c) 223
(d) 156 (e) None of these

Q192. Marks obtained by Aditya and Puskar together is what % of the marks obtained by Anshuman, Avanish and Alka together? (rounded off to 2 decimal places)

(a) 106.54% (b) 91.16% (c) 95.20%
(d) 96.71% (e) 101.71%

Q193. If the penalty of wrong answer is 0.33 then marks obtained by Aditya, Anshuman and Puskar together is

(a) 192.21 (b) 224.19 (c) 190.86
(d) 219.14 (e) 194.22

Q194. If the passing % marks in the exam is 50 marks than at least how many questions has to be answered right by Puskar? (He attempted 92 questions)

(a) 58 (b) 56 (c) 59
(d) 55 (e) 60

Q195. What is the percent of marks obtained by all of them together?

(a) 59.03% (b) 53.15% (c) 52.53%
(d) 45.05% (e) 55.25%

S191. Ans.(c)

Sol. Required difference = (72 + 76 + 62 + 30 + 54) – (6 + 16 + 36 + 11 + 2)
= 294 – 71 = 223

S192. Ans.(a)

Sol. Required % = $\frac{70.5+72}{53+27.25+53.50} \times 100$
= 106.54%

S193. Ans.(c)

Sol. Required marks = (72 + 76 + 62) – 0.33 (6 + 16 + 36) = 190.86

S194. Ans.(c)

Sol. By options

Let right Questions = 59

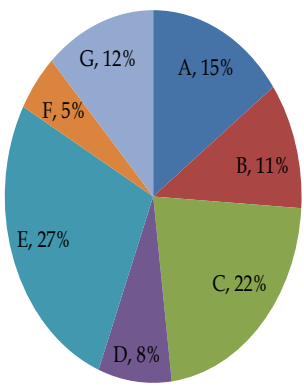
$\therefore$ marks = $92 - \frac{1}{4}(92 - 59) = 50.75$

S195. Ans.(e)

Sol. Required % = $\frac{70.5 + 72 + 53 + 27.25 + 53.50}{500} \times 100 = 55.25\%$

Directions (196-200): Seven companies A, B, C, D, E, F and G are engaged in production of two items I and II. Comparative data about production of these items by the companies is given in the following graph and table. Study them carefully and answer the questions given below.

Percentage of the total production produced by the seven companies



Cost of the total production (both items together) by seven companies = Rs 25 crores

Ratio of production between items I and II and the per cent profit earned for the two items

Company	Ratio of Production		Per cent profit earned	
	Item I	Item II	Item I	Item II
A	2	3	25	20
B	3	2	32	35
C	4	1	20	22
D	3	5	15	25
E	5	3	28	30
F	1	4	35	25
G	1	2	30.	24

Q196. What is the total cost of the production of item I by companies A and C together in Rs crore?

(a) 9.25 (b) 5.9 (c) 4.1625
(d) 4.9 (e) None of these

Q197. What is the amount of profit earned by company D on item II?

(a) Rs 3.125cr (b) Rs 31.25 cr (c) Rs 3.125 lakhs
(d) Rs 31.25 lakhs (e) None of these

Q198. Cost of production of item I by company F is what per cent of the cost of production of item II by company D?

(a) 16% (b) 33.33% (c) 66.67%
(d) 20% (e) None of these

Q199. What is the ratio of the cost of production of item I by company A to the cost of production of item I by company D?

(a) 3 : 5 (b) 1 : 2 (c) 2 : 1
(d) 2 : 3 (e) None of these

Q200. What is the total of the profit earned by company B on production of item I and the profit earned by company A on production of item II?

(a) Rs 9.78 cr (b) Rs 97.8 lakhs (c) Rs 52.8 lakhs
(d) Rs 5.28 cr (e) None of these

S196. Ans.(b)

Sol. Total cost of production by company A = $\frac{15}{100} \times 25 = 3.75$ crores = 3.75 crores

Total cost of production by Company C = $\frac{22}{100} \times 25 = 5.5$ crores

Cost of production of item I by Company A = $\frac{2}{5} \times 3.75 = 1.5$ crores

Cost of production of item I by Company C = $\frac{4}{5} \times 5.5 = 4.4$ crores

∴ Required total cost = 1.5 + 4.4 = 5.9 crores

S197. Ans.(d)

Sol. Required profit earned = $\frac{25}{100} \times \frac{5}{8} \times \frac{8}{100} \times 25 = 0.3125$ crores

= 31.25 lakhs

S198. Ans.(d)

Sol. Required %

$$= \frac{\frac{5}{100} \times \frac{1}{5} \times 25}{\frac{8}{100} \times \frac{5}{8} \times 25} \times 100$$

$$= \frac{0.25}{1.25} \times 100 = 20\%$$

S199. Ans.(c)

Sol. Required Ratio

$$= \frac{\frac{15}{100} \times \frac{2}{5} \times 25}{\frac{8}{100} \times \frac{3}{8} \times 25}$$

$$= \frac{30}{500} \times \frac{800}{24}$$

$$= \frac{5 \times 8}{5 \times 4}$$

$= 2 : 1$

S200. Ans.(b)

Sol. Required total profit

$$= \left(\frac{32}{100} \times \frac{3}{5} \times \frac{11}{100} \times 25\right) + \left(\frac{20}{100} \times \frac{3}{5} \times \frac{15}{100} \times 25\right)$$

$= 0.528 + 0.45$

$= 0.978$ crores

$= 97.8$ lakhs

UNIT – 8

INFORMATION & COMMUNICATION TECHNOLOGY

UNIT 8: INFORMATION AND COMMUNICATION TECHNOLOGY

Introduction

Many of the Internet projects require students to communicate with students from different states or countries via electronic mail or mailing lists or other news groups. Furthermore, The Internet should be a part of an integrated teaching system. It should be seen as a tool that supports and enhances learning and not as a means by itself. A poll result conducted by Global Strategy in April 1997 shows that this is the only way that the Internet adds value to the learning process.

Teaching using the Internet does not by itself lead to achieving curriculum objectives, because part from assisting in class preparation, a good knowledge of the Internet allows us to assist our students in their class activities involving the Internet. Besides, Professional Development is a key to updating skills and for career advancement for teachers. Among others, we can use the Internet to join a discussion group, subscribe to a news group, take classes, and keep in touch with professional colleagues.

To successfully use the Internet for teaching, we must know how to access the various services available through the Internet. Moreover, it has been reported that the majority of teachers who use the Internet in teaching are those who believe that the Internet is a new way for doing things. These teachers also use the Internet for shopping, banking, looking for mortgage rates, etc.

It is not the computer by itself but how they are used that makes the difference. They emphasize teacher training as a key to effective use of computer technology in the classroom. Every new technology brings with it positive and negative impact. Nobody has taken time to analyze the negative impact of exposing students to the Internet may have on their social development.

How the Internet Enhances the Teaching Process

We can use the Internet to add value, manage our classroom or improve the planning. We want to teach using the Internet because we want to change, improve, add a new dimension to our teaching, or vary the types and increase the quality of activities assigned to students. In learning, the students need some motivation. Allow them to use the Internet in their learning is a motivational push to who are bored by the traditional ways of information delivery, and thereby expedite the transfer of information from the short-term memory to the long-term memory. The Internet allows us to motivate some of the lost students in the class, and thereby accelerate the assimilation process.

According to an African proverb, a person who asks questions understands a new language faster. Using the Internet for educational activities provides a different avenue for discovery through questioning, and for critical evaluation of information. It is also important that we answer students' questions properly and timely. This is why we must constantly retrain according to the needs of the time. For this information age, we must be vexed with the personal and educational uses of the Internet.

Generally, Communication is a way of using knowledge. It is a source for re-enforcement. The Internet promotes fast communication across geographical barriers, and therefore gives students an opportunity to communicate early in life with a broad range of people not imagined possible before. Also using knowledge in different settings give a better understanding of the different shades of meaning of the concepts involved in a giving learning situation.

Besides to manage the class room, you can post class lessons, homework problems, and practice exams on the Net for students to access from home, from the library, or from any place that has access to the Net. Parents can access the Web pages to confirm the homework problems their children are required to do. Moreover, the homework could be structured in such a way that the student can progress from simpler to more challenging activities by means of hyperlinks. In addition to posting class lessons and homework, we can have a class bulletin board on web site. In this way, students can get involved in class discussions in a manner not possible in the classroom. This medium can also be used to resolve problems between class periods.

In conclusion, the Internet allows you to add content to your lessons and to disseminate useful information to students and parents without waste of valuable class time and those give many advantages for students in learning.

Hilts and Turroff (1985) and Hilts (1994) suggest that this flexibility supports collaborative learning among students who can therefore participate at times and places of their choosing. Hilts (1994 : 10) states that : Students may participate at any time of the day or night that they have the time and the inclination. Opportunities for feedback from the instructor and interaction with other students are not limited to a few fixed times per week.

Advantages of Students Using ICT for Learning

As was pointed out previously, the Internet provides students with the tools they need to discover and own knowledge. And give students the hooks and templates they need to fasten information to the long-term memory. There are some advantages of student using ICT for learning :

1. Motivating Factor.

The Internet can act as a motivating tool for many students. Young people are very captivated with technology. Educators must capitalize on this interest, excitement, and enthusiasm about the Internet for the purpose of enhancing learning. For already enthusiastic learners, the Internet allows you to provide them with additional learning activities not readily available in the classroom.

2. Fast Communication.

The Internet promotes fast communication across geographical barriers. Your students can join collaborative projects that involve students from different states, countries or continents. This type of learning experience was not possible before the Internet. This is a unique learning experience very essential for each of our students, as the world is becoming one big community.

3. Cooperative Learning.

The Internet facilitates cooperative learning, encourages dialogue, and creates a more engaging classroom. For example, a LISTSER V for our class will allow your students to get involved in class discussions through e-mails in a way not possible within the four walls of the classroom.

4. Locating Research Materials.

Apart from communication, research is what takes many people to the Internet. There are many more resources on the Internet than the school library can provide. We can encourage students to take advantage of this wealth of resources on the Internet for their research.

5. Acquiring Varied Writing Skills

If students are required to publish their work on the Internet, they have to develop hypertext skills. These skills help students gain experience in non-sequential writings. Moreover, and since the Internet is open to all with access, students publishing their work on the Internet are forced to be mindful of their language and to write to non-expert audience.

Disadvantages of Using ICT for Education

The use of the Internet for education is not without problems. Therefore, one should expect the problems to be encountered in using the Internet in teaching to be evolving as well. There are some disadvantage of using ICT for teaching and learning:

1. Plagiarism.

Apart from Web sites that claim to help students write term papers, there are numerous cases of students downloading information from the Net and turning them in for grades. We can minimize this problem by requiring students to cite research sources. There is an online service, Plagiarism.org at http://www.plagiarism.org/, which can assist us in minimizing cases of plagiarism in the class. This service claims to prevent plagiarism by determining if a term paper has been copied from the Internet or not.

2. Student Privacy.

Criminals, marketers, and other persons can easily get information from students when they are online. These could post danger to students' lives or may even lead to litigation against the school. To avoid this problem, students should be educated on the dangers of giving information to people online. Parents and teachers need to supervise students' online activities.

3. Low Income Groups.

According to the US Department of Education, over 50% of public schools with a high minority enrollment had a lower rate of Internet access than public schools with a low minority enrollment in 1997. The same was true of instructional rooms in those schools. In addition, students from low-income families may not have computers at home or may have computers at home with no access to the Internet. Consequently, students in low-income communities may be disadvantaged. To reduce the effect that social or economic status may have, we should give Internet assignments that students can easily complete while in school. If necessary, schools may need to keep computer labs open for longer and/or odd hours. The use of computers at public libraries should also be encouraged.

4. Preparation Time.

It takes a lot of preparation time to effectively use the Net for education. In addition to designing Internet based lesson plans, we may have to surf the Internet to download lesson plans and adapt them to support the curriculum objectives or visit sites to select those appropriate for classes. We have no choice but prepare in order to help your students become responsible user of the Internet.

New Administrative Responsibilities

Teaching using the Internet brings to bear a new set of administrative demands on the teacher and the school administration. These include development and implementation of acceptable use policy, training, developing new evaluation criteria as needed, and addressing parents' concerns.

5. Conclusion,

In sum, not all lessons can be incorporated into the Internet. In teaching using the Net, we have to convince that using the Net adds something new, some real value to our teaching. But also, students should be trained to use the available technology efficiently. We should collaborate with other teachers in the school and in the system, because cooperation and mutual understanding is very important especially when the school has few Internet accounts. Through the net, the student can communicate or collaborate with other students or experts in the field across geographically boundaries. Moreover, they can join a news group on a particular topic of interest. What is most interesting about the Net, as far as communication is concerned, is that it is race, age, national origin, and gender blind. The Net also enables students to publish projects' findings to be seen by their peers around the world. This might give some students the motivation they need to complete their work on time, to be mindful of their language. Therefore, every student can benefit from a Net communication project.

ICT TEMINOLOGY

AGP –>Accelerated Graphic Port
PC –>Personal Computer
EPROM –>Erasable Programmable Read Only Memory
BIOS –>Basic Input and Output System
HDD –>Hard Disk Drive
PCI –>Peripheral Component Interconnect
UNIVAC –>Universal Automatic Computer
GUI –>Graphic User Interface
USB –>Universal Serial Bus
VGA –>Visual Graphic Adaptor
MAN –>Metropolitan Area Network
ASCII –>American Standard Code for Information Interchange
WAN –>Wide Area Network
EBCDIC –>Extended Binary Coded Decimal Interchange Code
LAN –>Local Area Network

EEPROM/EAPROM –>Electrical Erasable/Alterable Programmable Read Only Memory
CPU –>Central Processing Unit
OS –>Operating System
ALU –>Arithmetic and Logic Unit
DVD –>Digital Versatile Disc
CD –> Compact Disk
ROM –>Read Only Memory
VDU –>Visual Display Unit
RAM –>Random Access Memory
ICT –>Information Communication Technology
PROM –>Programmable Read Only Memory
URL –>Universal Resource Locator
IDE –>Integrated Drive Electronics
FORTRAN –>Formular Translator
MOS –>Metaoxide Semi Conductor
ATX –>Advanced Technology Extended
SIM –>Subscriber Identification Module
MHZ –>Megahertz
ISP –>Internet Service Provider
GHZ –>Gigahertz
DBMS –>Database Management System
SQL –>Structured Query Language
RW –>Re-Writeable
SDT –>Serial Data Transmission
CAN –>Campus Area Network
SIMMs –>Single In-line Memory Module
PAN –>Personal Area Network
DIMMs –>Dual In-line Memory Module
CMOS –>Complimentary Metaoxide Semi Conductor
ENIAC –>Electronic Number Integrator And Calculator
CMD –> Command
EDSAC –>Electronic Dialog Storage Automatic Computer
MAC –>Media Acces Control
IC –>Integrated Circuit
LSIC –>Large Scale Integrated Circuit
DIR –>Directory
GIGO –>Gabbage In Gabbage Out
PHP –>PHP Hypertext Preprocessor
DOC –>Document
PDT –>Parallel Data Transmission
PDA –>Personal Digital Assistant
USSD –>Unstructured Supplementary Service Data
WWW –>World Wide Web
COBOL–>Common Basic Oriented Language
CCNP –>Cisco Certified Network Professionals
BASIC –>Beginner All Purpose Symbolic Instruction Code
CEH –>Certified Ethical Hacking
TCP –>Transmission Control Protocol
CSS –> Cascading Style Sheet
CISCO –>Computer Information System Company
XXS –>Cross Site Scripting
XML –>Extensible Mark-up Language
HTML –>Hypertext Markup Language
CCNA –>Cisco Certified Network Associate
RFI –>Remote File Inclusion
HTTP –>Hypertext Transfer Protocol
DDOS –>Distribution Denial Of Service
VPN –>Virtual Private Network
SEO –>Search Engine Optimization
IP - Internet Protocol
BIOS – This is the Basic Input Output System which controls the computer, telling it what operations to perform. These instructions are on a chip that connects to the motherboard.
BYTE – A byte is a storage unit for data.
CPU – This stands for the Central Processing Unit of the computer. This is like the computer's brain.
MAC – This is an abbreviation for Macintosh, which is a type of personal computer made by the Apple Computer company.

OS – This is the Operating System of the computer. It is the main program that runs on a computer and begins automatically when the computer is turned on.
PC – This is the abbreviation for personal computer. It refers to computers that are IBM compatible.
PDF– This represents the Portable Document Format which displays files in a format that is ready for the web.
RAM – This stands for Random Access Memory which is the space inside the computer that can be accessed at one time. If you increase the Amount of RAM, then you will increase the computer's speed. This is because more of a particular program is able to be loaded at one time.
ROM – This is Read Only Memory which is the instruction for the computer and can not be altered.
VGA – The Video Graphics Array is a system for displaying graphics. It was developed by IBM.
WYSIWYG – This initialism stands for What You See Is What You Get. It is pronounced "wizziwig" and basically means that the printer will print what you see on your monitor.
Connecting to the Internet Network Based
FTP – This is a service called File Transport Protocol which moves a file between computers using the Internet.
HTML – HyperText Markup Language formats information so it can be transported on the Internet.
HTTP – Hypertext Transfer Protocol is a set of instructions for the software that controls the movement of files on the Internet.
IP – This stands for Internet Protocol which is the set of rules that govern the systems connected to the Internet. IP Address is a digital code specific to each computer that is hooked up to the Internet.
ISP – The Internet Service Provider is the company which provides Internet service so you can connect your computer to the Internet.
LAN – This stands for Local Area Network which is the servers that your computer connects to in your geographic area.
PPP – Point-to-Point Protocol is the set of rules that allow your computer to use the Internet protocols using a phone line and modem.
URL – This is the Uniform Resource Locator which is a path to a certain file on the World Wide Web.
USB – The Universal Serial Bus is used for communications between certain devices. It can connect keyboards, cameras, printers, mice, flash drives, and other devices. Its use has expanded from personal computers to PDAs, smartphones, and video games, and is used as a power cord to connect devices to a wall outlet to charge them.
VR – Virtual Reality simulates a three-dimensional scene on the computer and has the capability of interaction. This is widely used in gaming.
VRML – Virtual Reality Mark-up Language allows the display of #D Images.

SOME COMMON EMAIL ABBREVIATIONS

Here is a list of email abbreviations that are commonly used to get your point across in less time and fewer keystrokes:
2G4U – Too Good For You
AWHFY – Are We Having Fun Yet?
AYPI – And Your Point Is?
GAL – Get A Life
GMTA – Great Minds Think Alike
J4F – Just For Fun
KISS – Keep it Simple, Stupid
QL – Quit Laughing!
RUOK – Are you Okay?
SITD – Still In The Dark
TIC – Tongue In Cheek
WYSIWYG – What You See Is What You Get
YYSSW – Yeah Yeah Sure Sure Whatever
ZZZ – Sleeping, Bored, Tired

Here are some Computer full forms

1. PAN - permanent account number.
2. PDF - portable document format.
3. SIM - Subscriber Identity Module.
4. ATM - Automated Teller machine.
5. IFSC - Indian Financial System Code.
6. FSSAI(Fssai) - Food Safety & Standards Authority of India.
7. Wi-Fi - Wireless fidelity.
8. GOOGLE - Global Organization Of Oriented Group Language Of Earth.
9. YAHOO - Yet Another Hierarchical Officious Oracle.
10. WINDOW - Wide Interactive Network Development for Office work Solution.
11. COMPUTER - Common Oriented Machine. Particularly United and used under Technical and Educational Research.
12. VIRUS - Vital Information Resources Under Siege.
13. UMTS - Universal Mobile Telecommunicati ons System.
14. AMOLED - Active-matrix organic light-emitting diode.
15. OLED - Organic light-emitting diode.
16. IMEI - International Mobile Equipment Identity.
17. ESN - Electronic Serial Number.
18. UPS - Uninterruptible power supply.
19. HDMI - High-Definition Multimedia Interface.

20. VPN - Virtual private network.
21. APN - Access Point Name.
22. LED - Light emitting diode.
23. DLNA - Digital Living Network Alliance.
24. RAM - Random access memory.
25. ROM - Read only memory.
26. VGA - Video Graphics Array.
27. QVGA - Quarter Video Graphics Array.
28. WVGA - Wide video graphics array.
29. WXGA - Widescreen Extended Graphics Array.
30. USB - Universal serial Bus.
31. WLAN - Wireless Local Area Network.
32. PPI - Pixels Per Inch.
33. LCD - Liquid Crystal Display.
34. HSDPA - High speed down-link packet access.
35. HSUPA - High-Speed Uplink Packet Access.
36. HSPA - High Speed Packet Access.
37. GPRS - General Packet Radio Service.
38. EDGE - Enhanced Data Rates for Global Evolution.
39. NFC - Near field communication.
40. OTG - On-the-go.
41. S-LCD - Super Liquid Crystal Display.
42. O.S - Operating system.
43. SNS - Social network service.
44. H.S - HOTSPOT.
45. P.O.I - Point of interest.
46. GPS - Global Positioning System.
47. DVD - Digital Video Disk.
48. DTP - Desk top publishing.
49. DNSE - Digital natural sound engine.
50. OVI - Ohio Video Intranet.
51. CDMA - Code Division Multiple Access.
52. WCDMA - Wide-band Code Division Multiple Access.
53. GSM - Global System for Mobile Communications.
54. DIVX - Digital internet video access.
55. APK - Authenticated public key.
56. J2ME - Java 2 micro edition.
57. SIS - Installation source.
58. DELL- Digital electronic link library.
59. ACER- Acquisition Collaboration Experimentation Reflection.
60. RSS - Really simple syndication.
61. TFT - Thin film transistor.
62. AMR- Adaptive Multi-Rate.
63. MPEG - moving pictures experts group.
64. IVRS - Interactive Voice Response System.
65. HP - Hewlett Packard.

Do we know actual full form of some words???

66. News paper = North East West South past and present events report.
67. Chess = Chariot, Horse, Elephant, Soldiers.
68. Cold = Chronic Obstructive Lung Disease.
69. Joke = Joy of Kids Entertainment.
70. Aim = Ambition in Mind.
71. Date = Day and Time Evolution.
72. Eat = Energy and Taste.
73. Tea = Taste and Energy Admitted.
74. Pen = Power Enriched in Nib.
75. Smile = Sweet Memories in Lips Expression.
76. etc. = End of Thinking Capacity
77. OK = Objection Killed
78. Or = Orl Korec (Greek Word)
79. Bye = Be with you Everytime.

CONCEPTS OF DATA REPRESENTATION IN DIGITAL COMPUTERS

Data and instructions cannot be entered and processed directly into computers using human language. Any type of data be it numbers, letters, special symbols, sound or pictures must first be converted into machine-readable form i.e. binary form. Due

to this reason, it is important to understand how a computer together with its peripheral devices handles data in its electronic circuits, on magnetic media and in optical devices.

Data representation in digital circuits

Electronic components, such as microprocessor, are made up of millions of electronic circuits. The availability of high voltage(on) in these circuits is interpreted as '1' while a low voltage (off) is interpreted as '0'.This concept can be compared to switching on and off an electric circuit. When the switch is closed the high voltage in the circuit causes the bulb to light ('1' state).on the other hand when the switch is open, the bulb goes off ('0' state). This forms a basis for describing data representation in digital computers using the binary number system.

Data representation on magnetic media

The laser beam reflected from the land is interpreted, as 1.The laser entering the pot is not reflected. This is interpreted as 0.The reflected pattern of light from the rotating disk falls on a receiving photoelectric detector that transforms the patterns into digital form. The presence of a magnetic field in one direction on magnetic media is interpreted as 1; while the field in the opposite direction is interpreted as "0".Magnetic technology is mostly used on storage devices that are coated with special magnetic materials such as iron oxide. Data is written on the media by arranging the magnetic dipoles of some iron oxide particles to face in the same direction and some others in the opposite direction

Data representation on optical media

In optical devices, the presence of light is interpreted as '1' while its absence is interpreted as '0'.Optical devices use this technology to read or store data. Take example of a CD-ROM, if the shiny surface is placed under a powerful microscope, the surface is observed to have very tiny holes called pits. The areas that do not have pits are called land.

Reason for use of binary system in computers

It has proved difficult to develop devices that can understand natural language directly due to the complexity of natural languages. However, it is easier to construct electric circuits based on the binary or ON and OFF logic. All forms of data can be represented in binary system format. Other reasons for the use of binary are that digital devices are more reliable, small and use less energy as compared to analog devices.

Bits, bytes, nibble and word

The terms bits, bytes, nibble and word are used widely in reference to computer memory and data size.

Bits: can be defined as either a binary, which can be 0, or 1.It is the basic unit of data or information in digital computers.

Byte: a group of bits (8 bits) used to represent a character. A byte is considered as the basic unit of measuring memory size in computer.

A nibble: is half a byte, which is usually a grouping of 4 bits.

Word: two or more bits make a word. The term word length is used as the measure of the number of bits in each word. For example, a word can have a length of 16 bits, 32 bits, 64 bits etc.

Conversion table

Traditional units						Decimal for comparison				
Name	**Symbol**	**Binary**	**Number of bytes**	**Equal to**		**Name**	**IEC**	**Decimal**	**Number of bits**	**Equal to**
Kilobyte	kB	2^{10}	1,024	1024 B		Kilobit	kbit	10^3	1,000	1000 bit
Megabyte	MB	2^{20}	1,048,576	1024 kB		Megabit	Mbit	10^6	1,000,000	1000 kbit
Gigabyte	GB	2^{30}	1,073,741,824	1024 MB		Gigabit	Gbit	10^9	1,000,000,000	1000 Mbit
Terabyte	TB	2^{40}	1,099,511,627,776	1024 GB		Terabit	Tbit	10^{12}	1,000,000,000,000	1000 Gbit
Petabyte	PB	2^{50}	1,125,899,906,842,624	1024 TB		Petabit	Pbit	10^{15}	1,000,000,000,000,000	1000 Tbit
Exabyte	EB	2^{60}	1,152,921,504,606,846,976	1024 PB		Exabit	Ebit	10^{18}	1,000,000,000,000,000,000	1000 Pbit
Zettabyte	ZB	2^{70}	1,180,591,620,717,411,303,424	1024 EB		Zettabit	Zbit	10^{21}	1,000,000,000,000,000,000,000	1000 Ebit
Yottabyte	YB	2^{80}	1,208,925,819,614,629,174,706,176	1024 ZB		Yottabit	Ybit	10^{24}	1,000,000,000,000,000,000,000,000	1000 Zbit

NUMBER SYSTEMS

Human beings use decimal (base 10) and duodecimal (base 12) number systems for counting and measurements (probably because we have 10 fingers and two big toes). Computers use binary (base 2) number system, as they are made from binary digital components (known as transistors) operating in two states - on and off. In computing, we also use hexadecimal (base 16) or octal (base 8) number systems, as a compact form for represent binary numbers.

1.1 Decimal (Base 10) Number System

Decimal number system has ten symbols: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9, called digits. It uses positional notation. That is, the least-significant digit (right-most digit) is of the order of 10^0 (units or ones), the second right-most digit is of the order of 10^1 (tens), the third right-most digit is of the order of 10^2 (hundreds), and so on. For example,

735 = 7×10^2 + 3×10^1 + 5×10^0

We shall denote a decimal number with an optional suffix D if ambiguity arises.

1.2 Binary (Base 2) Number System

Binary number system has two symbols: 0 and 1, called bits. It is also a positional notation, for example,

10110B = 1×2^4 + 0×2^3 + 1×2^2 + 1×2^1 + 0×2^0

We shall denote a binary number with a suffix B. Some programming languages denote binary numbers with prefix 0b (e.g., 0b1001000), or prefix bwith the bits quoted (e.g., b'10001111').

A binary digit is called a bit. Eight bits is called a byte (why 8-bit unit? Probably because 8=23).

1.3 Hexadecimal (Base 16) Number System

Hexadecimal number system uses 16 symbols: 0, 1, 2, 3, 4,5, 6, 7, 8, 9, A, B, C, D, E, and F, called hex digits. It is a positional notation, for example,

A3EH = 10×16^2 + 3×16^1 + 14×16^0

We shall denote a hexadecimal number (in short, hex) with a suffix H. Some programming languages denote hex numbers with prefix 0x (e.g., 0x1A3C5F), or prefix x with hex digit quoted (e.g., x'C3A4D98B').

Each hexadecimal digit is also called a hex digit. Most programming languages accept lowercase 'a' to 'f' as well as uppercase 'A' to 'F'.

Computers use binary system in their internal operations, as they are built from binary digital electronic components. However, writing or reading a long sequence of binary bits is cumbersome and error-prone. Hexadecimal system is used as a compact form or shorthand for binary bits. Each hexdigit is equivalent to 4 binary bits, i.e., shorthand for 4 bits, as follows:

0H (0000B) (0D)
1H (0001B) (1D)
2H (0010B) (2D)
3H (0011B) (3D)
4H (0100B) (4D)
5H (0101B) (5D)
6H (0110B) (6D)
7H (0111B) (7D)
8H (1000B) (8D)
9H (1001B) (9D)
AH (1010B) (10D)
BH (1011B) (11D)
CH (1100B) (12D)
DH (1101B) (13D)
EH (1110B) (14D)
FH (1111B) (15D)

1.4 Conversion from Hexadecimal to Binary

Replace each hex digit by the 4 equivalent bits, for examples,

A3C5H = 1010 0011 1100 0101B
102AH = 0001 0000 0010 1010B

1.5 Conversion from Binary to Hexadecimal

Starting from the right-most bit (least-significant bit), replace each group of 4 bits by the equivalent hex digit (pad the left-most bits with zero if necessary), for examples,

1001001010B = 0010 0100 1010B = 24AH
10001011001011B = 0010 0010 1100 1011B = 22CBH

It is important to note that hexadecimal number provides a compact form or shorthand for representing binary bits.

1.6 Conversion from Base r to Decimal (Base 10)

Given a n-digit base r number: dn-1 dn-2 dn-3 ... d3 d2 d1 d0 (base r), the decimal equivalent is given by:

dn-1 × r^(n-1) + dn-2 × r^(n-2) + ... + d1 × r^1 + d0 × r^0

For examples,

A1C2H = 10×16^3 + 1×16^2 + 12×16^1 + 2 = 41410 (base 10)
10110B = 1×2^4 + 1×2^2 + 1×2^1 = 22 (base 10)

1.7 Conversion from Decimal (Base 10) to Base r

Use repeated division/remainder. For example,

To convert 261D to hexadecimal:
261/16 => quotient=16 remainder=5
16/16 => quotient=1 remainder=0
1/16 => quotient=0 remainder=1 (quotient=0 stop)
Hence, 261D = 105H

The above procedure is actually applicable to conversion between any 2 base systems. For example,

To convert 1023(base 4) to base 3:
1023(base 4)/3 => quotient=25D remainder=0
25D/3 => quotient=8D remainder=1
8D/3 => quotient=2D remainder=2
2D/3 => quotient=0 remainder=2 (quotient=0 stop)
Hence, 1023(base 4) = 2210(base 3)

1.8 General Conversion between 2 Base Systems with Fractional Part

1. Separate the integral and the fractional parts.

2. For the integral part, divide by the target radix repeatable, and collect the remainder in reverse order.
3. For the fractional part, multiply the fractional part by the target radix repeatable, and collect the integral part in the same order.

Example 1:

Convert 18.6875D to binary

Integral Part = 18D

18/2 => quotient=9 remainder=0
9/2 => quotient=4 remainder=1
4/2 => quotient=2 remainder=0
2/2 => quotient=1 remainder=0
1/2 => quotient=0 remainder=1 (quotient=0 stop)
Hence, 18D = 10010B

Fractional Part = .6875D

.6875*2=1.375 => whole number is 1
.375*2=0.75 => whole number is 0
.75*2=1.5 => whole number is 1
.5*2=1.0 => whole number is 1
Hence .6875D = .1011B

Therefore, 18.6875D = 10010.1011B

Example 2:

Convert 18.6875D to hexadecimal

Integral Part = 18D

18/16 => quotient=1 remainder=2
1/16 => quotient=0 remainder=1 (quotient=0 stop)
Hence, 18D = 12H

Fractional Part = .6875D

.6875*16=11.0 => whole number is 11D (BH)
Hence .6875D = .BH

Therefore, 18.6875D = 12.BH

COMPUTER MEMORY & DATA REPRESENTATION

Computer uses a fixed number of bits to represent a piece of data, which could be a number, a character, or others. A n-bit storage location can represent up to 2^n distinct entities. For example, a 3-bit memory location can hold one of these eight binary patterns: 000, 001, 010, 011, 100, 101, 110, or 111. Hence, it can represent at most 8 distinct entities. You could use them to represent numbers 0 to 7, numbers 8881 to 8888, characters 'A' to 'H', or up to 8 kinds of fruits like apple, orange, banana; or up to 8 kinds of animals like lion, tiger, etc.

Integers, for example, can be represented in 8-bit, 16-bit, 32-bit or 64-bit. You, as the programmer, choose an appropriate bit-length for your integers. Your choice will impose constraint on the range of integers that can be represented. Besides the bit-length, an integer can be represented in various representation schemes, e.g., unsigned vs. signed integers. An 8-bit unsigned integer has a range of 0 to 255, while an 8-bit signed integer has a range of -128 to 127 - both representing 256 distinct numbers.

It is important to note that a computer memory location merely stores a binary pattern. It is entirely up to you, as the programmer, to decide on how these patterns are to be interpreted. For example, the 8-bit binary pattern "0100 0001B" can be interpreted as an unsigned integer 65, or an ASCII character 'A', or some secret information known only to you. In other words, you have to first decide how to represent a piece of data in a binary pattern before the binary patterns make sense. The interpretation of binary pattern is called data representation or encoding. Furthermore, it is important that the data representation schemes are agreed-upon by all the parties, i.e., industrial standards need to be formulated and straightly followed.

Once you decided on the data representation scheme, certain constraints, in particular, the precision and range will be imposed. Hence, it is important to understand data representation to write correct and high-performance programs.

TYPES OF DATA REPRESENTATION

Computers not only process numbers, letters and special symbols but also complex types of data such as sound and pictures. However, these complex types of data take a lot of memory and processor time when coded in binary form.

This limitation necessitates the need to develop better ways of handling long streams of binary digits.

Higher number systems are used in computing to reduce these streams of binary digits into manageable form. This helps to improve the processing speed and optimize memory usage. Number systems and their representation

A number system is a set of symbols used to represent values derived from a common base or radix.

As far as computers are concerned, number systems can be classified into two major categories:

- decimal number system
- binary number system
- octal number system
- hexadecimal number system

Decimal number system

The term decimal is derived from a Latin prefix deci, which means ten. Decimal number system has ten digits ranging from 0-9. Because this system has ten digits; it is also called a base ten number system or denary number system.

A decimal number should always be written with a subscript 10 e.g. X10

But since this is the most widely used number system in the world, the subscript is usually understood and ignored in written work. However ,when many number systems are considered together, the subscript must always be put so as to differentiate the number systems.

The magnitude of a number can be considered using these parameters.

- Absolute value
- Place value or positional value
- Base value

The ***absolute value*** is the magnitude of a digit in a number. for example the digit 5 in 7458 has an absolute value of 5 according to its value in the number line.

The ***place value*** of a digit in a number refers to the position of the digit in that number i.e. whether; tens, hundreds, thousands etc.

The ***total value*** of a number is the sum of the place value of each digit making the number.

The base value of a number also k known as the radix, depends on the type of the number systems that is being used .The value of any number depends on the radix. for example the number 10010 is not equivalent to 1002.

Binary number system

It uses two digits namely, 1 and 0 to represent numbers. unlike in decimal numbers where the place value goes up in factors of ten, in binary system, the place values increase by the factor of 2.binary numbers are written as X2.consider a binary number such as 10112.The right most digit has a place value of 1×20 while the left most has a place value of 1×23.

Octal number system

Consists of eight digits ranging from 0-7.the place value of octal numbers goes up in factors of eight from right to left.

Hexadecimal number system

This is a base 16 number system that consists of sixteen digits ranging from 0-9 and letters A-F where A is equivalent to 10,B to 11 up to F which is equivalent to 15 in base ten system. The place value of hexadecimal numbers goes up in factors of sixteen.

A hexadecimal number can be denoted using 16 as a subscript or capital letter H to the right of the number .For example, 94B can be written as 94B16 or 94BH.

Further conversion of numbers from one number system to another

To convert numbers from one system to another. the following conversions will be considered.

- ***Converting between binary and decimal numbers.***
- ***Converting octal numbers to decimal and binary form.***
- ***Converting hexadecimal numbers to decimal and binary form.***

Symbolic representation using coding schemes

In computing, a single character such as a letter, a number or a symbol is represented by a group of bits. The number of bits per character depends on the coding scheme used.

The most common coding schemes are:

Binary Coded Decimal (BCD),

Extended Binary Coded Decimal Interchange Code (EBCDIC) and

American Standard Code for Information Interchange (ASCII).

Binary Coded Decimal

Binary Coded Decimal is a 4-bit code used to represent numeric data only. For example, a number like 9 can be represented using Binary Coded Decimal as 10012 .

Binary Coded Decimal is mostly used in simple electronic devices like calculators and microwaves. This is because it makes it easier to process and display individual numbers on their Liquid Crystal Display (LCD) screens.

A standard Binary Coded Decimal, an enhanced format of Binary Coded Decimal, is a 6-bit representation scheme which can represent non-numeric characters. This allows 64 characters to be represented. For letter A can be represented as 1100012 using standard Binary Coded Decimal

Extended Binary Coded Decimal Interchange code (EBCDIC)

Extended Binary Coded Decimal Interchange code (EBCDIC) is an 8-bit character-coding scheme used primarily on IBM computers. A total of 256 (28) characters can be coded using this scheme. For example, the symbolic representation of letter A using Extended Binary Coded Decimal Interchange code is 110000012.

American standard code for information interchange (ASCII)

American standard code for information interchange (ASCII) is a 7-bit code, which means that only 128 characters i.e. 27 can be represented. However, manufactures have added an eight bit to this coding scheme, which can now provide for 256 characters.

This 8-bit coding scheme is referred to as an 8-bit American standard code for information interchange. The symbolic representation of letter A using this scheme is 10000012..

Binary arithmetic operations

In mathematics, the four basic arithmetic operations applied on numbers are addition, subtraction, multiplications and division.

In computers, the same operations are performed inside the central processing unit by the arithmetic and logic unit (ALU). However, the arithmetic and logic unit cannot perform binary subtractions directly. It performs binary subtractions using a process known as For multiplication and division, the arithmetic and logic unit uses a method called shifting before adding the bits.

Representation of signed binary numbers

In computer technology, there are three common ways of representing a signed binary number.

1. Prefixing an extra sign bit to a binary number.

2. Using ones compliment.
3. Using twos compliment.

Prefixing an extra sign bit to a binary number

In decimal numbers, a signed number has a prefix "+" for a positive number e.g. +2710 and "-" for a negative number e.g.-27
However, in binary, a negative number may be represented by prefixing a digit 1 to the number while a positive number may be represented by prefixing a digit 0. For example, the 7-bit binary equivalent of 127 is 11111112. To indicate that it is positive, we add an extra bit (0) to the left of the number i.e. (0)11111112.
To indicate that it is negative number we add an extra bit (1) i.e. (1)11111112.
The problem of using this method is that the zero can be represented in two ways i.e.(0)00000002 and (1)00000002.

Ones compliment

T he term compliment refers to a part which together with another makes up a whole. For example in geometry two complimentary angle (900).
The idea of compliment is used to address the problem of signed numbers i.e. positive and negative.
In decimal numbers (0 to 9), we talk of nine's compliment. For example the nines compliment
Of 9 is 0, that of 5 is 4 while 3 is 6.

However, in binary numbers, the ones compliment is the bitwise NOT applied to the number. Bitwise NOT is a unary operator (operation on only one operand) that performs logical negation on each bit. For example the bitwise NOT of 11002 is 00112e.
0s are negated to 1s while 1s are negated to 0s.

Twos compliment

Twos compliment, equivalent to tens compliment in decimal numbers, is the most popular way of representing negative numbers in computer systems. The advantages of using this method are:
1. There are no two ways of representing a zero as in the case with other two methods.
2. Effective addition and subtraction can be done even with numbers that are represented with a sign bit without a need for circuitries to examine the sign of an operand.

The twos compliment of a number is obtained by getting the ones compliment then adding a 1. For example, to get the twos compliment of a decimal number 4510,
First convert it to its binary equivalent then find its ones compliment. Add a 1 to ones compliment i.e.

PREVIOUS YEARS SOLVED MCQS

1 Using websites to pour out one's grievances is called:
(A) cyber venting
(B) cyber ranting
(C) web hate
(D) web plea
Answer: (A)
The term invented for this is cyber venting: venting your anger by electronic means. Some employers have even set up official grousing sites on internal Web systems, reasoning that it's better to get the complaints out in the open than have problems fester in the dark. The term has also been applied to Web sites set up by people who are angry at the treatment they've received from retailers or suppliers, and also to the mass e-mailing of staff by aggrieved ex-workers, such as in a recent case at Intel.
cyberventing
2. In web search, finding a large number of documents with very little relevant information is termed:
(A) poor recall
(B) web crawl
(C) poor precision rate
(D) poor web response
Answer: (A)
Precision is the fraction of retrieved documents that are relevant to the query:
For example, for a text search on a set of documents, precision is the number of correct results divided by the number of all returned results.
Recall is the fraction of the relevant documents that are successfully retrieved.
For example, for a text search on a set of documents, recall is the number of correct results divided by the number of results that should have been returned.
3. The concept of connect intelligence is derived from:
(A) virtual reality
(B) fuzzy logic
(C) Bluetooth technology
(D) value added networks
Answer: (D)
Connect intelligence: CI involves the coming together and sharing of knowledge amongst a group and secondly, it involves action or goal oriented activity yielding new knowledge as a key contribution to organizations.
4. Use of an ordinary telephone as an Internet appliance is called:
(A) voice net
(B) voice telephone
(C) voice line
(D) voice portal
Answer: (C)
5. Video transmission over the Internet that looks like delayed live casting is called:
(A) virtual video
(B) direct broadcast
(C) video shift
(D) real-time video
Answer: (D)
Real-time video The transmission of live video. It implies that there is no delay at the receiving side, or at most, imperceptible delays. Although a video broadcast that is streamed live may be considered real-time video, there is an intentional, buffered delay at the receiving end. True real-time video capability is required in a two-way video calling or videoconferencing session
6 LAN stands for:
(A) Local And National
(B) Local Area Network
(C) Large Area Network

(D) Live Area Network
Answer: (B)
7. Which of the following statement is correct?
(A) Modem is software
(B) Modem helps in stabilizing the voltage
(C) Modem is the operating system
(D) Modem converts the analog signal into digital signal and vice-versa
Answer: (D)
8. Which of the following is the appropriate definition of a computer?
(A) Computer is a machine that can process information.
(B) Computer is an electronic device that can store, retrieve and process both qualitative and quantitative data quickly and accurately.
(C) Computer is an electronic device that can store, retrieve and quickly process only quantitative data.
(D) Computer is a machine that can store, retrieve and process quickly and accurately only qualitative information
Answer: (B)
9. Information and Communication Technology includes:
(A) On line learning
(B) Learning through the use of EDUSAT
(C) Web Based Learning
(D) All the above
Answer: (D)
10. Which of the following is the appropriate format of URL of e-mail?
(A) www_mail.com
(B) www@mail.com
(C) WWW@mail.com
(D) www.mail.com
Answer: (B)
11. On the keyboard of computer each character has an "ASCII" value which stands for:
(A) American Stock Code for Information Interchange
(B) American Standard Code for Information Interchange
(C) African Standard Code for Information Interchange
(D) Adaptable Standard Code for Information Change
Answer: (B)
12. Which part of the Central Processing Unit (CPU) performs calculation and makes decisions:
(A) Arithematic Logic Unit
(B) Alternating Logic Unit
(C) Alternate Local Unit
(D) American Logic Unit
Answer: (A)
13. "Dpi" stands for:
(A) Dots per inch
(B) Digits per unit
(C) Dots pixel inch
(D) Diagrams per inch
Answer: (A)
14. The process of laying out a document with text, graphics, headlines and photographs is involved in
(A) Deck Top Publishing
(B) Desk Top Printing
(C) Desk Top Publishing
(D) Deck Top Printing
Answer: (C)
15. Transfer of data from one application to another line is known as:
(A) Dynamic Disk Exchange
(B) Dodgy Data Exchange
(C) Dogmatic Data Exchange
(D) Dynamic Data Exchange
Answer: (D)
16. CD ROM stands for:
(A) Computer Disk Read Only Memory
(B) Compact Disk Read over Memory
(C) Compact Disk Read Only Memory
(D) Computer Disk Read over Memory
Answer: (C)
17. The 'brain' of a computer which keeps peripherals under its control is called:
(A) Common Power Unit

(B) Common Processing Unit
(C) Central Power Unit
(D) Central Processing Unit
Answer: (D)
18. Data can be saved on backing storage medium known as :
(A) Compact Disk Recordable
(B) Computer Disk Rewritable
(C) Compact Disk Rewritable
(D) Computer Data Rewritable
Answer: (C)
19. RAM means:
(A) Random Access Memory
(B) Rigid Access Memory
(C) Rapid Access Memory
(D) Revolving Access Memory
Answer: (A)
20. www represents:
(A) who what and where
(B) weird wide web
(C) word wide web
(D) world wide web
Answer: (D)
21. WYSIWYG - describes the display of a document on screen as it will actually print:
(A) What you state is what you get
(B) What you see is what you get
(C) What you save is what you get
(D) What you suggest is what you get
Answer: (B)
22. Which of the following is not a Computer language?
(A) PASCAL
(B) UNIX
(C) FORTRAN
(D COBOL
Answer: (B)
23. A key-board has at least:
(A) 91 keys
(B) 101 keys
(C) 111 keys
(D) 121 keys
Answer: (B)
IBM/PC keyboards
Original IBM PC Keyboard (1981) - 83 keys
Updated IBM PC Keyboard (1984) - 84 keys
AT Keyboard - 84 keys
AT Enhanced Keyboard - 101 keys
US Traditional Keyboard - 101 keys
Enhanced European Keyboard - 102 keys
Windows Keyboard - 104 keys
Windows-based Laptop Keyboard - 86 keys
Apple keyboards
Apple Keyboard with Numeric Keypad - 109 keys
Apple Wireless Keyboard - 78 keys
Apple Mac-book Air laptop - 78 keys
24. An E-mail address is composed of:
(A) Two parts
(B) Three parts
(C) Four parts
(D) Five parts
Answer: (A)
The general format of an email address is local-part@domain, and a specific example is jsmith@example.com. An address consists of two parts.
25. Corel Draw is a popular:
(A) Illustration programme
(B) Programming language
(C) Text programme

(D) None of the above
Answer: (A)
26. The accounting software 'Tally' was developed by:
(A) HCL
(B) TCS
(C) Infosys
(D) Wipro
Answer: (B)
27. Errors in computer programmes are called:
(A) Follies
(B) Mistakes
(C) Bugs
(D) Spam
Answer: (C)
28. HTML is basically used to design:
(A) Web-page
(B) Web-site
(C) Graphics
(D) Tables and Frames
Answer: (A)
HTML can embed programs written in a scripting language such as JavaScript which affect the behavior and content of web pages.
29. 'Micro Processing'is made for:
(A) Computer
(B) Digital System
(C) Calculator
(D) Electronic Goods
Answer: (A)
A microprocessor is an electronic component that is used by a computer to do its work. It is a central processing unit on a single integrated circuit chip containing millions of very small components including transistors, resistors, and diodes that work together. Microprocessors help to do everything from writing to searching the Web. Everything a computer does is described by lots of precise instructions, and microprocessors carry out these instructions at incredible speed—many millions of times a second
30. Information, a combination of graphics, text, sound, video and animation is called:
(A) Multiprogramme
(B) Multifacet
(C) Multimedia
(D) Multiprocess
Answer: (C)
31. What do you need to put your web pages on the www?
(A) a connection to internet
(B) a web browser
(C) a web server
(D) all of the above
Answer: (D)
32. Which was the first company to launch mobile phone services in India?
(A) Essar
(B) BPL
(C) Hutchison
(D) Airtel
Answer: (B)
33. Chandrayan I was launched on 22nd October, 2008 in India from:
(A) Bangalore
(B) Sri Harikota
(C) Chennai
(D) Ahmedabad
Answer: (B)
Chandrayaan-1, India's first mission to Moon, waslaunched successfully on October 22, 2008 from SDSC SHAR, Sriharikota. The spacecraft was orbiting around the Moon at a height of 100 km from the lunar surface for chemical, mineralogical and photo-geologic mapping of the Moon.
34. What is blog?
(A) Online music
(B) Intranet
(C) A personal or corporate website in the form of an online journal
(D) A personal or corporate Google search
Answer: (C)

39. Which is not online Indian Matrimonial website?
(A) www.jeevansathi.com
(B) www.bharatmatrimony.com
(C) www.shaadi.com
(D) www.u.k.singlemuslim.com
Answer: (D)
40. Which of the following is not related to information security on the Internet?
(A) Data Encryption
(B) Water marking
(C) Data Hiding
(D) Information Retrieval
Answer: (D)
41. Which is the largest unit of storage among the following?
(A) Terabyte
(B) Megabyte
(C) Kilobyte
(D) Gigabyte
Answer: (A)
42. bit stands for
(A) binary information term
(B) binary digit
(C) binary tree
(D) Bivariate Theory
Answer: (B)
A bit (short for binary digit) is the smallest unit of data in a computer. A bit has a single binary value, either 0 or 1. Although computers usually provide instructions that can test and manipulate bits, they generally are designed to store data and execute instructions in bit multiples called bytes.
43. Which one of the following is not a linear data structure?
(A) Array
(B) Binary Tree
(C) Queue
(D) Stack
Answer: (B)
44. Which one of the following is not a network device?
(A) Router
(B) Switch
(C) Hub
(D) CPU
Answer: (D)
45. A compiler is used to convert the following to object code which can be executed
(A) High-level language
(B) Low-level language
(C) Assembly language
(D) Natural language
Answer: (A)
A compiler is a software program that transforms high-level source code that is written by a developer in a high-level programming language into a low level object code (binary code) in machine language, which can be understood by the processor. The process of converting high-level programming into machine language is known as compilation.
46. Which number system is usually followed in a typical 32-bit computer?
(A) 2
(B) 8
(C) 10
(D) 16
Answer: (B)
47. Which one of the following is an example of Operating System?
(A) Microsoft Word
(B) Microsoft Excel
(C) Microsoft Access
(D) Microsoft Windows
Answer: (D)
48. Which one of the following represents the binary equivalent of the decimal number 23?
(A) 01011
(B) 10111
(C) 10011
(D) None of the above

Answer: (B)
49. Which one of the following is different from other members?
(A) Google
(B) Windows
(C) Linux
(D) Mac
Answer: (A)
50. Where does a computer add and compare its data?
(A) CPU
(B) Memory
(C) Hard disk
(D) Floppy disk
Answer: (A)
51. Computers on an internet are identified by
(A) e-mail address
(B) street address
(C) IP address
(D) None of the above
Answer: (C)
52. Which one of the following is not an Internet Service Provider (ISP)?
(A) MTNL
(B) BSNL
(C) ERNET India
(D) Infotech India Ltd.
Answer: (D)
53. The hexadecimal number system consists of the symbols
(A) 0 – 7
(B) 0 – 9 , A – F
(C) 0 – 7, A – F
(D) None of these
Answer: (B)
54. The binary equivalent of (–15)10 is (2's complement system is used)
(A) 11110001
(B) 11110000
(C) 10001111
(D) None of these
Answer: (A)
55. 1 GB is equal to
(A) 230 bits
(B) 230 bytes
(C) 220 bits
(D) 220 bytes
Answer: (B)
56. The set of computer programs that manage the hardware/software of a computer is called
(A) Compiler system
(B) Operation system
(C) Operating system
(D) None of these
Answer: (C)
57. S/MIME in Internet technology stands for
(A) Secure Multipurpose Internet Mail Extension
(B) Secure Multimedia Internet Mail Extension
(C) Simple Multipurpose Internet Mail Extension
(D) Simple Multimedia Internet Mail Extension
Answer: (A)
58. The octal number system consists of the following symbols :
(A) 0 – 7
(B) 0 – 9
(C) 0 – 9, A – F
(D) None of the above
Answer: (A)
59. The binary equivalent of (–19)10 in signed magnitude system is
(A) 11101100
(B) 11101101
(C) 10010011

(D) None of these
Answer: (B) 11101101
60. DNS in internet technology stands for
(A) Dynamic Name System
(B) Domain Name System
(C) Distributed Name System
(D) None of these
Answer: (B)
61. HTML stands for
(A) Hyper Text Markup Language
(B) Hyper Text Manipulation Language
(C) Hyper Text Managing Links
(D) Hyper Text Manipulating Links
Answer: (A)
62. Which of the following is type of LAN?
(A) Ethernet
(B) Token Ring
(C) FDDI
(D) All of the above
Answer: (D)
63. Which of the following statements is true ?
(A) Smart cards do not require an operating system.
(B) Smart cards and PCs use some operating system.
(C) COS is smart card operating system.
(D) The communication between reader and card is in full duplex mode.
Answer: (B)
64. Which of the following operating system is used on mobile phones?
(A) Windows Vista
(B) Android
(C) Windows XP
(D) All of the above
Answer: (B)
65. If (y)x represents a number y in base x, then which of the following numbers is smallest of all ?
(A) (1111)2
(B) (1111)8
(C) (1111)10
(D) (1111)16
Answer: (A)
66. High level programming language can be converted to machine language using which of the following?
(A) Oracle
(B) Compiler
(C) Mat lab
(D) Assembler
Answer: (B)
67. HTML is used to create
(A) machine language program
(B) high level program
(C) web page
(D) web server
Answer: (C)
68. The term DNS stands for
(A) Domain Name System
(B) Defense Nuclear System
(C) Downloadable New Software
(D) Dependent Name Server
Answer: (A)
69. IPv4 and IPv6 are addresses used to identify computers on the internet.
Find the correct statement out of the following:
(A) Number of bits required for IPv4 address is more than number of bits required for IPv6 address.
(B) Number of bits required for IPv4 address is same as number of bits required for IPv6 address.
(C) Number of bits required for IPv4 address is less than number of bits required for IPv6 address.
(D) Number of bits required for IPv4 address is 64.
Answer: (C)
IPv4 Vs IPv6

A new technology will take its place, though. IPv4's successor is IPv6, a system that will not only offer far more numerical addresses, but will simplify address assignments and additional network security features.

The transition from IPv4 to IPv6 is likely to be rough, though. Most people are unfamiliar with IPv4 and IPv6, much less the potential impact the switch to IPv6 may have on their lives.

That's why we've compiled this short guide to IPv4 and the eventual transition to IPv6. We explain the two versions of IP and why they matter. We also go into detail on what you can expect in the next few years as billions of websites, businesses and individuals make the switch to the new era of the Internet.

IPv4 & IPv6 Q&A

Q: What is IPv4?

A: IPv4 stands for Internet Protocol version 4. It is the underlying technology that makes it possible for us to connect our devices to the web. Whenever a device access the Internet (whether it's a PC, Mac, smartphone or other device), it is assigned a unique, numerical IP address such as 99.48.227.227. To send data from one computer to another through the web, a data packet must be transferred across the network containing the IP addresses of both devices.

Without IP addresses, computers would not be able to communicate and send data to each other. It's essential to the infrastructure of the web.

Q: What is IPv6?

A: IPv6 is the sixth revision to the Internet Protocol and the successor to IPv4. It functions similarly to IPv4 in that it provides the unique, numerical IP addresses necessary for Internet-enabled devices to communicate. However, it does sport one major difference: it utilizes 128-bit addresses. I'll explain why this is important in a moment.

Q: Why are we running out of IPv4 addresses?

A: IPv4 uses 32 bits for its Internet addresses. That means it can support 2^32 IP addresses in total — around 4.29 billion. That may seem like a lot, but all 4.29 billion IP addresses have now been assigned to various institutions, leading to the crisis we face today.

Let's be clear, though: we haven't run out of addresses quite yet. Many of them are unused and in the hands of institutions like MIT and companies like Ford and IBM. More IPv4 addresses are available to be assigned and more will be traded or sold (since IPv4 addresses are now a scarce resource), but they will become a scarcer commodity over the next two years until it creates problem for the web.

Q: How does IPv6 solve this problem?

A: As previously stated, IPv6 utilizes 128-bit Internet addresses. Therefore, it can support 2^128 Internet addresses — 340,282,366,920,938,000,000,000,000,000,000,000,000 of them to be exact. That's a lot of addresses, so many that it requires a hexadecimal system to display the addresses. In other words, there are more than enough IPv6 addresses to keep the Internet operational for a very, very long time.

Q: So why don't we just switch?

A: The depletion of IPv4 addresses was predicted years ago, so the switch has been in progress for the last decade. However, progress has been slow — only a small fraction of the web has switched over to the new protocol. In addition, IPv4 and IPv6 essentially run as parallel networks — exchanging data between these protocols requires special gateways.

To make the switch, software and routers will have to be changed to support the more advanced network. This will take time and money. The first real test of the IPv6 network will come on June 8, 2011, World IPv6 Day. Google, Facebook and other prominent web companies will test drive the IPv6 network to see what it can handle and what still needs to be done to get the world switched over to the new network.

70. TCP/IP is necessary if one is to connect to the

(A) Phone lines
(B) LAN
(C) Internet
(D) a Server

Answer: (C)

71. Each character on the keyboard of computer has an ASCII value which stands for

(A) American Stock Code for Information Interchange
(B) American Standard Code for Information Interchange
(C) African Standard Code for Information Interchange
(D) Adaptable Standard Code for Information Change

Answer: (B)

72. Which of the following is not a programming language ?

(A) Pascal
(B) Microsoft Office
(C) Java
(D) C++

Answer: (B)

73. Minimum number of bits required to store any 3 digit decimal number is equal to

(A) 3
(B) 5
(C) 8
(D) 10

Answer: (D)

Notes:

Assuming that the question is asking what are the minimum bits required for you to store
3 digits number
My approach to this question would be:
What's the maximum number of 3 digits number we need to store? **Ans: 999**
What's the minimum amount of bits required for me to store this number?
This problem can be solved this way by dividing 999 by 2 recursively. However, it's simpler to use the power of moths to help us. Essentially, we're solving n for the equation below:
2^n = 999
nlog2 = log999
n ~ 10
You'll need 10 bits to store 3 digit numbers.
Use similar approach to solve the other sub questions!
The formula for the number of binary bits required for a positive integer n is:
loge(n) / loge(2)
and round up.
On your calculator, loge may just be labelled log or ln (natural logarithm).
The largest number that can be represented by an n digit number in base b is bn - 1. Hence, ***the largest number that can be represented in N binary digits is 2N - 1.*** We need the smallest integer N such that:
2N - 1 ≥ bn - 1
⇒ 2N ≥ bn
Taking the base 2 logarithm of both sides of the last expression gives:
log2 2N ≥ log2 bn
⇒ N ≥ log2 bn
⇒ N ≥ log bn / log 2
Since we want the smallest integer N that satisfies the last relation, to find N, find log bn / log2 and take the ceiling.
For n = 3:
N = ⌈$\log_{10}$3 / log 2⌉ = 10
For n = 4:
N = ⌈$\log_{10}$4 / log 2⌉ = 14
For n = 6:
N = ⌈log 106 / log 2⌉ = 20
And in general, for n decimal digits:
N = ⌈log 10n / log 2⌉

74. Internet explorer is a type of
(A) Operating System
(B) Compiler
(C) Browser
(D) IP address
Answer: (C)

75. POP3 and IMAP are e-mail accounts in which
(A) One automatically gets one's mail everyday
(B) One has to be connected to the server to read or write one's mail
(C) One only has to be connected to the server to send and receive email
(D) One does not need any telephone lines
Answer: (C)

76. ALU stands for
(A) American Logic Unit
(B) Alternate Local Unit
(C) Alternating Logic Unit
(D) Arithmetic Logic Unit
Answer: (D)

77. A Personal Computer uses a number of chips mounted on a circuit board called
(A) Microprocessor
(B) System Board
(C) Daughter Board
(D) Mother Board
Answer: (D)

78. Computer Virus is a
(A) Hardware
(B) Bacteria
(C) Software
(D) None of these
Answer: (C)

79. Which one of the following is correct?
(A) (17)10 = (17)16

(B) (17)10 = (17)8
(C) (17)10 = (10111)2
(D) (17)10 = (10001)2
Answer: (D)
80. The file extension of MS-Word document in Office 2007 is _____.
(A) .pdf
(B) .doc
(C) .docx
(D) .txt
Answer: (C)
81. _____ is a protocol used by e-mail clients to download e-mails to your computer.
(A) TCP
(B) FTP
(C) SMTP
(D) POP
Answer: (D)
TCP (Transmission Control Protocol) is a standard that defines how to establish and maintain a network conversation via which application programs can exchange data. TCP works with the Internet Protocol (IP), which defines how computers send packets of data to each other. Together, TCP and IP are the basic rules defining the Internet. TCP is defined by the Internet Engineering Task Force (IETF) in the Request for Comment (RFC) standards document number 793.
TCP is a connection-oriented protocol, which means a connection is established and maintained until the application programs at each end have finished exchanging messages. It determines how to break application data into packets that networks can deliver, sends packets to and accepts packets from the network layer, manages flow control, and—because it is meant to provide error-free data transmission—handles retransmission of dropped or garbled packets as well as acknowledgement of all packets that arrive. In the Open Systems Interconnection (OSI) communication model, TCP covers parts of Layer 4, the Transport Layer, and parts of Layer 5, the Session Layer.
For example, when a Web server sends an HTML file to a client, it uses the HTTP protocol to do so. The HTTP program layer asks the TCP layer to set up the connection and send the file. The TCP stack divides the file into packets, numbers them and then forwards them individually to the IP layer for delivery. Although each packet in the transmission will have the same source and destination IP addresses, packets may be sent along multiple routes. The TCP program layer in the client computer waits until all of the packets have arrived, then acknowledges those it receives and asks for the retransmission on any it does not (based on missing packet numbers), then assembles them into a file and delivers the file to the receiving application.
Definition - What does Post Office Protocol (POP) mean?
Post Office Protocol (POP) is a type of computer networking and Internet standard protocol that extracts and retrieves email from a remote mail server for access by the host machine.
POP is an application layer protocol in the OSI model that provides end users the ability to fetch and receive email.
82. 'www' stands for
(A) work with web
(B) world wide web
(C) world wide web
(D) worthwhile web
Answer: (C)
83. A hard disk is divided into tracks which is further subdivided into
(A) Clusters
(B) Sectors
(C) Vectors
(D) Heads
Answer: (B)
84. A computer program that translates a program statement by statement into machine languages is called a/an
(A) Compiler
(B) Simulator
(C) Translator
(D) Interpreter
Answer: (D)
Compiler, Assembler, Interpreter Notes:
Compiler scans the entire program once and then converts it into machine language which can then be executed by computer's processor. In short compiler translates the entire program in one go and then executes it. Interpreter on the other hand first converts high level language into an intermediate code and then executes it line by line. This intermediate code is executed by another program.
The execution of program is faster in compiler than interpreter as in interpreter code is executed line by line.
Compiler generates error report after translation of entire code whereas in case of interpreter once an error is encountered it is notified and no further code is scanned.
Assembler is used for converting the code of low level language (assembly language) into machine level language.If you have worked on microprocessors like 8085 and 8086 the module which converts assembly language into machine language is nothing but Assembler.

We generally write a computer program using a high-level language. A high-level language is one which is understandable by us humans. It contains words and phrases from the English (or other) language. But a computer does not understand high-level language. It only understands program written in 0's and 1's in binary, called the machine code. A program written in high-level language is called a source code. We need to convert the source code into machine code and this is accomplished by compilers and interpreters. Hence, a compiler or an interpreter is a program that converts program written in high-level language into machine code understood by the computer.

The difference between an interpreter and a compiler is given below:

Interpreter	Compiler
Translates program one statement at a time	Scans the entire program and translates it as a whole into machine code.
It takes less amount of time to analyze the source code but the overall execution time is slower.	It takes large amount of time to analyze the source code but the overall execution time is comparatively faster.
No intermediate object code is generated, hence are memory efficient.	Generates intermediate object code which further requires linking, hence requires more memory.
Continues translating the program until the first error is met, in which case it stops. Hence debugging is easy.	It generates the error message only after scanning the whole program. Hence debugging is comparatively hard.
Programming language like Python, Ruby use interpreters.	Programming language like C, C++ use compilers.

85. A Gigabyte is equal to
(A) 1024 Megabytes
(B) 1024 Kilobytes
(C) 1024 Terabytes
(D) 1024 Bytes
Answer: (A)

86. A Compiler is software which converts
(A) characters to bits
(B) high level language to machine language
(C) machine language to high level language
(D) words to bits
Answer: (B)

87. Virtual memory is
(A) an extremely large main memory.
(B) an extremely large secondary memory.
(C) an illusion of extremely large main memory.
(D) a type of memory used in super computers.
Answer: (C)

88. The Internet ethical protocol is called
(A) net protocol
(B) netiquette
(C) net ethics
(D) net morality
Answer: (B)

Netiquette is etiquette on the Internet. Since the Internet changes rapidly, its netiquette does too, but it's still usually based on the Golden Rule. The need for a sense of netiquette arises mostly when sending or distributing e-mail, posting on Usenet groups, or chatting. To some extent, the practice of netiquette depends on understanding how e-mail, the Usenet, chatting, or other aspects of the Internet actually work or are practiced. So a little preliminary observation can help. Poor netiquette because you're new is one thing, but such practices as spam and flaming are another matter.

89. Commercial messages on the net are identified as
(A) Net ads
(B) Internet commercials
(C) Webmercials
(D) Viral advertisements
Answer: (C) Webmercials are Online Video Advertising for businesses big and small.

90. Manuel Castelle was the first to use the term
(A) Internet society
(B) Electronic society
(C) Network society
(D) Telematic society
Answer: (C)

91. GIF stands for
(A) Global Information Format
(B) Graphics Information Format

(C) Graphics Interchange File
(D) Graphics Interchange Format
Answer: (D)
92. Which one of the following is not an Operating System ?
(A) IBM AIX
(B) Linux
(C) Sun Solaris
(D) Firefox
Answer: (D)
93. Which of the following is a social network?
(A) amazon.com
(B) eBay
(C) gmail.com
(D) Twitter
Answer: (D)

Here's how Wikipedia defines social networking: "A social network service focuses on building online communities of people who share interests and/or activities, or who are interested in exploring the interests and activities of others. Most social network services are Web based and provide a variety of ways for users to interact, such as e-mail and instant messaging services."

There are many social networking sites on the Web. FlickR is a photo-sharing site; Yammer asks people to explain "What are you working on?" and only reveals the answers to those in your network with a similar corporate e-mail address; and LinkedIn is a social networking site where professionals can connect. Some of the most popular social networking sites that real estate pros are using include Facebook, MySpace, LinkedIn, YouTube, and Twitter.

Facebook is social. Twitter is social. Discussion and message boards are social. But more people would say that email is not.

Gartner makes two important distinctions as to why email isn't social media:

E-mail is a distribution mechanism and social media is a collective mechanism

Mass communication is different from mass collaboration

Email isn't social media. In fact it's a communications tool that users shouldn't employ for media consumption at all. However by some accounts email marketing is a $10 billion industry – not that size makes right.

During the Internet's Democratization Era, my former Forrester colleague Charlene Li guided companies to a simple and powerful distinction when thinking about tools: email is to-do, RSS is to know. Users approach their inboxes with an obligation mindset, which is fine. They just need to keep in mind that oftentimes the problems they create are their own.

Making email work requires that internally, companies train their users on how to make use of an expanded communications toolkit. Externally, email integrates with social media, orchestrated for reach and frequency.

94. The acronym FTP stands for
(A) File Transfer Protocol
(B) Fast Transfer Protocol
(C) File Tracking Protocol
(D) File Transfer Procedure
Answer: (A)
95. Which one of the following is not a/an image/graphic file format?
(A) PNG
(B) GIF
(C) BMP
(D) GUI
Answer: (D)

GUI implies graphical user interface which is used by windows to make it user friendly while dos uses command line interface. Png, bmp and gif are all image formats.

96. The first Web Browser is
(A) Internet Explorer
(B) Netscape
(C) World Wide Web
(D) Firefox
Answer: (C)

The first web browser was invented in 1990 by Sir Tim Berners-Lee. Berners-Lee is the director of the World Wide Web Consortium (W3C), which oversees the Web's continued development, and is also the founder of the World Wide Web Foundation. His browser was called Worldwide Web and later renamed Nexus.

100. When a computer is booting, BIOS is loaded to the memory by
(A) RAM
(B) ROM
(C) CD-ROM
(D) TCP
Answer: (B)

At initial power on, the BIOS is executed directly from ROM. The ROM chip is mapped to a fixed location in the processor's memory space (this is typically a feature of the chipset). When the x86 processor comes out of reset, it immediately begins executing from 0xFFFFFFF0.

However, executing directly from ROM is quite slow, so usually one of the first things the BIOS does is to copy and decompress the BIOS code into RAM, and it executes from there. Of course, the memory controller must be initialized first! The BIOS takes care of that beforehand.

The memory map layout will vary from system to system. At power-on, the BIOS will query the attached PCI/PCIe devices, determine what resources are needed, and place them in the memory map at the optimal location. If everything is working properly, memory-mapped devices should not overlap with RAM. (Note that on a 64-bit system with >3GB of RAM, things get complicated because you need a "hole" in the middle of RAM for your 32-bit PCI/PCIe devices. Some early x64 BIOSes and chipsets had issues with this.)

101. Which one of the following is not the same as the other three?

(A) MAC address
(B) Hardware address
(C) Physical address
(D) IP address

Answer: (D)

MAC address, hardware address and physical address are all the real address that is assigned to any machine and all of them are unique in themselves. While IP address is the internet protocol address that is assigned to the systems in a network

102. Identify the IP address from the following

(A) 300 .215.317.3
(B) 302.215@417.5
(C) 202.50.20.148
(D) 202-50-20-148

Answer: (C)

"IP" stands for Internet Protocol, so an IP address is an Internet Protocol address. What does that mean? An Internet Protocol is a set of rules that govern Internet activity and facilitate completion of a variety of actions on the World Wide Web. Therefore an Internet Protocol address is part of the systematically laid out interconnected grid that governs online communication by identifying both initiating devices and various Internet destinations, thereby making two-way communication possible.

An IPv4 address consists of four numbers, each of which contains one to three digits, with a single dot (.) separating each number or set of digits. Each of the four numbers can range from 0 to 255. Here's an example of what an IP address might look like: 78.125.0.209. This innocuous-looking group of four numbers is the key that empowers you and me to send and retrieve data over our Internet connections, ensuring that our messages, as well as our requests for data and the data we've requested, will reach their correct Internet destinations. Without this numeric protocol, sending and receiving data over the World Wide Web would be impossible.

An IPv6 address consists of eight groups of four hexadecimal digits. If a group consists of four zeros, the notation can be shortened using a colon to replace the zeros.

Dynamic or Static

IP addresses can be either static or dynamic. Static IP addresses never change. They serve as a permanent Internet address and provide a simple and reliable way for remote computers to contact you. Static IP addresses reveal such information as the continent, country, region, and city in which a computer is located; the ISP (Internet Service Provider) that services that particular computer; and such technical information as the precise latitude and longitude of the country, as well as the locale, of the computer. Many websites provide IP address look-up services to their visitors, free of charge. If you're curious about your own IP address, you can locate these websites by performing a Google search.

Dynamic IP addresses are temporary and are assigned (via DHCP) each time a computer joins a network. They are, in effect, borrowed from a pool of IP addresses that are shared among various computers. Since a limited number of static IP addresses are available, many ISPs reserve a portion of their assigned addresses for sharing among their subscribers in this way. This lowers costs and allows them to service far more subscribers than they otherwise could.

Static IP addresses are generally preferable for such uses as VOIP(Voice over Internet Protocol), online gaming, or any other purpose where users need to make it easy for other computers to locate and connect to them. Easy access can also be facilitated when using a dynamic IP address through the use of a dynamic DNS service, which enables other computers to find you even though you may be using a temporary, one-time IP address. This often entails an extra charge, however, so check with your ISP.

Static IP addresses are considered somewhat less secure than dynamic IP addresses, since they are easier to track for data mining purposes. However, following safe Internet practices can help mitigate this potential problem and keep your computer secure no matter what type of IP address you use.

103. CSS stands for

(A) Cascading Style Sheets
(B) Collecting Style Sheets
(C) Comparative Style Sheets
(D) Comprehensive Style Sheets

Answer: (A)

CSS stands for Cascading Style Sheet and is used by web pages to help keep information in the proper display format. CSS files can help define font, size, color, spacing, border and location of HTML information on a web page, and can also be used to create a continuous look throughout multiple pages of a website.

104. MOOC stands for
(A) Media Online Open Course
(B) Massachusetts Open Online Course
(C) Massive Open Online Course
(D) Myrind Open Online Course
Answer: (C)
105. Binary equivalent of decimal number 35 is
(A) 100011
(B) 110001
(C) 110101
(D) 101011
Answer: (A)
106. gif, jpg, bmp, png are used as extensions for files which store
(A) Audio data
(B) Image data
(C) Video data
(D) Text data
Answer: (B)
107. Symbols A-F are used in which one of the following?
(A) Binary number system
(B) Decimal number system
(C) Hexadecimal number system
(D) Octal number system
Answer: (C)
108. Which one of the following is not a search engine?
(A) Google
(B) Chrome
(C) Yahoo
(D) Bing
Answer: (B)
109 Which of the following represents one billion characters?
(A) Terabyte (B) Kilobyte
(C) Megabyte (D) Gigabyte
Answer: D
Notes
One million=1,000,000
One billion=1,000,000,000=10003
1 byte may hold 1 character
1000 bytes=1 kilobyte
10002 bytes=1 megabyte
10003 bytes=1 gigabyte
110 Which one of the following represents the binary equivalent of the decimal number 25?
(A) 11011 (B) 10101
(C) 01101 (D) 11001
Answer: D
111 Encoding or scrambling data for transmission across a network is known as:
(A) Decryption (B) Protection
(C) Detection (D) Encryption
Answer: D
112 Which of the following is not an output device?
(A) Keyboard (B) Printer
(C) Speaker (D) Monitor
Answer: A
113 Which of the following is not open source software?
(A) Apache HTTP server (B) Internet explorer
(C) Fedora Linux (D) Open office
Answer: B
The term "open source" refers to something people can modify and share because its design is publicly accessible. Open-source software (OSS) is computer software with its source code made available with a license in which the copyright holder provides the rights to study, change, and distribute the software to anyone and for any purpose. Open-source software may be developed in a collaborative public manner. According to scientists who studied it, open-source software is a prominent example of open collaboration. The term is often written without a hyphen as "open source software".
Open-source software development, or collaborative development from multiple independent sources, generates an increasingly more diverse scope of design perspective than any one company is capable of developing and sustaining long term. A 2008 report

by the Standish Group states that adoption of open-source software models has resulted in savings of about $60 billion (£48 billion) per year to consumers

Some examples of Open Source Software

Accounting:

SQL-Ledger (accounting system)

Anti-virus:

ClamAV

Databases:

LDAP

MySQL (database)

PostgreSQL (relational database with ability to do stored procedures)

Knowledge Management:

Plone (open source content management system)

Knowledge Tree

Domain Name Servers:

Bind

PowerDNS

Telephony:

Asterisk (A Phone system [PBX] that also supports Voice Over IP technology)

Elastix

FreePBX

Trixbox CE

E-mail Servers:

PostFix

QMail

Sendmail

File Servers:

FreeNAS

OpenFiler

Samba

Medical Software:

http://www.oemr.org

http://en.wikipedia.org/wiki/List_of_open_source_healthcare_software

Other Valuable Systems (servers & desktops):

Apache (web server)

CentOS (Linux distribution from Red Hat's development efforts)

Fedora (Linux destop system)

JBoss (J2EE server for Enterprise Java Development)

Slackware (Linux distribution)

Tomcat (Java servlet container)

Ubuntu (a Linux desktop operating system)

Zope (Content management system and portal)

Productivity Software:

Evolution (calendar, contact manager and e-mail client)

Firefox (web browser)

Gimp (image manipulation program)

Open Office (word processor, spreadsheet, etc.)

Thunderbird (e-mail client, news aggregator, etc.)

Programming Languages:

C, C++, Mono, PHP, Python, Perl, Ruby, TcL

Spam Filtering:

AmavisD

PostGrey

SpamAssign

Routing/Networking:

DHCPD

IPTables

PF Sense

Virtualization:

KVM

Xen

This is strictly a small example of some open source software. This is a brief list of a few products which are open sourced to the world and is by no means: a complete list

114 Which of the following is an instant messaging application?

(a) WhatsApp

(b) Google Talk
(c) Viber
Select the correct answer from the codes given below:
(A) (a) and (b) only (B) (b) and (c) only
(C) (a) only (D) (a), (b) and (c)
Answer: D
115. In a Computer a byte generally consists of:
(A) 4 bits (B) 8 bits
(C) 16 bits (D) 10 bits
Answer: B
116. Which of the following is not an input device?
(A) Microphone (B) Keyboard
(C) Joystick (D) Monitor
Answer: D
117. Which of the following is an open source software?
(A) MS Word (B) Windows
(C) Mozilla Firefox (D) Acrobat Reader
Answer: C
Mozilla Firefox (or simply Firefox) is a free and open-source web browser developed by the Mozilla Foundation and its subsidiary the Mozilla Corporation. Firefox is available for Windows, macOS and Linux operating systems, with its Firefox for Android available for Android (formerly Firefox for mobile, it also ran on the discontinued Firefox OS), and uses the Gecko layout engine to render web pages, which implements current and anticipated web standards.
118. Which of the following enables us to send the same letter to different persons in MS Word?
(A) Mail join (B) Mail copy
(C) Mail insert (D) Mail merge
Answer: D
119. The statement "the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer Hardware" refers to
(1) Information Technology (IT)
(2) Information and Collaborative Technology (ICT)
(3) Information and Data Technology (IDT)
(4) Artificial Intelligence (AI)
Answer: 1
120. the binary equivalent of the decimal number 48 is 110000, then the binary equivalent of the decimal number 51 is given by
(1) 110011
(2) 110010
(3) 110001
(4) 110100
Answer: 1
121. Process of copying files to a CD-ROM is known as
(1) Burning
(2) Zipping
(3) Digitizing
(4) Ripping
Answer: 1
122 An unsolicited e-mail message sent to many recipients at once is a
(1) Worm
(2) Virus
(3) Threat
(4) Spam
Answer: 4
123 _____ is a type of memory circuitry that holds the computer's start-up routine.
(1) RIM (Read Initial Memory)
(2) RAM (Random Access Memory)
(3) ROM (Read Only Memory)
(4) Cache Memory
Answer: 3
124 An ASCII is a character-encoding scheme that is employed by personal computers in order to represent various characters, numbers and control keys that the computer user selects on the keyboard. ASCII is an acronym for
(1) American Standard Code for Information Interchange
(2) American Standard Code for Intelligent Information
(3) American Standard Code for Information Integrity
(4) American Standard Code for Isolated Information
Answer: 1

125. Which of the following statements regarding the features of Information and Communication Technology (ICT) is/are true?

I. ICT is the main instruments for the creation of computer networks and the applications based on them.
II. ICT supports the spread of information and knowledge, separating the content from the place where it belongs physically.
III. The digital and virtual nature of most of ICT products allow the expenditure for them to be maximized.

Codes: (1) I and II only
(2) I and III only
(3) II and III only
(4) I, II and III

Answer: 1

126. If one GigaByte is equal to 2^{30} Bytes of data storage, then 1024 TeraBytes is equal to _____ bits of data storage.

(1) 2^{50} (2) 2^{53} (3) 2^{40} (4) 2^{56}

Answer 1

127 The software used to navigate through the web is known as

(1) Website
(2) Web Browser
(3) Internet
(4) World Wide Web 38.

Answer: 2

A web browser is a software application for retrieving, presenting and traversing information resources on the World Wide Web. An information resource is identified by a Uniform Resource Identifier (URI) and may be a web page, image, video, or other piece of content. Hyperlinks present in resources enable users easily to navigate their browsers to related resources. A web browser can also be defined as an application software or program designed to enable users to access, retrieve and view documents and other resources on the Internet.

128 With regard to e-mail, what does Bcc : mean ?

(1) Blind Computer Communication: - The users specified in the Bcc : field will get the e-mail and see the addresses in the to : and cc : fields.
(2) Blind Carbon Copy: - The users specified in the Bcc : field will get the e-mail and see the addresses in the to : and cc : fields.
(3) Blind Computer Communication: - The users specified in the Bcc : field will get the e-mail but it will be an audio file because this is how blind people get e-mail.
(4) Blind Carbon Copy : The users specified in the Bcc : field will get the e-mail but will not see the addresses in the to : and cc : fields.

Answer 2

CC vs. BCC

When you CC people on an email, the CC list is visible to all other recipients. For example, if you CC bob@example.com and jake@example.com on an email, Bob and Jake will both know that the other received the email, as well.

BCC stands for "blind carbon copy." Unlike with CC, no one but the sender can see the list of BCC recipients. For example, if you have bob@example.com and jake@example.com in the BCC list, neither Bob nor Jake will know that the other received the email.

Someone on the BCC list can see everything else, including the CC list and the contents of the email. However, the BCC list is secret—no one can see this list except the sender. If a person is on the BCC list, they'll see only their own email on the BCC list.

For example, let's say your boss wants you to email a customer in response to a complaint. You'd put the customer's email address in the To field and your boss's email address in the CC field, so your boss would receive a copy of the email. If you didn't want the customer to see your boss's email address, you'd put your boss's address in the BCC field instead.

129. Random Access Memory (RAM), a form of computer storage, is a _____ memory.

(1) Non-volatile
(2) Volatile
(3) Permanent
(4) Secondary

Answer: 2

Read-only memory, or ROM, is a form of data storage in computers and other electronic devices that can not be easily altered or reprogrammed. RAM is referred to as volatile memory and is lost when the power is turned off whereas ROM in non-volatile and the contents are retained even after the power is switched off.

Random-access memory, or RAM, is a form of data storage that can be accessed randomly at any time, in any order and from any physical location in contrast to other storage devices, such as hard drives, where the physical location of the data determines the time taken to retrieve it. RAM is measured in megabytes and the speed is measured in nanoseconds and RAM chips can read data faster than ROM.

Comparison chart

RAM versus ROM comparison chart

Basis	RAM	ROM
Definition	Random Access Memory or RAM is a form of data storage that can be accessed randomly at any time, in any order and from any physical location. Allowing quick access and manipulation.	Read-only memory or ROM is also a form of data storage that cannot be easily altered or reprogrammed. Stores instructions that are not necessary for re-booting up to make the computer operate when it is switched

		off. They are hardwired.
Stand For	Random Access Memory	Read-only memory
Use	RAM allows the computer to read data quickly to run applications. It allows reading and writing.	ROM stores the program required to initially boot the computer. It only allows reading.
Volatility	RAM is volatile i.e. its contents are lost when the device is powered off.	It is non-volatile i.e. its contents are retained even when the device is powered off.
Types	The two main types of RAM are static RAM and dynamic RAM.	The types of ROM include PROM, EPROM and EEPROM.
Difference in Use	RAM allows the computer to read data quickly and efficiently to be able to run applications efficiently, RAM is a common type of memory found in computers and printers, and can go up to a few gigabytes. RAM is primary memory and volatile	Whereas ROM stores the program required to initially boot the computer and perform diagnostics. ROM is usually only a few thousand bytes of storage in personal computers. Different

Types of RAM vs ROM

ROMs are integrated circuits that contain data and most often cannot be altered. There are some types that can be somewhat modified that include programmable ROM (PROM), erasable programmable ROM (EPROM), electrically erasable programmable ROM (EEPROM) and Flash, which is a type of EEPROM. PROM is a type of ROM that can be programmed only once by a special device and uses high voltages. EPROM can be rewritten using UV radiation, whereas EEPROM can be rewritten electrically and such devices do not require to be removed from the computer. Flash drives are modern version of EEPROM and fastest to erase and rewrite. Some other common types of ROM are CD-ROM, CD-R and CD-RW which is used to store media and music files.The main types of RAM include static RAM (SRAM), dynamic RAM (DRAM). Static RAM is more expensive and has more capacity for storage than dynamic RAM that has to be refreshed more often, and is thus slower.

130. Read the following two statements:

I : Information and Communication Technology (ICT) is considered a subset of Information Technology (IT).

II : The 'right to use' a piece of software is termed as copyright.

Which of the above statement(s) is/are CORRECT?

(1) Both I and II

(2) Neither I nor II

(3) II only

(4) I only

Notes: Information technology (IT) is the application of computers to store, study, retrieve, transmit, and manipulate data,[1] or information, often in the context of a business or other enterprise.[2] IT is considered a subset of information and communications technology (ICT).

Copyright is a legal right created by the law of a country that grants the author of an original work exclusive right for its use and distribution. This means whatever content the author created cannot be used or published by anyone else without the consent of the author.

131. Which of the following correctly lists computer memory types from highest to lowest speed?

(1) Secondary Storage; Main Memory (RAM); Cache Memory; CPU Registers

(2) CPU Registers; Cache Memory; Secondary Storage; Main Memory (RAM)

(3) CPU Registers; Cache Memory; Main Memory (RAM); Secondary Storage

(4) Cache Memory; CPU Registers; Main Memory (RAM); Secondary Storage

Answer: 3

Computer memory can be classified in the below given hierarchy:

1) Internal register: Internal register in a CPU is used for holding variables and temporary results. Internal registers have a very small storage; however they can be accessed instantly. Accessing data from the internal register is the fastest way to access memory.

2) Cache: Cache is used by the CPU for memory which is being accessed over and over again. Instead of pulling it every time from the main memory, it is put in cache for fast access. It is also a smaller memory, however, larger than internal register.

Cache is further classified to L1, L2 and L3:

a) L1 cache: It is accessed without any delay.

b) L2 cache: It takes more clock cycles to access than L1 cache.

c) L3 cache: It takes more clock cycles to access than L2 cache.

3) Main memory or RAM (Random Access Memory): It is a type of the computer memory and is a hardware component. It can be increased provided the operating system can handle it. Typical PCs these days use 8 GB of RAM. It is accessed slowly as compared to cache.

4) Hard disk: A hard disk is a hardware component in a computer. Data is kept permanently in this memory. Memory from hard disk is not directly accessed by the CPU, hence it is slower. As compared with RAM, hard disk is cheaper per bit.

5) Magnetic tape: Magnetic tape memory is usually used for backing up large data. When the system needs to access a tape, it is first mounted to access the data. When the data is accessed, it is then unmounted. The memory access time is slower in magnetic tape and it usually takes few minutes to access a tape.

Below given figure shows the hierarchy of computer memory:
Computer memory hierarchy: Internal register, cache, RAM, hard disk, magnetic tape

132. Which of the following is a characteristic of Web2.0 applications ?
(1) Multiple users schedule their time to use Web2.0 applications one by one.
(2) Web2.0 applications are focused on the ability for people to collaborate and share information online.
(3) Web2.0 applications provide users with content rather than facilitating users to create it.
(4) Web2.0 applications use only static pages.
Answer: 2
Web 2.0 features include social networking sites and social media sites (e.g.,Facebook), blogs, wikis, folksonomies ("tagging" keywords on websites and links), video sharing sites(e.g., YouTube), hosted services, Web applications ("apps"), collaborative consumption platforms, and mashup applications.

133. With regard to a word processing software, the process of combining static information in a publication together with variable information in a data source to create one merged publication is called
(1) Electronic mail
(2) Data sourcing
(3) Mail merge
(4) Spam mail
Answer: 3

134. DVD technology uses an optical media to store the digital data. DVD is an acronym for
(1) Digital Vector Disc
(2) Digital Volume Disc
(3) Digital Versatile Disc
(4) Digital Visualization Disc
Answer: 3

135 Which of the following statement(s) is/are TRUE?
S1: The decimal number 11 is larger than the hexadecimal number 11.
S2: In the binary number 1110.101, the fractional part has the decimal value as 0.625.
(1) S1 only
(2) S2 only
(3) Both S1 and S2
(4) Neither S1 nor S2
Answer: 2
To convert Hexadecimal number to Decimal number, multiply every digit with 16 power of digit location. Then, sum all the multipliers.
Decimal representation of hexadecimal number $11 = 1x16^1+1x16^0$
$= 16+1 = 17$
Convert decimal fraction to binary, begin with the decimal fraction and multiply by 2
Because .625 x 2 = 1.25, the first binary digit to the right of the point is a 1.
Because .25 x 2 = 0.50, the second binary digit to the right of the point is a 0.
Because .50 x 2 = 1.00, the third binary digit to the right of the point is a 1.
In fact, we do not need to multiply the fraction again, because we had 0 as the fractional part of our result there.
Hence the representation of .625 = .101 (base 2).

UNIT – 9

PROPLE AND ENVIRONMENT

UNIT 9: PEOPLE AND ENVIRONMENT

ENVIRONMNT

The term environment has been derived from a French word "Environia" means to surround. It refers to both abiotic (physical or non-living) and biotic (living) environment. The word environment means surroundings, in which organisms live. Environment and the organisms are two dynamic and complex component of nature. Environment regulates the life of the organisms including human beings. Human beings interact with the environment more vigorously than other living beings. Ordinarily environment refers to the materialsand forces that surrounds the living organism.

Environment is the sum total of conditions that surrounds us at a given point of time and space. It is comprised of the interacting systems of physical, biological and cultural elements which are interlinked both individually and collectively. Environment is the sum total of conditions in which an organism has to survive or maintain its life process. It influences the growth and development of living forms.

Components of Environment:

Environment mainly consists of atmosphere, hydrosphere, lithosphere and biosphere. But it can be roughly divided into two types such as (a) Micro environment and (b) Macro environment. It can also be divided into two other types such as (c) Physical and (d) biotic environment.

(a) Micro environment refers to the immediate local surrounding of the organism.

(b) Macro environment refers to all the physical and biotic conditions that surround the organism externally.

(c) Physical environment refers to all abiotic factors or conditions like temperature, light, rainfall, soil, minerals etc. It comprises of atmosphere, lithosphere and hydrosphere.

(d) Biotic environment includes all biotic factors or living forms like plants, animals, Micro-organisms.

Components or segments of environment are given below:

1. Atmosphere – the sphere of air.
2. Hydrosphere – the sphere of water.
3. Lithosphere – the sphere of soil, rock, etc.
4. Biosphere – the sphere of living organisms.

Gas		Volume[A]	
Name	Formula	in ppmv[B]	in %
Nitrogen	N_2	780,840	78.084
Oxygen	O_2	209,460	20.946
Argon	Ar	9,340	0.9340
Carbon dioxide	CO_2	400	0.04
Neon	Ne	18.18	0.001818
Helium	He	5.24	0.000524
Methane	CH_4	1.79	0.000179
Not included in above dry atmosphere:			
Water vapor[C]	H_2O	10–50,000[D]	0.001%–5% [D]

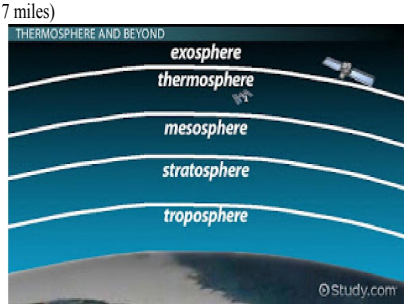
Notes:
[A] volume fraction is equal to mole fraction for ideal gas only, also see volume (thermodynamics)
[B] ppmv: parts per million by volume
[C] Water vapor is about 0.25% *by mass* over full atmosphere
[D] Water vapor strongly varies locally

ATMOSPHERE:

The thick, gaseous cover of air surrounding the earth is called atmosphere. It sustains life on earth by removing harmful cosmic and ultraviolet rays through absorption, maintaining heat balance, providing oxygen for respiration and carbon dioxide for photosynthesis. On the basis of temperature gradients, the atmosphere can be segmented as follows:

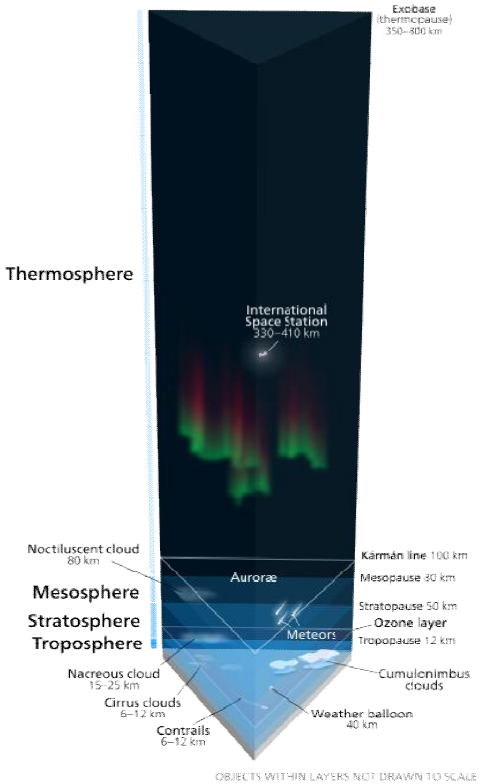
the five main layers are:

- **Exosphere:** 700 to 10,000 km (440 to 6,200 miles)
- **Thermosphere:** 80 to 700 km (50 to 440 miles)
- **Mesosphere:** 50 to 80 km (31 to 50 miles)
- **Stratosphere:** 12 to 50 km (7 to 31 miles)
- **Troposphere:** 0 to 12 km (0 to 7 miles)



(a) Troposphere: The troposphere is the lowest layer of Earth's atmosphere. It extends from Earth's surface to an average height of about 12 km, although this altitude actually varies from about 9 km (30,000 ft) at the poles to 17 km (56,000 ft) at the equator, with some variation due to weather. The troposphere is bounded above by the tropopause, a boundary marked in most places by a temperature inversion (i.e. a layer of relatively warm air above a colder one), and in others by a zone which is isothermal with height
(b) Stratosphere: The stratosphere is the second-lowest layer of Earth's atmosphere. It lies above the troposphere and is separated from it by the tropopause. This layer extends from the top of the troposphere at roughly 12 km (7.5 mi; 39,000 ft) above Earth's surface to the stratopause at an altitude of about 50 to 55 km (31 to 34 mi; 164,000 to 180,000 ft).
(c) Mesosphere: The mesosphere is the third highest layer of Earth's atmosphere, occupying the region above the stratosphere and below the thermosphere. It extends from the stratopause at an altitude of about 50 km (31 mi; 160,000 ft) to the mesopause at 80–85 km (50–53 mi; 260,000–280,000 ft) above sea level.
(d) Thermosphere: The thermosphere is the second-highest layer of Earth's atmosphere. It extends from the mesopause (which separates it from the mesosphere) at an altitude of about 80 km (50 mi; 260,000 ft) up to the thermopause at an altitude range of 500–1000 km (310–620 mi; 1,600,000–3,300,000 ft). The height of the thermopause varies considerably due to changes in solar activity. Because the thermopause lies at the lower boundary of the exosphere, it is also referred to as the exobase. The lower part of the thermosphere, from 80 to 550 kilometres (50 to 342 mi) above Earth's surface, contains the ionosphere.
(e) Exosphere: The exosphere is the outermost layer of Earth's atmosphere (i.e. the upper limit of the atmosphere). It extends from the exobase, which is located at the top of the thermosphere at an altitude of about 700 km above sea level, to about 10,000 km (6,200 mi; 33,000,000 ft) where it merges into the solar wind.

Earth's atmosphere Lower 4 layers of the atmosphere in 3 dimensions as seen diagonally from above the exobase. Layers drawn to scale, objects within the layers are not to scale. Aurorae shown here at the bottom of the thermosphere can actually form at any altitude in this atmospheric layer



Hydrosphere:

Approximately 70 per cent of the earth's surface is made up of water and constitutes the hydrosphere. The water resources include oceans, seas, rivers, lakes, streams, ponds, glaciers, polar ice caps and ground water.

Of this, about 97 per cent of the water is salty and is present in oceans and seas, 2 per cent is present as ice caps and the remaining 1 per cent as fresh water which we use variously.

Water near the poles is very cold and freezes to form polar ice caps, glaciers or icebergs. However, at the equator water evaporates into gas due to high temperature.

The frozen water in its own sphere is known as 'cryosphere'. Water is very essential for life and it is believed that the first signs of life were found in water.

Lithosphere (Land):

Lithosphere is the solid component of earth. It consists of three layers: crust, mantle and core. Generally speaking, lithosphere means the hard surface (crust) of earth and not the entire inside of the planet. The uppermost part of the solid earth, consisting of weathered rocks, minerals and organic matters together, is known as soil. Land is very important for use in agriculture, industrialization, transportation, recreation, etc. The interior of the lithosphere consists of mantle followed by core.

Biosphere :

It is that part of earth where living (biotic) organisms exist and interact with one another and also with the non-living (abiotic) components. The living organisms include all of the micro-organisms, plants and animals.

Biosphere reaches well into the other three spheres, although there are no permanent inhabitants in the atmosphere. Relative to the volume of the earth, the biosphere constitutes only a very thin surface layer, which extends from 11,000 meters below sea level to 15,000 meters above it. In general, biosphere includes most of the hydrosphere as well as parts of lower atmosphere and upper lithosphere.

The biosphere contains large quantities of elements such as carbon, nitrogen and oxygen. Other essential elements like phosphorus, calcium and potassium are present in smaller amounts.

Bulk of the functioning in the eco-system is based on the input of solar energy and there is continual recycling of materials at the eco-system and biosphere levels.

For example, green plants use carbon dioxide for photosynthesis and release oxygen into the atmosphere, which is then inhaled by the animals for respiration who in return release carbon dioxide. In the biosphere, there exist interactions among the

organisms. When an organism interacts with members of its own kind, it is an intra-specific interaction like colonization and then aggregation, etc.

On the other hand, interaction between different species is known as inter-specific interaction like neutralism, competition and prey-predator relationships. The interactions may be harmful or beneficial to the participants but are very important for the survival, growth, reproduction and continuance of the species.

Ways to Conserve and Protect Our Environment

1. When going shopping, make it a habit to bring your own eco-bags and say no to plastic bags as much as possible.
2. Join as many tree planting trips as you can.
3. If possible, try carpooling to work, business presentations, events, or even to run errands. Think of ways you can reduce the number of trips you make using your car.
4. Reduce emissions from cars by walking or cycling. These are not just great alternatives to driving, they are also great exercise.
5. Use public transport, when you can, for everyday travel.
6. Send your drinking bottles, paper, used oil, old batteries and used tires to a depot for recycling or safe disposal; all these very cause serious pollution.
7. Do not pour chemicals and waste oil on to the ground or into drains leading to bodies of water.
8. Wherever possible, separate biodegradable and recyclable waste from non-biodegradable and work to reduce the amount of non-biodegradable or recyclable waste.
9. Reduce the amount of meat you eat, or even better become vegetarian.

How do humans affect the environment? How we destroy environment?

1. Polluting
2. Non-Veg diet
3. Technology
4. Deforestation
5. Excess usage of commodities
6. Wastage of resources: water, power, petroleum etc.

POLLUTION:

Humans pollute a lot and contribute to air pollution, water, sound, radiation, light and even soil pollution.

This is due to many of the human activities like travel, power generation, industrial waste dumped into rivers, polyethylene waste, artificial methods used in agriculture, cell phones, wifi etc.

This pollution is harmful not only to humans but also to animals and plants around. This pollution decreases the healthy life span.

NON-VEG DIET:

Humans digestive tract is a long one like that of the herbivorous animal. While that of the gut of carnivorous animals is small & less unfolded. This indicates that humans are suitable for vegetable diet. Even evolution theory says humans are from monkeys which are herbivores. But interestingly most of the human population relies on the non-veg diet. This reliance on the non-veg diet is expensive in terms of environment. Because to grow a hen of I kilo weight we need many kilos of wheat.

Instead, a kilo of wheat is sufficient for a diet of more than two individuals. So we grow animals for food at the cost of many kilos of herbal diet. This requires growing cereals in many acres of land by use of manures, pesticides etc. which is again polluting to nature. Similarly, we kill many birds, deer and other mild animals from the forest for sake of diet. This decreases their population drastically and is a cause of extinction.

TECHNOLOGY:

Though technology is making lives of humans easier and comfortable. It poses a great threat to the environment. The threat is due to pollution, radiation hazards, exploitation of natural resources etc.

Radiation hazard is increasing day by day due use of mobile phones and Wi-Fi around us. Hence we can notice that many small birds and insects like honey bees are not found around these days. Even governments are promising to give free Wi-Fi without realizing its harmful effects. If you wish to know the harsh effects, sit in a library or conference room with Wi-Fi enabled inside. You will notice to be having stomach acidity or a headache there. Wi-Fi reduces the use of wired internet connectivity. Still, it has untoward effects on the humans and environments. Even we can see that there are some companies building resorts as a means of holiday trip into the deepest woods in the world.

DEFORESTATION:

Deforestation and widespread destruction of trees and plants in the name of expansion and urbanization drastically effect the environment around. Thus we are exploiting the nature and environment beyond the safe limits. Hence we can see wild animals getting into villages and attacking humans.

Deforestation is decreasing the forest area and endangering the lives of wild animals. They have no place to hide, no proper lakes or ponds for drinking water etc. Hence animals die due to dehydration, starvation, and even accidents.

Excess usage of commodities: We use many commodities out of fantasy than really required. We tend to own a hundred pairs of leather shoes, purses, belts etc. All of them are made of skin and hides of animals. Many animals like cows, buffaloes, ox, pig are killed for their skin though not for food. This way the unlimited desire for commodities is, in fact, causing a great pain and suffering to the normal animals. Even the tigers, elephants are killed in large numbers for their hide, nails, and tusks in the name of decorative items. Thus, the human's greed for more is causing them to be extinct in few more years.

WASTAGE OF RESOURCES:

We have been exploiting coal, petroleum for our needs by digging the earth crest for decades. Most of the extraction of petroleum is done in the name of storage for future needs. In future, if technology reverts to hydrogen fuels this petroleum stored might go waste. Also instead of natural methods, we use coal for power generation. This coal once dug leaves cavities in the earth surface. These cavities can be troublesome in times of floods and also cause of earthquakes. Also, we have been wasting many resources including soils, water.

Chemical effluents

Transportation

Secondary pollutant

POLLUTANTS AND AIR QUALITY

Air pollutants are substances that adversely affect the environment by interfering with climate, the physiology of plants, animal species, entire ecosystems, as well as with human property in the form of agricultural crops or man-made structures. We list climate at the top of the list to reflect the fact that global climate change has been recognized as one of the most important environmental challenges to be faced by humanity in the 21st century. In this context certain climate forcing agents—the most important one being carbon dioxide—which otherwise cause no harm to living organisms, should be added to the list of "classic" pollutants, along with such compounds as oxides of nitrogen or sulfur. On the other hand, climate research has linked certain compounds long recognized as air pollutants (for instance black carbon) to the warming of climate, thus providing one more reason for their control.

Air pollutants can originate from natural or anthropogenic (man-made) sources, or both. Examples of natural sources of pollution include volcanic eruptions or wind erosion. Emissions from internal combustion engines are an exemplary source of anthropogenic pollution. Some sources of pollution, such as forest fires, can be related to both natural phenomena and human activities.

Atmospheric reactions can transform primary pollutants into different chemical species. These reactions can produce both harmless compounds and secondary air pollutants that may be more harmful than their precursors.

The world's most important air pollutants, their sources, and known or suspected environmental effects are listed in Table 1 (after [Sher 1998]).

Table 1: Air Pollutants, Their Sources, and Effects

Pollutant	Natural Source	Anthropogenic Source	Environmental Effect
Nitrogen oxides (NO + NO2)	Lightnings, soil bacteria	High temperature fuel combustion—motor vehicles, industrial, and utility	Primary pollutants that produce photochemical smog, acid rain, and nitrate particulates. Destruction of stratospheric ozone. Human health impact.
Particulates	Forest fires, wind erosion, volcanic eruption	Combustion of biofuels such as wood, and fossil fuels such as coal or diesel	Reduced atmospheric visibility. Human health impact. Black carbon particulates contribute to global warming.
Sulfur dioxide	Volcanic eruptions and decay	Coal combustion, ore smelters, petroleum refineries, diesel engines burning high-sulfur fuels	Acid rain. Human health impact.
Ozone	Lightning, photochemical reactions in the troposphere	Secondary pollutant produced in photochemical smog	Damage to plants, crops, and man-made products. Human health impact.
Carbon monoxide	Unnoticeable	Rich & stoichiometric combustion, mainly from motor vehicles	Human health impact
Carbon dioxide	Animal respiration, decay, release from oceans	Fossil fuel and wood combustion	Most common greenhouse gas
Non-methane hydrocarbons (VOC)	Biological processes	Incomplete combustion, solvent utilization	Primary pollutants that produce photochemical smog
Methane	Anaerobic decay, cud-chewing animals, oil wells	Natural gas leak and combustion	Greenhouse gas
Chlorofluorocarbons (CFC)	None	Solvents, aerosol propellants, refrigerants	Destruction of stratospheric ozone

Governments and international organizations have been taking actions to protect the quality of air, as well as—in more recent years—to control emissions of climate forcing agents. Ambient air quality standards and guidelines, issued by environmental protection authorities, are instrumental in achieving the air quality objective. An example of such legislation is set by the US National Ambient Air Quality Standards (NAAQS) adopted by the Environmental Protection Agency (EPA). The NAAQS apply to both human health

(primary standard) and public welfare (secondary standard). Primary standards protect sensitive members of the human population from adverse health effects of criteria air pollutants. Secondary standards protect the public welfare from any known or anticipated adverse effects associated with the presence of a pollutant in the ambient air. Welfare effects include effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, climate, damage to and deterioration of property, hazards to transportation, as well as effects on economic values and personal comfort and well-being.

Under the US Clean Air Act of 1990, the NAAQS standards set maximum ambient concentration limits for six criteria pollutants including:

i. Ozone, O3
ii. Carbon monoxide, CO
iii. Nitrogen dioxide, NO2
iv. Lead, Pb
v. Particulate matter below 10 μm, PM10
vi. Oxides of sulfur, SOx

PRIMARY & SECONDARY POLLUTANT

Definition:

A ***primary pollutant*** is an air pollutant emitted directly from a source.

A ***secondary pollutant*** is not directly emitted as such, but forms when other pollutants (primary pollutants) react in the atmosphere.

Examples of a secondary pollutant include ozone, which is formed when hydrocarbons (HC) and nitrogen oxides (NOx) combine in the presence of sunlight; NO2, which is formed as NO combines with oxygen in the air; and acid rain, which is formed when sulfur dioxide or nitrogen oxides react with water.

PEOPLE AND ENVIRONMENT INTERACTION

Deals with people and environment, Population is a near permanent group of interbreeding individuals of a species found in a space or geographical area at a particular point.

The main factors affecting population are as follows:

1. Natality (birth rate)
2. Mortality (death rate)
3. Population dispersal (emigration, immigration, and migration)
4. Age distribution (pre-reproductive, reproductive, and post-reproductive)
5. Population growth rate
6. Carrying resources mainly food, water, space-there are limited resources to support all life forms

Population density is number of individuals divided by space. The term environment is derived from the French word environment. It means 'to surround'. According to the Environment (Protection) Act, 1986, environment includes all the physical and biological surroundings of an organism and their interactions. Environment is defined as the sum of water, air, and land, and the interrelation-ships that exist among them and with the human beings, other living organisms, and materials.

There are essentially **two kinds of ecosystems;** Aquatic and Terrestrial. Any other sub-ecosystem falls under one of these two headings.

1. Terrestrial ecosystems

Terrestrial ecosystems can be found anywhere apart from heavily saturated places. They are broadly classed into:

2. The Forest Ecosystems

They are the ecosystems in which an abundance of flora, or plants, is seen so they have a big number of organisms which live in relatively small space. Therefore, in forest ecosystems the density of living organisms is quite high. A small change in this ecosystem could affect the whole balance, effectively bringing down the whole ecosystem. You could see a fantastic diversity in the fauna of the ecosystems, too. They are further divided into:

- ***a) Tropical evergreen forest:*** These are tropical forests that receive a mean rainfall of 80 for every 400 inches annually. The forests are characterised by dense vegetation which comprises tall trees at different heights. Each level is shelter to different types of animals.
- ***b) Tropical deciduous forest:*** There, shrubs and dense bushes rule along with a broad selection of trees. The type of forest is found in quite a few parts of the world while a large variety of fauna and flora are found there.
- ***c) Temperate evergreen forest:*** Those have quite a few number of trees as mosses and ferns make up for them. Trees have developed spiked leaves in order to minimize transpiration.
- ***d) Temperate deciduous forest:*** The forest is located in the moist temperate places that have sufficient rainfall. Summers and winters are clearly defined and the trees shed the leaves during the winter months.
- ***e) Taiga:*** Situated just before the arctic regions, the taiga is defined by evergreen conifers. As the temperature is below zero for almost half a year, the remainder of the months, it buzzes with migratory birds and insects.

3. The Desert Ecosystem

Desert ecosystems are located in regions that receive an annual rainfall less than 25. They occupy about 17 percent of all the land on our planet. Due to the extremely high temperature, low water availability and intense sunlight, fauna and flora are scarce and poorly developed. The vegetation is mainly shrubs, bushes, few grasses and rare trees. The stems and leaves of the plants are modified in

order to conserve water as much as possible. The best known desert ones are the succulents such as the spiny leaved cacti. The animal organisms include insects, birds, camels, reptiles all of which are adapted to the desert (xeric) conditions.

4. The Grassland Ecosystem

Grasslands are located in both the tropical and temperate regions of the world though the ecosystems vary slightly. The area mainly comprises grasses with a little number of trees and shrubs. The main vegetation includes grasses, plants and legumes that belong to the composite family. A lot of grazing animals, insectivores and herbivores inhabit the grasslands. The two main kinds of grasslands ecosystems are:

Savanna: The tropical grasslands are dry seasonally and have few individual trees. They support a large number of predators and grazers.

Prairies: It is temperate grassland, completely devoid of large shrubs and trees. Prairies could be categorized as mixed grass, tall grass and short grass prairies.

5. The Mountain Ecosystem

Mountain land provides a scattered and diverse array of habitats where a large number of animals and plants can be found. At the higher altitudes, the harsh environmental conditions normally prevail, and only the treeless alpine vegetation can survive. The animals that live there have thick fur coats for prevention from cold and hibernation in the winter months. Lower slopes are commonly covered with coniferous forests.

6. Aquatic Ecosystems

The aquatic ecosystem is the ecosystem found in a body of water. It encompasses aquatic flora, fauna and water properties, as well. There are two main types of aquatic ecosystem - Marine and Freshwater.

7. The Marine Ecosystem

Marine ecosystems are the biggest ecosystems, which cover around 71% of Earth's surface and contain 97% of out planet's water. Water in Marine ecosystems features in high amounts minerals and salts dissolved in them. The different divisions of the marine ecosystem are:

- ***Oceanic:*** A relatively shallow part of oceans which lies on the continental shelf.
- ***Profundal:*** deep or Bottom water.
- ***Benthic Bottom substrates.***
- ***Inter-tidal:*** The place between low and high tides.
- ***Estuaries***
- ***Coral reefs***
- ***Salt marshes***
- ***Hydrothermal vents where chemosynthetic bacteria make up the food base.***

Many kinds of organisms live in marine ecosystems: *the brown algae, corals, cephalopods, echinoderms, dinoflagellates and sharks.*

THE FRESHWATER ECOSYSTEM

Contrary to the Marine ecosystems, the freshwater ecosystem covers only 0.8% of Earth's surface and contains 0.009% of the total water. Three basic kinds of freshwater ecosystems exist:

Lentic: *Slow-moving or till water like pools, lakes or ponds.*

Lotic: *Fast-moving water such as streams and rivers.*

Wetlands: *Places in which the soil is inundated or saturated for some lenghty period of time.*

The ecosystems are habitats to reptiles, amphibians and around 41% of the world's fish species. The faster moving turbulent waters typically contain a greater concentrations of dissolved oxygen, supporting greater biodiversity than slow moving waters in pools.

CHARACTERISTICS

Do you want to learn more about ecosystems? Below, you will find out some of the ***characteristics of ecosystems.***

A closed system: though it may be permeable to outside influences, an ecosystem can be thought of as a relatively self contained system.

Interdependence: the organisms that live in an ecosystem are dependent on each other, and their actions and lives impact on each other's lives.

Dynamic: ecosystems are able to change and evolve – indeed evolution is one reason why we have distinct ecosystems in the first place.

Adapted: the organisms in an ecosystem have adapted to their environments. They live in such a way as to draw the most benefit from the environment.

Fragile: many ecosystems are considerably fragile when faced with global warming, pollution and other human made problems in the world. One example is the marine ecosystem of the great ***barrier reef:*** the precious and ancient coral in this reef is now visibly dying out due to human pollution.

Beautiful: the organisms in various ecosystems have a beauty of their own – not just taken as individuals but also in their interactions with other organisms in the ecosystem. Many scientists and biologists find the delicate balance of organisms in an ecosystem to be something very beautiful in its own right, and indeed this can be a key reason why girls and boys decide to study science at school and university – and to become biologists as adults.

IMPORTANCE OF ECOSYSTEM

Ecosystems are all responsible for keeping the planet as a whole in balance. Animals and other life forms can only thrive if their ecosystems are thriving as a whole. And, the lives of humans are very much dependent on the life of all of the ecosystems in the

planet. Though ecosystems can be thought of as distinct systems, they are also all connected with each other and if one ecosystem starts to fail this can have repercussions on other ecosystems all across the world. Ecosystems are very important for many reasons. Below, you will find seven reasons why ecosystems are so important.

1. Biodiversity: All the millions of species that exist on planet earth are sustained by their particular ecosystems. Ecosystems are thus important places for ensuring that biodiversity continues on this planet.

2. Evolution: Organisms within an ecosystem have evolved to subsist within that ecosystem. For example, marine animals have evolved to live in the sea.

3. Interconnectedness: The organisms in any given ecosystem are usually highly interconnected. For example, their relationship may be one of predator and prey, or it may be a bird whose droppings adds nutrients to the soil, enabling different plants and trees to flourish there. As such, it is important to understand that no species exists in total isolation. Rather, their habits and biology are shaped by the ecosystem in which they live. This interconnectedness is actually the reason for some of the flamboyant colors and behavior that we see in many of the world's species. The need to stand out competitively within an ecosystem has led to the elaborate mating dances of spiders, for instance, and the gorgeous plumage of birds.

4. Self sustaining: The delicate balance of organisms within an ecosystem helps to keep that ecosystem going. For example, you might think that removing one species of insect from a forest ecosystem would do no harm, but the presence of those insects could have been sustaining vast numbers of birds and pollinating vast numbers of flowers, trees and shrubs in the ecosystem. Without the insects, the ecosystem would not survive.

5. A reminder of the wild world: Watching how ecosystems work in a perfect balance can remind humans of the fact that nature has its own rules and that we interfere with the workings of nature at great risk. This is why it is worthwhile to listen to the opinions of biologists on how humans ought best to behave in order to preserve the planet for future generations. Observing an ecosystem, and understanding that as humans we are also organisms living within an ecosystem, can give us some useful perspective about our place within the world. Rather than purely autonomous beings, we are deeply connected to the other organisms around us.

6. Regulating the climate: The 'respiration' of forest ecosystems, and the ability of insects to pollinate wide swathes of flower meadows means that many ecosystems help to regulate the amounts of carbon in our climate. In addition, many types of ecosystem protect the earth against extreme weather: forests provide barriers to floods and storms and also prevent the soil from being eroded by the rain. Without the ecosystems that we have now, the world would be made up of very different landscapes, many of them barren.

7. Sources of food and fuel: Plants and fruits are key energy sources (rice is a staple food throughout much of the world, for example) whilst many crops can be used for biomass fuel. Used responsibly, the food and fuel that we get from nearby ecosystems can provide us with sustainable solutions to all of our energy needs.

FUNCTIONS OF ECOSYSTEM OR ECOSYSTEM SERVICES

The Millennium Ecosystem Assessment (MA) report 2005 defines *Ecosystem services* as benefits people obtain from ecosystems and distinguishes four categories of ecosystem services, where the so-called supporting services are regarded as the basis for the services of the other three categories.

Supporting services

These include services such as nutrient recycling, primary production and soil formation. These services make it possible for the ecosystems to provide services such as food supply, flood regulation, and water purification.

Provisioning services

- food (including seafood and game), crops, wild foods, and spices
- raw materials (including lumber, skins, fuel wood, organic matter, fodder, and fertilizer)
- genetic resources (including crop improvement genes, and health care)
- water
- Biogenic minerals
- medicinal resources (including pharmaceuticals, chemical models, and test and assay organisms)
- energy (hydropower, biomass fuels)
- ornamental resources (including fashion, handicraft, jewelry, pets, worship, decoration and souvenirs like furs, feathers, ivory, orchids, butterflies, aquarium fish, shells, etc.)

Regulating services

- carbon sequestration and climate regulation
- waste decomposition and detoxification
- purification of water and air
- pest and disease control

Cultural services

- cultural (including use of nature as motif in books, film, painting, folklore, national symbols, architect, advertising, etc.)
- spiritual and historical (including use of nature for religious or heritage value or natural)
- recreational experiences (including ecotourism, outdoor sports, and recreation)
- science and education (including use of natural systems for school excursions, and scientific discovery)
- Therapeutic (including Ecotherapy, social forestry and animal assisted therapy)

There is discussion as to how the concept of cultural ecosystem services can be operationalized. A good review of approaches in landscape aesthetics, cultural heritage, outdoor recreation, and spiritual significance to define and assess cultural values of our environment so that they fit into the ecosystem services approach is given by Daniel et al. who vote for models that explicitly link

ecological structures and functions with cultural values and benefits. There also is a fundamental critiqueof the concept of cultural ecosystem services that builds on **three arguments:**

- Pivotal cultural values attaching to the natural/cultivated environment rely on an area's unique character that cannot be addressed by methods that use universal scientific parameters to determine ecological structures and functions.
- If a natural/cultivated environment has symbolic meanings and cultural values the object of these values are not ecosystems but shaped phenomena like mountains, lakes, forests, and, mainly, symbolic landscapes.
- Those cultural values do result not from properties produced by ecosystems but are the product of a specific way of seeing within the given cultural framework of symbolic experience.

BIOGEOCHEMICAL CYCLE

In Earth science, a biogeochemical cycle or substance turnover is a pathway by which a chemical substance moves through both the biotic (biosphere) and abiotic (lithosphere, atmosphere, and hydrosphere) components of Earth. A cycle is a series of change which comes back to the starting point and which can be repeated. Water, for example, is always recycled through the water cycle, as shown in the diagram. The water undergoes evaporation, condensation, and precipitation, falling back to Earth. Elements, chemical compounds, and other forms of matter are passed from one organism to another and from one part of the biosphere to another through biogeochemical cycles.

The term "biogeochemical" tells us about the biological, geological and chemical factors. The circulation of chemical nutrients like carbon, oxygen, nitrogen, phosphorus, calcium, and water etc. through the biological and physical world are known as "biogeochemical cycles". In effect, the element is recycled, although in some cycles there may be places (called *reservoirs*) where the element is accumulated or held for a long period of time (such as an ocean or lake for water).

The most well-known and important biogeochemical cycles, for example,

- the carbon cycle,
- the nitrogen cycle,
- the oxygen cycle,
- the phosphorus cycle,
- the sulfur cycle,
- the water cycle, (Hydrological cycle)
- and the rock cycle.

There are many biogeochemical cycles that are currently being studied for the first time as climate change and human impacts are drastically changing the speed, intensity, and balance of these relatively unknown cycles. These newly studied biogeochemical cycles include

- The mercury cycle, and
- The human-caused cycle of atrazine, which may affect certain species.

Biogeochemical cycles always involve hot equilibrium states: a balance in the cycling of the element between compartments. However, overall balance may involve compartments distributed on a global scale.

ECOLOGY

The term ecology was coined by Ernst Haeckel in 1869. Ecology deals with the study of organisms in their natural home. It is the scientific study of the relations that living organisms have with respect to each other and their natural environment the ecosystems.

It is present at three levels, which are as follows:

(1) The individual organism (how individuals are affected by the environment and how they, in turn, affect the environment)

(2) The population

(3) The community.

Ecology is defined as the study of ecosystems.

Ecological Footprint: The ecological footprint measures human consumption of natural resources in comparison to Earth's ecological capacity to regenerate them. Calculation of the footprint takes into account our consumption habits both at (i) micro (individual) level. The objective of its calculation is also to educate people about the need to change our consumption behaviour to make it more sustainable. Ecological footprint is measured in global hectares (gha)

Community

A community is an assemblage of all the interacting populations of different species in a geographical area. It is a complex interacting network of plants, animals, and microorganisms.

Ecosystem

The term ecosystem was defined by Arthur Tansley in 1935. Ecosystem is a self- regulating community of living organisms (populations of species), interacting with each other and their nonliving, physical environment, for example, forest ecosystem and ocean ecosystem.

Ecotone: An ecotone is the transitional area of vegetation between two different plant communities, such as forest and grassland. The influence of the two bordering communities
on each other is known as the edge effect.

Biotic Components (Living Components)

Living components in an ecosystem are either the producers or the consumers. They are also called the biotic components. Producers produce organic components, for example, plants produce starch, carbohydrates, and cellulose by a process called photosynthesis.

(1) Producers (or Autotrophs): These produce their own food. Green plants produce food. Green plants produce food through photosynthesis, by combining carbon dioxide and water with the help of energy in the form of sunlight.

(2) Consumers: Consumers depend upon producers for their food, for example, human beings and other animals.
They are of the following types:
(a) Herbivores feed on plants, for example, rabbit and insects.
(b) Carnivores are those animals that eat other animals.
(i) Secondary carnivores feed on herbivores, for example, a frog and a small fish.
(ii) Tertiary carnivores feed on other carnivores for example, a snake and a big fish.
(c) Omnivores feed on both plants and animals, for example, humans, rates, and many species of birds.
(d) Detrivores feed on dead organisms, for example, earthworms, crabs, and ants. The living beings that feed on dead or decayed organic matter are also called saprophytes. The are fungi and bacteria.
(3) Decomposers: These are microorganisms that break down organic matter into inorganic compounds and in this process, derive their nutrition. In ecology, abiotic components are non-living chemical and physical factors in the environment that affect the ecosystems. Examples are water, light, wind, soil, humidity, minerals, and gases.

FOOD CHAINS

Now, we can take a look at how energy and nutrients move through a ecological community. Let's start by considering just a few who-eats-who relationships by looking at a food chain.
A *food chain* is a linear sequence of organisms through which nutrients and energy pass as one organism eats another. Let's look at the parts of a typical food chain, starting from the bottom—the producers—and moving upward.

- At the base of the food chain lie the primary producers. The primary producers are autotrophs and are most often photosynthetic organisms such as plants, algae, or cyanobacteria.
- The organisms that eat the primary producers are called primary consumers. Primary consumers are usually herbivores, plant-eaters, though they may be algae eaters or bacteria eaters.
- The organisms that eat the primary consumers are called secondary consumers. Secondary consumers are generally meat-eaters—carnivores.
- The organisms that eat the secondary consumers are called tertiary consumers. These are carnivore-eating carnivores, like eagles or big fish.
- Some food chains have additional levels, such as quaternary consumers—carnivores that eat tertiary consumers. Organisms at the very top of a food chain are called apex consumers.

Food webs:

Food chains give us a clear-cut picture of who eats whom. However, some problems come up when we try and use them to describe whole ecological communities.
For instance, an organism can sometimes eat multiple types of prey or be eaten by multiple predators, including ones at different trophic levels. This is what happens when you eat a hamburger patty! The cow is a primary consumer, and the lettuce leaf on the patty is a primary producer.
To represent these relationships more accurately, we can use a *food web*, a graph that shows all the trophic—eating-related—interactions between various species in an ecosystem. The diagram below shows an example of a food web from Lake Ontario. Primary producers are marked in green, primary consumers in orange, secondary consumers in blue, and tertiary consumers in purple.
In food webs, arrows point from an organism that is eaten to the organism that eats it. As the food web above shows, some species can eat organisms from more than one trophic level. For example, opossum shrimp eat both primary producers and primary consumers.

TROPHIC LEVELS AND ECOLOGICAL PYRAMIDS

The trophic levels form a pyramid, with producers at the bottom, then primary consumers (herbivores), secondary consumers (carnivores), and tertiary carnivores.

Ecological Pyramids-Trophic Levels

The concept of ecological pyramid was developed by Charles Elton. All ecological pyramids begin with producers like plants at the bottom and proceed through various trophic levels such as herbivores (consume plants), carnivores (prey on herbivores), and so on. The highest level is at the top of the food chain.
There are three types of ecological pyramids, which are as follows:

- Pyramid of energy (Pyramid of production)
- Pyramid of energy
- Pyramid of numbers
- Pyramid of biomass

(1) Pyramid of Energy

The pyramid of energy or the energy pyramid describes the overall nature of the ecosystem. During the flow of energy form one organism to other, there is considerable loss of energy in the form of heat.

- The energy pyramid is always upright and vertical.
- This pyramid shows the flow of energy at different trophic level and is maximum at the lowest trophic level.
- It depicts the energy is minimum at the highest trophic level and is maximum at the lowest trophic level.

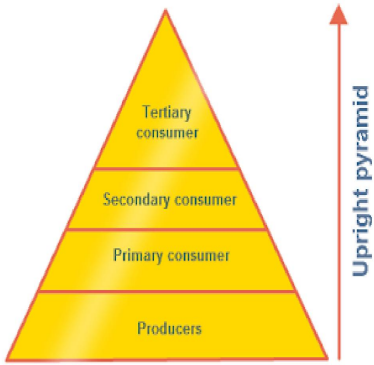
(2) Pyramid of Numbers

The pyramid of numbers depicts the relationship in terms of the numbers of producers, herbivores, and the carnivores at their successive trophic levels. There are three types of pyramid of numbers, which are as follows:

- Upright pyramid of number
- partly upright pyramid of number

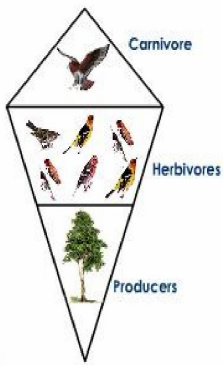
- Inverted pyramid of number

Upright Pyramid of Number: This type of pyramid number is found in the aquatic and grassland ecosystems.



Pyramid of Number

Partly Upright Pyramid of Number: It is seen in the forest ecosystem where the number of producers are lesser in number and support a greater number of herbivores and which in turn support a fewer number of carnivores.



Partly Upright Pyramid of Number

Inverted Pyramid of Number

This type of ecological pyramid is seen in parasitic food chain where one primary producer supports numerous parasites which support more hyperparasites.

(3) Pyramid of biomass:

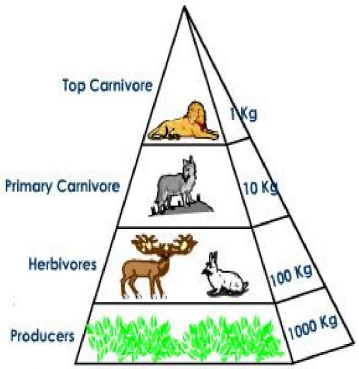
It is more fundamental, they represent the quantitative relationships of the standing crops. In this pyramid there is a gradual decrease in the biomass from the producers to the higher trophic levels. The biomass here the net organisms collected from each feeding level and are then dried and weighed. This dry weight is the biomass and it represents the amount of energy available in the form of organic matter of the organisms. In this pyramid the net dry weight is plotted to that of the producers, herbivores, carnivores, etc.

There are two types of pyramid of biomass, they are:

- Upright pyramid of biomass and
- Inverted pyramid of biomass.

Upright Pyramid of Biomass

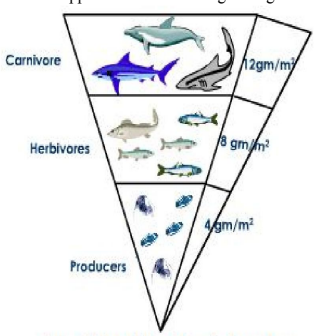
This occurs when the larger net biomass of producers support a smaller weight of consumers. Example: Forest ecosystem.



Upright Pyramid of biomass in a Terrestrial Ecosystem

Inverted Pyramid of Biomass

This happens when the smaller weight of producers support consumers of larger weight. Example: Aquatic ecosystem.



Inverted Pyramid in an Aquatic Ecosystem

RELATED TO TROPHIC LEVELS

Eutrophic: Water bodies having good quantity of minerals and hence supra optimum growth of plants.

Oligotrophic: Water bodies deficient in minerals and organic growth.

Dystrophic: Water bodies rich in unrecompensed organic matter, e.g., bogs and marshy lakes.

Biosphere: There are different types of ecosystems around us, which involve living organisms and non-living things. If we combine all the ecosystems present on earth, it is called biosphere.

Biomes: The terrestrial portion of biosphere is divided into biomes. They usually have distinct climates and life forms adapted to that climate.

Habitat: The area or natural environment in which an organism or population normally lives is called habitat.

Pollutants are generally grouped under two classes

Biodegradable pollutants

Examples of such pollutants are domestic waste products, urine and faucet matter, sewage, agricultural residue, paper, wood and cloth etc.

Non- Biodegradable pollutants

Non-biodegradable pollutants are stronger chemical bondage; do not break down into simpler and harmless products. These include various insecticides and other pesticides, mercury, lead, arsenic, aluminum, plastics, radioactive waste etc.

CLASSIFICATION OF ENVIRONMENTAL POLLUTION

Pollution can be broadly classified according to the components of environment that are polluted. Environmental pollution consists of five basic types of pollution, namely, air, water, soil, noise and light.

1. Air pollution

Air pollution – Air pollution may be defined as the presence of one or more contaminants like dust, mist, smoke and colour in the atmosphere that are injurious human beings, plants and animals

- Most prominent and dangerous form of pollution
- mainly a mixture of various gases such as oxygen, carbon dioxide, nitrogen

- carbon monoxide (CO), sulfur dioxide (SO2), hydrocarbons (HC), oxides of nitrogen (NOx), lead, arsenic, asbestos, radioactive matter, and dust.
- Release of sulfur dioxide and hazardous gases into the air causes global warming and acid rain;
- Carbon dioxide, a greenhouse gas, is the main pollutant
- Other greenhouse gases include methane—which comes from such sources as swamps and gas emitted by livestock—and chlorofluorocarbons (CFCs), which were used in refrigerants and aerosol propellants until they were banned because of their deteriorating effect on Earth's ozone layer.
- The major threat comes from burning of fossil fuels, such as coal and petroleum products. Thermal power plants, automobiles and industries are major sources of air pollution as well.
- Another pollutant associated with climate change is sulfur dioxide, a component of smog. Sulfur dioxide and closely related chemicals are known primarily as a cause of acid rain.
- Evidence of increasing air pollution is seen in lung cancer, asthma, allergies, and various breathing problems along with severe and irreparable damage to flora and fauna.
- Global warming is a consequence of green house effect caused by increased level of carbon dioxide (CO2). Ozone (O3) depletion has resulted in UV radiation striking our earth.
- "carbon footprint"—the amount of carbon dioxide a person is responsible for putting into the atmosphere.
- Kyoto Protocol, an agreement between countries that they will cut back on carbon dioxide emissions.
- The effects of air pollution are evident too. Release of sulphur dioxide and hazardous gases into the air causes global warming and acid rain; which in turn have increased temperatures, erratic rains and droughts worldwide; making it tough for the animals to survive
- India's first Air Quality Index SAFAR – India(System of Air Quality and Weather Forecasting And Research)initially be available to people in 10 cities for now — Delhi, Faridabad, Agra, Kanpur, Lucknow, Varanasi, Ahmedabad, Bangalore, Chennai and Hyderabad.
- The index considers eight pollutants — PM10, PM2.5, NO2, SO2, CO, O3, NH3 and Pb). The likely health implications of the six categories would also be provided with a color code.
- AQI, hosted on CPCB's website, air pollution levels have been classified in six bands with simple descriptions to help people understand it. Each band has cut points of concentration with a colour code to visually express the level of severity that people can comprehend easily. Air quality is classified 'good' if the pollution levels are at least 50% below regulatory standards.
- Indoor air quality (IAQ)

2. Water Pollution

Infested with waste ranging from floating plastic bags to chemical waste, our water bodies have turned into a pool of poison. Few Examples:

  - Raw sewage running into lake or streams
  - Industrial waste spills contaminating groundwater
  - Radiation spills or nuclear accidents
  - Illegal dumping of substances or items within bodies of water
  - Biological contamination, such as bacteria growth
  - Farm runoff into nearby bodies of water

- Pollution of water occurs when substances that will modify the water in negative fashion are discharged in it. This discharge of pollutants can be direct as well as indirect.
- Water pollutants include insecticides and herbicides, food processing waste, pollutants from livestock operations, volatile organic compounds (VOCs), heavy metals, chemical waste and others.
- Industries produce huge amount of waste which contains toxic chemicals and pollutants which can cause air pollution and damage to us and our environment. They contain pollutants such as lead, mercury, sulphur, asbestos, nitrates and many other harmful chemicals. Many industries do not have proper waste management system and drain the waste in the fresh water which goes into rivers, canals and later in to sea.
- The garbage produce by each household in the form of paper, aluminum, rubber, glass, plastic, food if collected and deposited into the sea in some countries. These items take from 2 weeks to 200 years to decompose.
- The toxic chemicals have the capability to change the color of water, increase the amount of minerals, also known as Eutrophication, change the temperature of water and pose serious hazard to water organisms.
- The sewage water carries harmful bacteria and chemicals that can cause serious health problems. Pathogens are known as a common water pollutant.
- The sewers of cities house several pathogens and thereby diseases. Microorganisms in water are known to be causes of some very deadly diseases and become the breeding grounds for other creatures that act like carriers.

Steps Taken by INDIA Govt. to reduce the Pollution

The Central Pollution Control Board (CPCB) has taken several positive steps to minimize pollution of the environment.

Important Environmental Laws:

1. Water (Prevention and Control of Pollution) Act, 1974

- The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution, and for the maintaining or restoring of wholesomeness of water in the country. The Act was amended in 1988.

2. Air (Prevention and Control of Pollution) Act, 1981

The Air (Prevention and Control of Pollution) Act was enacted in 1981 and amended in 1987 to provide for the prevention, control and abatement of air pollution in India.

3. Cess Act, 1977
4. Environment (Protection) Act, 1986
5. Public Liability Insurance Act, 1981
6. National Environmental Tribunal Act, 1995
7. National Environmental Appellate Authority Act, 1997
8. Compensatory Afforestation Fund Management and Planning Authority (CAMPA)
9. The *Biological Diversity Act 2002* was born out of India's attempt to realise the objectives enshrined in the United Nations Convention on Biological Diversity (CBD) 1992 which recognizes the sovereign rights of states to use their own Biological Resources.
10. The National Green Tribunal has been established on 18.10.2010 under the National Green Tribunal Act 2010 for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto. It is a specialized body equipped with the necessary expertise to handle environmental disputes involving multi-disciplinary issues.

Summary:

Pollution not only affect humans by destroying their respiratory, cardiovascular and neurological systems; it also affects the nature, plants, fruits, vegetables, rivers, ponds, forests, animals, etc, on which they are highly dependent for survival. It is crucial to control pollution as the nature, wildlife and human life are precious gifts to the mankind.

LIST OF ENVIRONMENTAL RESEARCH INSTITUTES:

This is a list of environmental research institutes, by country or region. These organizations undertake research on the sustainable management of resources, including water, energy and biodiversity.

- Center for Environmental Nuclear Research (CENR)
- Center for Environmental Planning and Technology (CEPT)
- Indian Agricultural Research Institute (IARI)
- National Environmental Engineering Research Institute (NEERI)
- The Energy and Resources Institute (TERI)
- Centre for Environment Education (CEE)
- Sri Paramakalyani Centre for Environmental Sciences (SPKCES)

PREVIOUS YEARS SOLVED MCQs

1. Global warming during winter becomes more pronounced at the:

(A) Equator
(B) Poles
(C) Tropic of Cancer
(D) Tropic of Capricorn

Answer: D

The five major circles of latitude are, from north to south:

- The Arctic Circle (66° 33′ 38″ N)
- The Tropic of Cancer (23° 26′ 22″ N)
- The Equator (0° latitude)
- The Tropic of Capricorn (23° 26′ 22″ S) Global warming during winter
- The Antarctic Circle (66° 33′ 38″ S)

Tropic of Cancer at which the Sun appears directly perpendicular on June 21 in an event that is called Summer Solstice.

2. In the study of man-environment interaction, the statement of Miss Semple that "the humans are solely the product of their environment", is:

(A) An opinion
(B) A prejudice
(C) A fact
(D) A widely accepted phenomenon

Answer: C

3. In analysis of man-environment relationship Pragmatic Possibilism implies that:

(A) There is no limit for man to exploit resources of earth
(B) There are limited possibilities to explore earth's resources
(C) The man has to watch and assess the situation and then go ahead with resource utilization
(D) The man has to keep in mind only his basic needs while planning to harness the potential of resourceful earth

Answer C

Pragmatism considers thought an instrument or tool for prediction, problem solving and action, and rejects the idea that the function of thought is to describe, represent, or mirror reality. Pragmatists contend that most philosophical topics—such as the nature of knowledge, language, concepts, meaning, belief, and science—are all best viewed in terms of their practical uses and successes.

The philosophy of pragmatism "emphasizes the practical application of ideas by acting on them to actually test them in human experiences". Pragmatism focuses on a "changing universe rather than an unchanging one as the Idealists, Realists and Thomists had claimed"

4. Arrange Column II in proper sequence so as to match it with Column I and choose the correct answer from the codes given below:

Column I	**Column II**
Activity	**Noise Level**
(a) Hearing	(i) 30 dB
(b) Whispering	(ii) 1 dB
(c) Interference with sleep	(iii) 60 dB
(d) Normal talk	(iv) 30–50 dB

Codes :

	(a)	(b)	(c)	(d)
(A)	(i)	(ii)	(iii)	(iv)
(B)	(ii)	(i)	(iv)	(iii)
(C)	(iv)	(ii)	(iii)	(i)
(D)	(iii)	(i)	(ii)	(iv)

Answer: B

Sound is measured in units called decibels. Decibel levels begin at zero, which is near total silence and the softest sound the average young person can hear. By comparison, a whisper is 30 decibels and normal conversational speech is about 60 decibels. An increase of 10 decibels means that a sound is 10 times more powerful. The sound of an ambulance siren at 120 decibels is about 1 trillion times more intense than the weakest sound the average person can hear. Sounds that reach 120 decibels are painful to our ears at close distances and are dangerous to our hearing.

How loud is too loud?

The noise chart below lists average decibel levels for everyday sounds around you.

Painful

150 dBP = fireworks at 3 feet (impulse noise)
140 dBP = firearms (impulse noise)
140 dBA = jet engine
130 dBA = jackhammer
120 dBA = jet plane takeoff, siren

Extremely Loud
110 dBA = maximum output of some MP3 players, model airplane, chain saw
106 dBA = gas lawn mower, snowblower
100 dBA = hand drill, pneumatic drill
90 dBA = subway, passing motorcycle
Very Loud
80–90 dBA = blow-dryer, kitchen blender, food processor
National Institute for Occupational Safety and Health (NIOSH) recommends that workers in noisy environments 85 dBA or louder for an 8-hour workday limit their exposure at this loudness level.
Loud (safe for 24 hours or more)
70 dB = busy traffic, vacuum cleaner, alarm clock
Moderate (safe for 24 hours or more)
60 dBA = typical conversation, dishwasher, clothes dryer
50 dBA = moderate rainfall
40 dBA = quiet room
Faint (safe for 24 hours or more)
30 dB = whisper, quiet library

5. The maximum loss of forest lands in India is caused by:
(A) River valley projects
(B) Industries
(C) Means of transportation
(D) Agriculture
Answer: A

6. Bitumen is obtained from
(A) Forests and Plants
(B) Kerosene oil
(C) Crude oil
(D) Underground mines
Answer: C
Bitumen is a mixture of dark, sticky, highly viscous organic liquids composed mainly of aromatic hydrocarbons. It is usually black or dark brown in color. Bitumen found in nature is known as crude bitumen, and that obtained by the distillation of crude oil is called refined bitumen. It is now possible to produce bitumen from non-petroleum based renewable resources such as sugar, molasses, or starch. Materials that contain bitumen are described as bituminous, such as bituminous coal and bituminous rock.

7. Malaria is caused by:
(A) bacterial infection
(B) viral infection
(C) parasitic infection
(D) fungal infection
Answer: C

8. The cloudy nights are warmer compared to clear nights (without clouds) during winter days. This is because:
(A) clouds radiate heat towards the earth
(B) clouds prevent cold wave from the sky, descend on earth
(C) clouds prevent escaping of the heat radiation from the earth
(D) clouds being at great heights from earth absorb heat from the sun and send towards the earth
Answer: C

9. Largest soil group of India is:
(A) Red soil
(B) Black soil
(C) Sandy soil
(D) Mountain soil
Answer C

Major classification of Indian soils
- Alluvial soil [43%]
- Red soil [18.5%]
- Black / regur soil [15%]
- Arid / desert soil
- Laterite soil
- Saline soil
- Peaty / marshy soil
- Forest soil
- Sub-mountain soil

- Snowfields

Alluvial soil:

- Mostly available soil in India (about 43%) which covers an area of 143 sq.km.
- Widespread in northern plains and river valleys.
- In peninsular-India, they are mostly found in deltas and estuaries.
- Humus, lime and organic matters are present.
- Highly fertile.
- Indus-Ganga-Brahmaputhra plain, Narmada-Tapi plain etc are examples.
- They are depositional soil – transported and deposited by rivers, streams etc.
- Sand content decreases from west to east of the country.
- New alluvium is termed as Khadar and old alluvium is termed as Bhangar.
- Colour: Light Grey to Ash Grey.
- Texture: Sandy to silty loam or clay.
- Rich in: potash
- Poor in: phosphorous.
- Wheat, rice, maize, sugarcane, pulses, oilseed etc are cultivated mainly.

Red soil:

- Seen mainly in low rainfall area.
- Also known as Omnibus group.
- Porous, friable structure.
- Absence of lime, kankar (impure calcium carbonate).
- Deficient in: lime, phosphate, manganese, nitrogen, humus and potash.
- Colour: Red because of Ferric oxide. The lower layer is reddish yellow or yellow.
- Texture: Sandy to clay and loamy.
- Wheat, cotton, pulses, tobacco, oilseeds, potato etc are cultivated.

Black soil / regur soil:

- Regur means cotton – best soil for cotton cultivation.
- Most of the Deccan is occupied by Black soil.
- Mature soil.
- High water retaining capacity.
- Swells and will become sticky when wet and shrink when dried.
- Self-ploughing is a characteristic of the black soil as it develops wide cracks when dried.
- Rich in: Iron, lime, calcium, potassium, aluminum and magnesium.
- Deficient in: Nitrogen, Phosphorous and organic matter.
- Colour: Deep black to light black.
- Texture: Clayey.

Laterite soil:

- Name from Latin word 'Later' which means Brick.
- Become so soft when wet and so hard when dried.
- In the areas of high temperature and high rainfall.
- Formed as a result of high leaching.
- Lime and silica will be leached away from the soil.
- Organic matters of the soil will be removed fast by the bacteria as it is high temperature and humus will be taken quickly by the trees and other plants. Thus, humus content is low.
- Rich in: Iron and Aluminum
- Deficient in: Nitrogen, Potash, Potassium, Lime, Humus
- Colour: Red colour due to iron oxide.
- Rice, Ragi, Sugarcane and Cashew nuts are cultivated mainly.

Desert / arid soil:

- Seen under Arid and Semi-Arid conditions.
- Deposited mainly by wind activities.
- High salt content.
- Lack of moisture and Humus.
- Kankar or Impure Calcium carbonate content is high which restricts the infiltration of water.
- Nitrogen is insufficient and Phosphate is normal.
- Texture: Sandy
- Colour: Red to Brown.

Peaty / marshy soil:

- Areas of heavy rainfall and high humidity.
- Growth of vegetation is very less.
- A large quantity of dead organic matter/humus which makes the soil alkaline.
- Heavy soil with black colour.

Forest soil:

- Regions of high rainfall.
- Humus content is less and thus the soil is acidic.

Mountain soil:

- In the mountain regions of the country.
- Immature soil with low humus and acidic.

10. Main pollutant of the Indian coastal water is
(A) oil spill
(B) municipal sewage
(C) industrial effluents
(D) aerosols
Answer: C

11. Human ear is most sensitive to noise in the following frequency ranges:
(A) 1-2 KHz
(B) 100-500 Hz
(C) 10-12 KHz
(D) 13-16 KHz
Answer: A is given in UGC answer key but answer should be none of above

The human hearing range depends on both the pitch of the sound – whether it is high or low – and the loudness of the sound. Pitch is measured in Hertz (Hz) and loudness is measured in decibels (dB).
How to convert kilohertz to Hz
1kHz = 1000Hz or 1Hz = 0.001kHz

For a person with normal hearing, when it comes to pitch the human hearing range starts low at about 20 Hz. That's about the same as the lowest pedal on a pipe organ. On the other side of the human hearing range, the highest possible frequency heard without discomfort is 20,000Hz. While 20 to 20,000Hz fo rms the absolute borders of the human hearing range, our hearing is most sensitive in the 2000 - 5000 Hz frequency range

12. Which species of chromium is toxic in water?
(A) Cr+2
(B) Cr+3
(C) Cr + 6
(D) Cr is non-toxic element
Answer: C
The World Health Organization-recommended maximum allowable concentration in drinking water for chromium (VI) is 0.05 milligrams per litre. Hexavalent chromium is also one of the substances whose use is restricted by the European Restriction of Hazardous Substances Directive.

13. Match List - I (Dams) with List - II (River) in the following:

List - I (Dams)	**List - II (River)**
a. Bhakra	(i) Krishna
b. Nagarjunasagar	(ii) Damodar
c. Panchet	(iii) Sutlej
d. Hirakud	(iv) Bhagirathi
e. Tehri	(v) Mahanadi

	a	b	c	d	e
(A)	v	iii	iv	ii	i
(B)	iii	i	ii	v	iv
(C)	i	ii	iv	iii	v
(D)	ii	iii	iv	i	v

Answer: B

14. Water is always involved with landslides. This is because it:
(A) Reduces the shear strength of rocks
(B) Increases the weight of the overburden
(C) Enhances chemical weathering
(D) is a universal solvent
Answer: A shear: break off or cause to break off, owing to a structural strain.

15. Which is the smallest North-east State in India?
(A) Tripura

(B) Meghalaya
(C) Mizoram
(D) Manipur
Answer: A

The total population of Northeast India is 46 million. 68 percent of the total population live in Assam alone.

State	Population	Males	Females	Sex Ratio	Literacy %	Rural Population	Urban Population	Area (km²)	Density (/km²)
Arunachal Pradesh	1,383,727	713,912	669,815	938	65.38	870,087	227,881	83,743	17
Assam	31,205,576	15,939,443	15,266,133	958	72.19	23,216,288	3,439,240	78,438	397
Manipur	2,570,390	1,290,171	1,280,219	992	79.21	1,590,820	575,968	22,327	122
Meghalaya	2,966,889	1,491,832	1,475,057	989	74.43	1,864,711	454,111	22,429	132
Mizoram	1,097,206	555,339	541,867	976	91.33	447,567	441,006	21,081	52
Nagaland	1,978,502	1,024,649	953,853	931	79.55	1,647,249	342,787	16,579	119
Sikkim	610,577	323,070	287,507	890	81.42	480,981	59,870	7,096	86
Tripura	3,673,917	1,874,376	1,799,541	960	87.22	2,653,453	545,750	10,486	350

Sikkim has the area of 7,096 sq km and stands 2nd place in the list of top 10 smallest in India .It was formed in the year 1975 .It is bordered by West Bengal ,Nepal ,Tibet and Bhutan . This is a part of seven sisters of the east.

Here is the list of Top 10 Smallest States in India

10. Punjab
9. Haryana
8. Kerala
7. Meghalaya
6. Manipur
5. Mizoram
4. Nagaland
3. Tripura
2. Sikkim
1. Goa

16. Tamilnadu coastal belt has drinking water shortage due to:
(A) High evaporation
(B) sea water flooding due to tsunami
(C) Over exploitation of ground water by tube wells
(D) seepage of sea water
Answer: D
Tamil Nadu gears up to tackle worst water shortage in over 140 years
17. While all rivers of Peninsular India flow into the Bay of Bengal, Narmada and Tapti flow into the Arabian Sea because these two rivers:
(A) Follow the slope of these rift valleys
(B) The general slope of the Indian peninsula is from east to west
(C) The Indian peninsula north of the Satpura ranges, is tilted towards the west
(D) The Indian peninsula south of the satpura ranges is tilted towards east
Answer: A
Rivers on the Indian peninsular plateau flow from West to East because of the gradient of the land. However, Narmada and Tapi flow in opposite direction because they do not flow on the plateau surface but in rift valleys and these valleys happen to have an opposite gradient.
There are three main reasons:
1. Gradient of the terrain
2. Presence of rift valleys
3. Mountain ranges which deflect rivers.
18. Soils in the Mahanadi delta are less fertile than those in the Godavari delta because of:
(A) Erosion of top soils by annual floods
(B) Inundation of land by sea water
(C) Traditional agriculture practices
(D) The derivation of alluvial soil from red-soil hinterland
Answer: A
19. Assertion (A): Aerosols have potential for modifying climate
Reason (R): Aerosols interact with both short waves and radiation

(A) Both (A) and (R) are true, and (R) is the correct explanation of (A)
(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A)
(C) (A) is true, but (R) is false
(D) (A) is false, but (R) is true
Answer: A

20. The most significant impact of volcanic eruption has been felt in the form of:
(A) change in weather
(B) sinking of islands
(C) loss of vegetation
(D) extinction of animals
Answer: A

Positive and negative effects of an volcanic eruption

Positive	Negative
The dramatic scenery created by volcanic eruptions attracts tourists. This brings income to an area.	Many lives can be lost as a result of a volcanic eruption.
The lava and ash deposited during an eruption breaks down to provide valuable nutrients for the soil. This creates very fertile soil which is good for agriculture	If the ash and mud from a volcanic eruption mix with rain water or melting snow, fast moving mudflows are created. These flows are called lahars.
The high level of heat and activity inside the Earth, close to a volcano, can provide opportunities for generating geothermal energy.	Lava flows and lahars can destroy settlements and clear areas of woodland or agriculture.
	Human and natural landscapes can be destroyed and changed forever.

21. With absorption and decomposition of CO_2 in ocean water beyond desired level, there will be:
(A) Decrease in temperature
(B) Increase in salinity
(C) Growth of phytoplankton
(D) Rise in sea level
Answer: C

Phytoplanktons are microscopic organisms that live in watery environments, both salty and fresh.
Some phytoplanktons are bacteria, some are protests, and most are single-celled plants. Among the common kinds are cyan bacteria, silica-encased diatoms, din flagellates, green algae, and chalk-coated coccolithophores.
Phytoplankton growth depends on the availability of carbon dioxide, sunlight, and nutrients.

22. Arrange column II in proper sequence so as to match it with column I and choose the correct answer from the code given below:

Column I (Water Quality)	**Column II** (pH Value)
(a) Neutral	(i) 5
(b) Moderately acidic	(ii) 7
(c) Alkaline	(iii) 4
(d) Injurious	(iv) 8

Code:

	(a)	(b)	(c)	(d)
(A)	(ii)	(iii)	(i)	(iv)
(B)	(i)	(iii)	(ii)	(iv)
(C)	(ii)	(i)	(iv)	(iii)
(D)	(iv)	(ii)	(iii)	(i)

Answer: C

23. The maximum emission of pollutants from fuel sources in India is caused by:
(A) Coal
(B) Firewood
(C) Refuse burning
(D) Vegetable waste product
Answer: A

24. The urbanisation process accounts for the wind in the urban centres during nights to remain:
(A) faster than that in rural areas
(B) slower than that in rural areas
(C) the same as that in rural areas
(D) cooler than that in rural areas
Answer: A

25. Tsunami occurs due to:
(A) Mild earthquakes and landslides in the oceans
(B) Strong earthquakes and landslides in the oceans
(C) Strong earthquakes and landslides in mountains
(D) Strong earthquakes and landslides in deserts
Answer: B
26. Which of the natural hazards have big effect on Indian people each year?
(A) Cyclones
(B) Floods
(C) Earthquakes
(D) Landslides
Answer: B
27. Comparative Environment Impact Assessment study is to be conducted for:
(A) the whole year
(B) three seasons excluding monsoon
(C) any three seasons
(D) the worst season
Answer: A
Environmental impact assessments (EIAs) apply criteria to minimize the negative effects of projects on the environment
28. Sea level rise results primarily due to:
(A) Heavy rainfall
(B) Melting of glaciers
(C) Submarine volcanism
(D) Seafloor spreading
Answer: B
29. The plume rise in a coal based power plant depends on:
(i) Buoyancy
The force that causes objects to float.
(ii) Atmospheric stability
(iii) Momentum of exhaust gases
Identify the correct code:
(A) (i) and (ii) only
(B) (ii) and (iii) only
(C) (i) and (iii) only
(D) (i), (ii) and (iii)
Answer: B
30. Deforestation during the recent decades has led to:
(A) Soil erosion
(B) Landslides
(C) Loss of bio-diversity
(D) All the above
Answer: D
31. Which one of the following natural hazards is responsible for causing highest human disaster?
(A) Earthquakes
(B) Snow-storms
(C) Volcanic eruptions
(D) Tsunami
Answer: D
32. Which one of the following is appropriate for natural hazard mitigation?
(A) International AID
(B) Timely Warning System
(C) Rehabilitation
(D) Community Participation
Answer: B
33. Slums in metro-city are the result of:
(A) Rural to urban migration
(B) Poverty of the city-scape
(C) Lack of urban infrastructure
(D) Urban-governance
Answer: A
34. The great Indian Bustard bird is found in:

(A) Thar Desert of India
(B) Coastal regions of India
(C) Temperate Forests in the Himalaya
(D) Tarai zones of the Himalayan Foot

Answer: A

Great Indian bustard (Ardeotis nigriceps), large bird of the bustard family (Otididae), one of the heaviest flying birds in the world. The great Indian bustard inhabits dry grasslands and scrublands on the Indian subcontinent; its largest populations are found in the Indian state of Rajasthan.

June 2008

35. Human ear is most sensitive to noise in which of the following ranges:

(A) 20 Hz -20 KHz
(B) 100-500 Hz
(C) 10-12 KHz
(D) 13-16 KHz

Answer: A

36. Which one of the following units is used to measure intensity of noise?

(A) decibel
(B) Hz
(C) Phon
(D) Watts/m^2

Answer: A

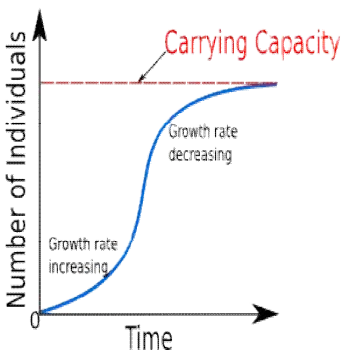
The dB is a logarithmic way of dscribing a ratio. The ratio may be power, sound pressure, voltage or intensity or several other things. Hertz is a unit of frequency (of change in state or cycle in a sound wave, alternating current, or other cyclical waveform) of one cycle per second. It replaces the earlier term of "cycle per second (cps)."

37. If the population growth follows a logistic curve, the maximum sustainable yield:

(A) is equal to half the carrying capacity.
(B) is equal to the carrying capacity.
(C) depends on growth rates.
(D) depends on the initial population.

Answer: A

If we look at a graph of a population undergoing logistic population growth, it will have a characteristic S-shaped curve. The population grows in size slowly when there are only a few individuals. Then the population grows faster when there are more individuals. Finally, having lots of individuals in the population causes growth to slow because resources are limited. In logistic growth, a population will continue to grow until it reaches carrying capacity, which is the maximum number of individuals the environment can support.



38. Chemical weathering of rocks is largely dependent upon:

(A) high temperature
(B) strong wind action
(C) heavy rainfall
(D) glaciation

Answer: C

The primary agents in chemical weathering are water, oxygen, and acids. Chemical weathering is the weakening and subsequent disintegration of rock by chemical reactions. These reactions include oxidation, hydrolysis, and carbonation. These processes either form or destroy minerals, thus altering the nature of the rock's mineral composition

39. Structure of earth's system consists of the following:

Match List-I with List-II and give the correct answer.

List-I (Zone)	List-II (Chemical Character)
(a) Atmosphere	(i) Inert gases
(b) Biosphere	(ii) Salt, fresh water, snow and ice
(c) Hydrosphere	(iii) Organic substances, skeleton matter
(d) Lithosphere	(iv) Light silicates

Codes:

	(a)	(b)	(c)	(d)
(A)	(ii)	(iii)	(i)	(iv)
(B)	(i)	(iii)	(ii)	(iv)
(c)	(ii)	(i)	(iii)	(iv)
(D)	(iii)	(i)	(ii)	(iv)

Answer: B

The silicates make up about 95 percent of the Earth's crust and upper mantle

40. Which of the following pairs regarding typical composition of hospital wastes is incorrect?

(A) Plastic- 9-12%
(B) Metals- 1-2%
(C) Ceramic- 8-10%
(D) Biodegradable- 35-40%

Answer: A

41. Fresh water achieves its greatest density at:

(A) -4° C
(B) 0° C
(C) 4° C
(D) -2.5° C

Answer: C

42. Which one of the following is not associated with earthquakes?

(A) Focus
(B) Epicenter
(C) Seismograph
(D) Swells

Answer: D

43. The tallest trees in the world are found in the region :

(A) Equatorial region
(B) Temperate region
(C) Monsoon region
(D) Mediterranean region

Answer: B

In geography, temperate or tepid latitudes of Earth lie between the tropics and the polar regions. These regions generally have more variety in temperature over the course of the year and more distinct changes between seasons compared with tropical climates, where such variations are often small

44. Match List-I with List-II and select the correct answer from the codes given below:

List-I (National Parks)	List - II (States)
(a) Periyar	(i) Orissa
(b) Nandan Kanan	(ii) Kerala
(c) Corbett National Park	(iii) Rajasthan
(d) Sariska Tiger Reserve	(iv) Uttarakhand

Codes:

	(a)	(b)	(c)	(d)
(A)	(ii)	(i)	(iv)	(iii)
(B)	(i)	(ii)	(iv)	(iii)
(C)	(iii)	(ii)	(i)	(iv)
(D)	(i)	(ii)	(iii)	(iv)

Answer: A

45. Environmental impact assessment is an objective analysis of the probable changes in:

(A) Physical characteristics of the environment
(B) Biophysical characteristics of the environment
(C) socio-economic characteristics of the environment
(D) All the above

Answer: D

46. Bog is a wetland that receives water from:

(A) nearby water bodies
(B) melting
(C) rain fall only
(D) sea only
Answer: C
Bog an area of wet muddy ground that is too soft to support a heavy body, their main source of water is rainwater, which contains few minerals.
47. Which of the following region is in the very high risk zone of earthquakes?
(A) Central Indian Highland
(B) Coastal region
(C) Himalayan region
(D) Indian desert
Answer: C
48. Match List-I with List-II and select the correct answer using the codes given below:

List-I (Institutes)	**List-II (Cities)**
(a) Central Arid Zone Institute	(i) Kolkata
(b) Space Application Centre	(ii) New Delhi
(c) Indian Institute of Public Administration	(iii) Ahmedabad
(d) Headquarters of Indian Science Congress	(iv) Jodhpur

Codes:

	(a)	(b)	(c)	(d)
(A)	(iv)	(iii)	(ii)	(i)
(B)	(iv)	(ii)	(i)	(iii)
(C)	(iii)	(i)	(ii)	(iv)
(D)	(i)	(ii)	(iv)	(iii)

Answer A
49. Indian coastal areas experienced Tsunami disaster in the year:
(A) 2005
(B) 2004
(C) 2006
(D) 2007
Answer: B
50. The great Indian Bustard bird is found in
(A) Thar Desert of Rajasthan
(B) Coastal regions of India
(C) Malabar Coast
(D) Delta regions
Answer: A
51. The Sagarmanthan National Park has been established to preserve the eco-system of which mountain peak?
(A) Kanchenjunga
(B) Mount Everest
(C) Annapurna
(D) Dhaulavira
Answer: B
The Sagarmāthā National Park is a protected area in the Himalayas of eastern Nepal that is dominated by Mount Everest
52. Maximum soot is released from
(A) Petrol vehicles
(B) CNG vehicles
(C) Diesel vehicles
(D) Thermal Power Plants
Answer: D
soot a deep black powdery or flaky substance consisting largely of amorphous carbon, produced by the incomplete burning of organic matter. soot from coal burning, internal-combustion engines, power-plant boilers, hog-fuel boilers, ship boilers, central steam-heat boilers, waste incineration, local field burning, house fires, forest fires, fireplaces, and furnaces.
53. Surface Ozone is produced from
(A) Transport sector
(B) Cement plants
(C) Textile industry
(D) Chemical industry
Answer: A

54. Which one of the following non-conventional energy sources can be exploited most economically?
(A) Solar
(B) Wind
(C) Geo-thermal
(D) Ocean Thermal Energy Conversion (OTEC)
Answer: A
non-conventional energy Those energy sources which are renewable and ecologically safe.
In India, non-conventional energy sources consist of those energy sources that are infinite, natural, and restorable. For example, tidal energy, solar energy, and wind energy are nonconventional sources of energy. Fascinatingly, the application of tidal energy and wind energy was operational in the form of energy sources long back when mineral oil, coal, and natural gas were not broadly introduced as conventional sources of energy
55. The most recurring natural hazard in India is
(A) Earthquakes
(B) Floods
(C) Landslides
(D) Volcanoes
Answer: B
56. Which type of natural hazards cause maximum damage to property and lives?
(A) Hydrological
(B) Hydro-meteorological
(C) Geological
(D) Geo-chemical
Answer: B
Hydrometeorological hazard — 'a process or phenomenon of atmospheric, hydrological or oceanographic nature that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (includes tropical cyclones, thunderstorms, hailstorms, tornados, blizzards, heavy snowfall, avalanches, coastal storm surges, floods including flash floods, drought, heatwaves and cold spells).
57. Dioxins are produced from
(A) Wastelands
(B) Power plants
(C) Sugar factories
(D) Combustion of plastics
Answer: D
Dioxin is classified by the National Toxicology Program and the World Health Organization as a known human carcinogen. Dioxin causes increases in cancers throughout the body and is believed to intensify the effects of other toxic chemicals. Some workers with high level exposures developed rare cancers of connective and soft tissues called soft tissue sarcomas. Dioxin is a known endocrine disrupter.
Dioxin is an unwanted byproduct of the manufacture and burning of products that contain chlorine. The incineration of plastics made of polyvinyl chloride (PVC) is a major source. So are paper mills that bleach wood pulp with chlorine. Incinerators across the country discharge dioxins every day. Even backyard burning of plastic trash can produce dioxins.
Once dioxin enters the environment, it attaches to dust particles and can be carried long distances by the wind. From there, dioxin molecules are absorbed by plants and small organisms, moving up the food chain to fish, animals and humans.
58. The slogan "A tree for each child" was coined for
(A) Social forestry programme
(B) Clean Air programme
(C) Soil conservation programme
(D) Environmental protection programme
Answer: A
59. The main constituents of biogas are
(A) Methane and Carbon di-oxide
(B) Methane and Nitric oxide
(C) Methane, Hydrogen and Nitric oxide
(D) Methane and Sulphur di-oxide
Answer: A
Biogas is an econimically friendly and clean renewable energy source. The gas can be utilized to meet several energy services, such as lighting and space heating, generation of electricity, and fuel for cooking. "Biogas is produced under anaerobic conditions; the process is denominated as anaerobic digestion. The major constituent of biogas is methane (55-70%), CO_2 (30-45%) and some traces of gases such as H_2S and ammonia. Common digester feedstock (feeding material) is cow, buffalo, and pig manure" (Buysman, 2009)
60. Assertion (A): In the world as a whole, the environment has degraded during past several decades.
Reason (R): The population of the world has been growing significantly.
(A) (A) is correct, (R) is correct and (R) is the correct explanation of (A).

(B) (A) is correct, (R) is correct and (R) is not the correct explanation of (A).
(C) (A) is correct, but (R) is false.
(D) (A) is false, but (R) is correct.
Answer: B
61. Climate change has implications for
(1) Soil moisture
(2) Forest fires
(3) Biodiversity
(4) Ground water
Identify the correct combination according to the code:
Codes:
(A) 1 and 3
(B) 1, 2 and 3
(C) 1, 3 and 4
(D) 1, 2, 3 and 4
Answer: D
62. Which of the following is not covered in 8 missions under the Climate Action Plan of Government of India?
(A) Solar power
(B) Waste to energy conversion
(C) Afforestation
(D) Nuclear energy
Answer: D
63. The concentration of Total Dissolved Solids (TDS) in drinking water should not exceed
(A) 500 mg/L
(B) 400 mg/L
(C) 300 mg/L
(D) 200 mg/L
Answer: A
500 mg/L is the limit of TDS for Drinking water stipulated by WHO as well as BIS.
The Bureau of Indian Standards
64. 'Chipko' movement was first started by
(A) Arundhati Roy
(B) Medha Patkar
(C) Ila Bhatt
(D) Sunderlal Bahuguna
Answer: D
65. The constituents of photochemical smog responsible for eye irritation are
(A) SO_2 and O_3
(B) SO_2 and NO_2
(C) HCHO and PAN
(D) SO_2 and SPM
Answer: C
Smog is a kind of air pollution. It is the blend of smoke and fog. There are two kinds of smog:
a) Classical smog
b) Photochemical smog
The two smogs can be differentiated as follows:

	Classical smog	Photochemical smog
Occurrence	It occurs in a cool, humid climate.	It occurs in a dry, sunny climate.
Components	Smoke, fog, and Sulphur dioxide.	PAN, acrolein, ozone, formaldehyde, nitric oxide.
Nature	It is reducing in nature	It is oxidizing in nature.

formaldehyde (HCHO)
Photochemical smog is oxidizing smog owing to the presence of NO2 and O3,causing corrosion of metals, stones, rubber, and painted surfaces. The other major components of photochemical smog are PAN, acrolein, and formaldehyde. Both PAN and ozone are eye irritants, while nitric oxide (formed from NO2) causes nose and throat irritation. At higher concentrations, photochemical smog causes chest pain, headaches, throat dryness, and various respiratory ailments.

Major Chemical Pollutants in Photochemical Smog:
Sources and Environmental Effects

Toxic Chemical	Sources	Environmental Effects	Additional Notes
Nitrogen Oxides (NO and NO2)	- combustion of oil, coal, gas in both automobiles and industry - bacterial action in soil - forest fires - volcanic action - lightning	- decreased visibility due to yellowish color of NO2 - NO2 contributes to heart and lung problems - NO2 can suppress plantgrowth - decreased resistance to infection - may encourage the spread of cancer	- all combustion processes account for only 5 % of NO2 in the atmosphere, most is formed from reactions involving NO -concentrations likely to rise in the future
Volatile Organic Compounds (VOCs)	- evaporation of solvents - evaporation of fuels - incomplete combustion of fossil fuels - naturally occurring compounds like terpenes from trees	- eye irritation - respiratory irritation - some are carcinogenic - decreased visibility due to blue-brown haze	- the effects of VOCs are dependent on the type of chemical - samples show over 600 different VOCs in atmosphere - concentrations likely to continue to rise in future
Ozone (O3)	- formed from photolysis of NO2 - sometimes results from stratospheric ozone intrusions	- bronchial constriction - coughing, wheezing - respiratory irritation - eye irritation - decreased crop yields - damages plastics - breaks down rubber - harsh odor	- concentrations of 0.1 parts per million can reduce photosynthesis by 50 % - people with asthma and respiratory problems are influenced the most - can only be formed during daylight hours
Peroxyacetyl Nitrates (PAN)	- formed by the reaction of NO2 with VOCs (can be formed naturally in some environments)	- eye irritation - high toxicity to plants - respiratory irritation - damaging to proteins	- was not detected until recognized in smog - higher toxicity to plants than ozone

66. Assertion (A): Some carbonaceous aerosols may be carcinogenic.
Reason (R): They may contain polycyclic aromatic hydrocarbons (PAHs).
(A) Both (A) and (R) are correct and (R) is the correct explanation of (A).
(B) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
(C) (A) is correct, but (R) is false.
(D) (A) is false, but (R) is correct.
Answer: A
67. Volcanic eruptions affect
(A) atmosphere and hydrosphere
(B) hydrosphere and biosphere
(C) lithosphere, biosphere and atmosphere
(D) lithosphere, hydrosphere and atmosphere
Answer D
68. The Ganga Action Plan was initiated during the year
(A) 1986
(B) 1988
(C) 1990
(D) 1992
Answer: A
69. Identify the correct sequence of energy sources in order of their share in the power sector in India :

(A) Thermal > nuclear > hydro > wind
(B) Thermal > hydro > nuclear > wind
(C) Hydro > nuclear > thermal > wind
(D) Nuclear > hydro > wind > thermal

Answer: B

70. Chromium as a contaminant in drinking water in excess of permissible levels, causes

(A) Skeletal damage
(B) Gastrointestinal problem
(C) Dermal and nervous problems
(D) Liver/Kidney problems

Answer: (D)

Short-term: EPA has found chromium to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: skin irritation or ulceration.

Long-term: Chromium has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to liver, kidney circulatory and nerve tissues; skin irritation.

71. The main precursors of winter smog are

(A) N_2O and hydrocarbons
(B) NO_x and hydrocarbons
(C) SO_2 and hydrocarbons
(D) SO_2 and ozone

Answer: B

72. Flash floods are caused when

(A) the atmosphere is convectively unstable and there is considerable vertical wind shear
(B) the atmosphere is stable
(C) the atmosphere is convectively unstable with no vertical windshear
(D) winds are catabatic

Answer: A

73. In mega cities of India, the dominant source of air pollution is

(A) transport sector
(B) thermal power
(C) municipal waste
(D) commercial sector

Answer: A

Traffic congestion is severe in India's cities and towns. Traffic congestion is caused for several reasons, some of which are: increase in number of vehicles per kilometer of available road, a lack of intra-city divided-lane highways and intra-city expressways networks, lack of inter-city expressways, traffic accidents and chaos due to poor enforcement of traffic laws. Complete lack of traffic sense in Indian public is the main reason for the chaos on the roads.

74. Which of the following pollutants affects the respiratory tract in humans?

(A) Carbon monoxide
(B) Nitric oxide
(C) Sulphur di-oxide
(D) Aerosols

Answer: C

Combustion products: Pollutants from combustion sources include the gases, carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). It may also include particulate matter. Combustion-type pollution primarily arises indoors when there is faulty heating equipment or when these devices are inappropriately used. For example, if wood stoves, space heaters, gas ranges, furnaces and fireplaces are not properly vented and used in an enclosed space, they may all contribute to indoor pollution. It may also stem from motor vehicle exhaust emissions if a car garage is in close proximity to indoor living space. Effects from these pollutants are generally greater during seasons when heating equipment is used and air flow inside decreases to reduce heat loss.

- NO_2 and SO_2 irritate mucous membranes of the eyes, nose, throat, and respiratory tract. Because of differences in solubility, these gases affect different sites. NO_2 tends to affect the lower respiratory tract, whereas SO_2 affects the eyes and upper respiratory tract more often. Both can produce respiratory effects even at low levels of exposure, asthmatics being particularly susceptible to bronchial effects. Chronic exposure to $NO_2$is associated with increased risk of respiratory infections in young children; with chronic SO_2 exposure, there is increased respiratory symptoms and impaired lung function.
- CO is an invisible, odorless and tasteless gas that is highly toxic to humans because it prevents delivery of oxygen by the blood to the body's tissues. It is associated with a spectrum of signs and symptoms, including fatigue, weakness, headache, dizziness, confusion, nausea and vomiting, and prolonged exposure at higher levels can cause death. At lower levels, symptoms of carbon monoxide may often be mistaken for common illnesses, such as the flu.
- Particulates are small particles that are also physical irritants of the eyes, nose, throat and lungs. If small enough, they can be inhaled deep into respiratory tissues and can exacerbate pre-existing medical conditions, such as asthma. They will increase

respiratory symptoms such as coughing and wheezing in most people. Particles may also transfer chemicals that are attached to their surfaces.

Volatile organic compounds (VOCs): VOCs are chemicals that are emitted at room temperature as gases or vapours from liquids or solids. They are generally in higher concentration indoors compared to outdoors. They include chemicals such as formaldehyde, benzene and perchloroethylene. Their sources in the home are generally from building materials, furnishings and a variety of consumer products, including cleaning products, deodorizers, paints and lacquers, solvents such as paint strippers, nail polish remover and pesticides. VOCs are mainly inhaled and therefore affect mucous membranes as well. VOC exposure may manifest as eye and upper respiratory irritation, rhinitis, nasal congestion, rash, pruritus, headache, nausea, vomiting or dyspnea.

- *Formaldehyde* – This is a very common indoor air contaminant. It is found in many products and materials and has many uses. For instance, formaldehyde binds wood chips in particleboard, it is a solvent in dyes for cloth or paper, and it is used in wrinkle-resistant material and as a water-repellent in floor coverings. Among VOCs and their health effects, most is known concerning exposure to formaldehyde. Formaldehyde may cause a burning or tingling sensation in the eyes, nose and throat that goes away when the exposure is removed. It may trigger asthmatic symptoms in susceptible infants and children.

75. Which of the following pollutants is not emitted from the transport sector?
(A) Oxides of nitrogen
(B) Chlorofluorocarbons
(C) Carbon monoxide
(D) Poly aromatic hydrocarbons
Answer: B

76. Which of the following sources of energy has the maximum potential in India?
(A) Solar energy
(B) Wind energy
(C) Ocean thermal energy
(D) Tidal energy
Answer: A

77. Which of the following is not a source of pollution in soil?
(A) Transport sector
(B) Agriculture sector
(C) Thermal power plants
(D) Hydropower plants
Answer: B

78. Which of the following is not a natural hazard?
(A) Earthquake
(B) Tsunami
(C) Flash floods
(D) Nuclear accident
Answer: D

79. Ecological footprint represents
(A) Area of productive land and water to meet the resources requirement
(B) Energy consumption
(C) CO_2 emissions per person
(D) Forest cover
Answer: A

80. Irritation in eyes is caused by the pollutant
(A) Sulphur di-oxide
(B) Ozone
(C) PAN
(D) Nitrous oxide
Answer: C

81. Which is the source of chlorofluorocarbons?
(A) Thermal power plants
(B) Automobiles
(C) Refrigeration and Airconditioning
(D) Fertilizers
Answer: C

Chlorofluorocarbons (CFCs) are anthropogenic compounds that have been released into the atmosphere since the 1930s in various applications such as in air-conditioning, refrigeration, blowing agents in foams, insulations and packing materials, propellants in aerosol cans, and as solvents.

82. Which of the following is not a renewable natural resource?
(A) Clean air
(B) Fertile soil

(C) Fresh water
(D) Salt
Answer: D
Salt, or sodium chloride, is a non-renewable resource. A resource is defined as renewable only if it is self-replenishing. While new salt is being formed by natural processes in the earth, the timescale for that formation is too vast for salt to be considered self-replenishing in terms of human use.
83. Which of the following parameters is not used as a pollution indicator in water?
(A) Total dissolved solids
(B) Coliform count
(C) Dissolved oxygen
(D) Density
Answer: D
Some of the chemical indicators commonly used to describe and assess water quality, including:

- Temperature and dissolved oxygen
- Conventional variables (pH, total dissolved solids, conductivity, and suspended sediment)
- Nutrients
- Metals
- Hydrocarbons
- Industrial Chemicals (PCBs and dioxins/furans)
- Test of water contamination in which the number of the colonies of coliform-bacteria Escherichia coli (E. coli) per 100 milliliter of water is counted. The result is expressed as 'Coliform Microbial Density' and indicates the extent of fecal matter present in it.

84. S and P waves are associated with
(A) floods
(B) wind energy
(C) earthquakes
(D) tidal energy
Answer: C
Earthquakes generate three types of seismic waves: P (primary) waves, S (secondary) waves and surface waves, which arrive at seismic recording stations one after another. Both P and S waves penetrate the interior of the Earth while surface waves do not. Due to this, P and S waves are known as "body waves".
SURFACE WAVES:
Travelling only through the crust, surface waves are of a lower frequency than body waves, and are easily distinguished on a seismogram as a result. Though they arrive after body waves, it is surface waves that are almost enitrely responsible for the damage and destruction associated with earthquakes. This damage and the strength of the surface waves are reduced in deeper earthquakes.
1 LOVE WAVES
The first kind of surface wave is called a Love wave, named after A.E.H. Love, a British mathematician who worked out the mathematical model for this kind of wave in 1911. It's the fastest surface wave and moves the ground from side-to-side.
2 RAYLEIGH WAVES
The other kind of surface wave is the Rayleigh wave, named for John William Strutt, Lord Rayleigh, who mathematically predicted the existence of this kind of wave in 1885. A Rayleigh wave rolls along the ground just like a wave rolls across a lake or an ocean. Because it rolls, it moves the ground up and down, and side-to-side in the same direction that the wave is moving.
85. Match Lists I and II and select the correct answer from the codes given below:

List – I	**List – II**
(i) Ozone hole	(a) Tsunami
(ii) Greenhouse effect	(b) UV radiations
(iii) Natural hazards	(c) Methane
(iv) Sustainable development	(d) Eco-centrism

Codes:

	(i)	(ii)	(iii)	(iv)
(A)	(b)	(c)	(a)	(d)
(B)	(c)	(b)	(a)	(d)
(C)	(d)	(c)	(a)	(b)
(D)	(d)	(b)	(c)	(a)

Answer: A
86. Which of the following is a source of methane?
(A) Wetlands
(B) Foam Industry
(C) Thermal Power Plants
(D) Cement Industry
Answer: A

Methane is emitted by natural sources such as wetlands, as well as human activities such as leakage from natural gas systems and the raising of livestock. Natural processes in soil and chemical reactions in the atmosphere help remove CH4 from the atmosphere.

87. 'Minamata disaster' in Japan was caused by pollution due to

(A) Lead
(B) Mercury
(C) Cadmium
(D) Zinc

Answer: B

Minamata disease was first discovered in Minamata city in Kumamoto prefecture, Japan, in 1956. It was caused by the release of methylmercury in the industrial wastewater from the Chisso Corporation's chemical factory, which continued from 1932 to 1968. This highly toxic chemical bioaccumulated in shellfish and fish in Minamata Bay and the Shiranui Sea, which, when eaten by the local populace, resulted in mercury poisoning.

88. Biomagnification means increase in the

(A) concentration of pollutants in living organisms
(B) number of species
(C) size of living organisms
(D) biomass

Answer: A

89. Nagoya Protocol is related to

(A) Climate change
(B) Ozone depletion
(C) Hazardous waste
(D) Biodiversity

Answer: D

The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, also known as the Nagoya Protocol on Access and Benefit Sharing (ABS) is a 2010 supplementary agreement to the 1992 Convention on Biological Diversity (CBD).

90. The second most important source after fossil fuels contributing to India's energy needs is

(A) Solar energy
(B) Nuclear energy
(C) Hydropower
(D) Wind energy

Answer: C

91. In case of earthquakes, an increase of magnitude 1 on Richter scale implies

(A) a ten-fold increase in the amplitude of seismic waves.
(B) a ten-fold increase in the energy of the seismic waves.
(C) two-fold increase in the amplitude of seismic waves.
(D) two-fold increase in the energy of seismic waves.

Answer: A

92. Which of the following is not a measure of Human Development Index?

(A) Literacy Rate
(B) Gross Enrolment
(C) Sex Ratio
(D) Life Expectancy

Answer: C

93. The phrase "tragedy of commons" is in the context of

(A) Tragic even related to damage caused by release of poisonous gases.
(B) Tragic conditions of poor people.
(C) Degradation of renewable free access resources.
(D) Climate change.

Answer: C

The biologist Geratt Hardin called the degradation of renewable free access resources as the tragedy of commons. The tragedy of the commons is an economic theory of a situation within a shared-resource system where individual users acting independently according to their own self-interest behave contrary to the common good of all users by depleting or spoiling that resource through their collective action.

The tragedy of the commons is an economic problem in which every individual tries to reap the greatest benefit from a given resource. As the demand for the resource overwhelms the supply, every individual who consumes an additional unit directly harms others who can no longer enjoy the benefits. Generally, the resource of interest is easily available to all individuals; the tragedy of the commons occurs when individuals neglect the well-being of society in the pursuit of personal gain.

94. Kyoto Protocol is related to

(A) Ozone depletion

(B) Hazardous waste
(C) Climate change
(D) Nuclear energy
Answer: C

95. Which of the following is a source of emissions leading to the eventual formation of surface ozone as a pollutant?
(A) Transport sector
(B) Refrigeration and Air-conditioning
(C) Wetlands
(D) Fertilizers
Answer: A

96. The smog in cities in Indian mainly consists of
(A) Oxides of sulphur
(B) Oxides of nitrogen and unburnt hydrocarbons
(C) Carbon monoxide and SPM
(D) Oxides of sulphur and ozone
Answer: B

97. Which of the following types of natural hazards have the highest potential to cause damage to humans?
(A) Earthquakes
(B) Forest fires
(C) Volcanic eruptions
(D) Droughts and Floods
Answer: D

98. The percentage share of renewable energy sources in the power production in India is around
(A) 2-3%
(B) 22-25%
(C) 10-12%
(D) < 1%
Answer C

99. By the year 2022, the Climate Change Action Plan of Government of India aims at installing
(A) 20,000 MW of wind power
(B) 25,000 MW of wind power
(C) 20,000 MW of solar power
(D) 10,000 MW of solar power
Answer: C

Energy Supply is dealt with through the National Solar Mission, which aims to make solar electricity cost-competitive with coal power and increase the share of solar energy in the energy mix by developing new solar technologies, both photo voltaic and solar thermal. The Mission recommends implementation in three stages, leading to an installed capacity of 20,000 MW by the end of the 13th Five-Year Plan in 2022.

100. Which one of the following biosphere reserves has UNESCO recognition?
(A) Manas
(B) Kanchenjunga
(C) Seshachalam Hills
(D) Greater Nicobar
Answer: D

The Great Nicobar Biosphere Island Reserve, whose tropical wet evergreen forest hosts a wealth of animal species and medicinal plants, joins a global list of places named by UNESCO for promoting sustainable development based on local community efforts and science.

The International Coordinating Council of Man and the Biosphere Programme (MAB-ICC) under the United Nations Organisation for Education, Science and Culture designated the 103,870 hectares Great Nicobar Reserve as protected, in its meeting in Paris, this week, according to a statement released by the body

101. Which activity contributes to water pollution more than any other throughout world?
(A) Agriculture
(B) Hydroelectric power generation
(C) Industry
(D) Urbanisation
Answer: A

Agricultural nonpoint source (NPS) pollution is the leading source of water quality impacts to rivers and lakes.

Nitrogen from fertilizers, manure, waste and ammonia turns into nitrite and nitrate.sediment runoff in the ocean High levels of these toxins deplete waters of oxygen, killing all of the animals and fish.

Nitrates also soak into the ground and end up in drinking water. Health problems can occur as a result of this and they contribute to methemeglopbinemia or blue baby syndrome which causes death in infants.

Ammonia, pesticides as well as oil, degreasing agents, metals and other toxins from farm equipment harm and kill aquatic life and animals and cause health problems when they get into drinking water. Bacteria and parasites from animal waste can get into drinking water which can cause illness and death.

102. Match List – I with List – II and find the correct answer from the codes given below:

List – I (Biosphere Reserve)	List – II (Area of Location)
a. Nilgiri	i. Deccan Peninsula
b. Manas	ii. Chhattisgarh
c. Similipal	iii. Eastern Himalaya
d. Achankmar- Amarkantak	iv. Western Ghat

Codes :

	a	b	c	d
(A)	i	ii	iii	iv
(B)	ii	iii	iv	i
(C)	iii	iv	ii	i
(D)	iv	iii	i	ii

Answer: D

The Nilgiri (Blue Mountains), form part of the Western Ghats in western Tamil Nadu, Karnataka and Kerala states in Southern India. Manas National Park or Manas Wildlife Sanctuary is a national park, UNESCO Natural World Heritage site, a Project Tiger reserve, an elephant reserve and a biosphere reserve in Assam, India.

Simlipal National Park is a national park and a tiger reserve in the Mayurbhanj district in the ... Government of India declared Simlipal as a biosphere reserve in 1994. This reserve is part of the UNESCO World Network of Biosphere Reserves since 2009. The Achanakmar Wildlife Sanctuary is an Indian sanctuary in Mungeli district, Chhattisgarh State. It had been established in 1975, under the provisions of the Indian Wildlife Protection Act of 1972, and declared a Tiger Reserve under Project Tiger, in 2009. It is a part of the Achanakmar-Amarkantak Biosphere Reserve.

103. G5 are the five most important emerging economies of world. Which one of the following does not form part of G5?

(A) Mexico
(B) Brazil
(C) China
(D) Korea

Answer: D

In the 21st century, the G5 were understood to be the five largest emerging economies, and these are:
Brazil.
China.
India.
Mexico.
South Africa.

104. Which of the following nations has the maximum per capita emissions of carbon di-oxide?

(A) China
(B) Japan
(C) USA
(D) India

Answer: C

The world's countries contribute different amounts of heat-trapping gases to the atmosphere. The table below shows data compiled by the Energy Information Agency (Department of Energy), which estimates carbon dioxide emissions from all sources of fossil fuel burning and consumption. Here we list the 20 countries with the highest carbon dioxide emissions (data are for 2011, the most recent year available).

2011 Total Emissions Country Rank	Country	2011 Total Carbon Dioxide Emissions from the Consumption of Energy (Million Metric Tons)	2011 Per Capita Carbon Dioxide Emissions from the Consumption of Energy (Metric Tons of Carbon Dioxide per Person)
1.	China	8715.31	6.52
2.	United States	5490.63	17.62
3.	Russia	1788.14	12.55
4.	India	1725.76	1.45
5.	Japan	1180.62	9.26
6.	Germany	748.49	9.19
7.	Iran	624.86	8.02
8.	South Korea	610.95	12.53
9.	Canada	552.56	16.24

10.	Saudi Arabia	513.53	19.65
11.	United Kingdom	496.80	7.92
12.	Brazil	475.41	2.41
13.	Mexico	462.29	4.07
14.	South Africa	461.57	9.42
15.	Indonesia	426.79	1.73
16.	Italy	400.94	6.57
17.	Australia	392.29	18.02
18.	France	374.33	5.73
19.	Spain	318.64	6.82
20.	Poland	307.91	8.01

105. The world population growth rate at a certain reference year was 3.5%. Assuming exponential growth of population, after how many years, the population of the world would have increased by a factor 16?
(A) ~ 80 years
(B) ~ 40 years
(C) ~ 160 years
(D) ~ 320 years
Answer: A
106. Arrange the following books in chronological order in which they appeared. Use the code given below:
(i) Limits to Growth
ii) Silent Spring
(iii) Our Common Future
(iv) Resourceful Earth
Codes:
(A) (i), (iii), (iv), (ii)
(B) (ii), (iii), (i), (iv)
(C) (ii), (i), (iii), (iv)
(D) (i), (ii), (iii), (iv)
Answer: C
Ans. should be (ii), (i), (iv), (iii)
Silent Spring is an environmental science book by Rachel Carson. The book was published on 27 September 1962
The Limits to Growth is a 1972 book about the computer simulation of exponential economic and population growth with finite resource supplies. Funded by the Volkswagen Foundation and commissioned by the Club of Rome, it was first presented at the St. Gallen Symposium. Our Common Future, also known as the Brundtland Report, from the United Nations World Commission on Environment and Development (WCED) was published in 1987. Its targets were multilateralism and interdependence of nations in the search for a sustainable development path 1984 book The Resourceful Earth (Julian Lincoln Simon co-edited by Herman Kahn), is a similar criticism of the conventional wisdom on population growth and resource consumption and a direct response to the Global 2000 report
107. Which one of the following continents is at a greater risk of desertification?
(A) Africa
(B) Asia
(C) South America
(D) North America
Answer: A
Desertification is a serious problem in the continent. It has been estimated that 319 million hectares of Africa are vulnerable to desertification hazards due to sand movement. An FAO/UNEP assessment of land degradation in Africa suggests that large areas of countries north of the equator suffer from serious desertification problems. For example, the desert is said to be moving at an annual rate of 5 km in the semi-arid areas of West Africa.
Desertification, of course, did not begin with the recent drought. Archaeological records suggest that Africa's arid areas have been getting progressively drier over the past 5 000 years What is new is the coincidence of drought with the increasing pressures put on fragile arid and semi-arid lands by mounting numbers of people and livestock. This is basically what is accelerating land degradation throughout much of Africa. In the wetter areas, however, there is a better chance that degradation can be halted and the land restored.
108. "Women are closer to nature than men." What kind of perspective is this?
(A) Realist
(B) Essentialist
(C) Feminist

(D) Deep ecology

Answer: B

Essentialism is the idea that people and things have 'natural' characteristics that are inherent and unchanging, Most children, when asked if rabbits who have been raised by monkeys are more likely to eat carrots or bananas, will usually answer carrots. They believe not only do rabbits eat carrots, but that they can't help but be carrot-eaters. Realist perspective awareness or acceptance of the physical universe, events, etc, as they are, as opposed to the abstract or ideal awareness or acceptance of the facts and necessities of life; a practical rather than a moral or dogmatic view of things

109. Which one of the following is not a matter a global concern in the removal of tropical forests?

(A) Their ability to absorb the chemicals that contribute to depletion of ozone layer.

(B) Their role in maintaining the oxygen and carbon balance of the earth.

(C) Their ability to regulate surface and air temperatures, moisture content and reflectivity.

(D) Their contribution to the biological diversity of the planet.

Answer: A

110. The most comprehensive approach to address the problems of man-environment interaction is one of the following:

(A) Natural Resource Conservation Approach

(B) Urban-industrial Growth Oriented Approach

(C) Rural-agricultural Growth Oriented Approach

(D) Watershed Development Approach

Answer: D is given but answer should be A

111. The major source of the pollutant gas, carbon mono-oxide (CO), in urban areas is

(A) Thermal power sector

(B) Transport sector

(C) Industrial sector

(D) Domestic sector

Answer: B

Carbon monoxide is a temporary atmospheric pollutant in some urban areas, chiefly from the exhaust of internal combustion engines (including vehicles, portable and back-up generators, lawn mowers, power washers, etc.). Therefore, transport ssector is the major contributor to CO pollution.

112. In a fuel cell driven vehicle, the energy is obtained from the combustion of

(A) Methane

(B) Hydrogen

(C) LPG

(D) CNG

Answer: B

113. The population of India is about 1.2 billion. Take the average consumption of energy per person per year in India as 30 Mega Joules. If this consumption is met by carbon based fuels and the rate of carbon emissions per kilojoule is l5 x $I0^6$ kgs, the total carbon emissions per year from India will be

(A) 54 million metric tons

(B) 540 million metric tons

(C) 5400 million metric tons

(D) 2400 million metric tons

Answer: B

1.2 billion=1.2×10^9

30 megajl=30×10^3 kgj

so total

=$1.2\times10^9\times30\times10^3\times15\times10^6$

=540×10^{18} kgj

1 million metric ton=10^9kg (million=10^6, metric ton= 10^3 called tonne)

so ans=$540\times10^{18}/10^9$

=540×10^9 metric tons

114. Which of the following cities has been worst affected by urban smog in recent times?

(A) Paris

(B) London

(C) Los Angeles

(D) Beijing

Answer: D

115. The primary source of organic pollution in fresh water bodies is

(A) run-off urban areas

(B) run-off from agricultural forms

(C) sewage effluents

(D) industrial effluents

Answer: C

116. 'Lahar' is a natural disaster involving

(A) eruption of large amount of material
(B) strong winds
(C) strong water waves
(D) strong wind and water waves

Answer: A

Lahars have several possible causes:

- Snow and glaciers can be melted by lava or pyroclastic flows during an eruption.
- Lava flows out of open vents and can mix with wet soil and mud on the slope of the volcano making a very viscous, high energy lahar. (The higher up the slope of the volcano the more gravitational potential energy the flow will have.)
- A flood caused by a glacier, lake breakout, or heavy rainfall can release a lahar, also called glacier run or jökulhlaup
- Water from a crater lake, combined with volcanic material in an eruption.
- Heavy rainfall on unconsolidated pyroclastic deposits.
- Volcanic landslides.

117. In order to avoid catastrophic consequences of climate change, there is general agreement among the countries of the world to limit the rise in average surface temperature of earth compared to that of pre-industrial times by

(A) 1.5 oC to 2 oC
(B) 2.0 oC to 3.5 oC
(C) 0.5 oC to 1.0 oC
(D) 0.25 oC to 0.5 oC

Answer: A

Countries usually agree to limit the temperature rise to 1.5 to 2 degree Celsius as compared to pre-industrial times.

118. The National Disaster Management Authority functions under the Union Ministry of

(A) Environment
(B) Water Resources
(C) Home Affairs
(D) Defence

Answer: C

National Disaster Management Authority, abbreviated as NDMA is an agency of the Ministry of Home Affairs whose primary purpose is to coordinate response to natural or man-made disasters and for capacity-building in disaster resiliency and crisis response

119. Match List - I and List - II and select the correct answer from the codes given below:

List – I	**List - II**
(a) Flood	(1) Lack of rainfall of sufficient duration
(b) Drought	(2) Tremors produced by the passage of vibratory waves through the rocks of the earth
(c) Earthquake	(3) A vent through which molted substances come out
(d) Valcano	(4) Excess rain and uneven distribution of water

Codes:

	(a)	(b)	(c)	(d)
(A)	4	1	2	3
(B)	2	3	4	1
(C)	3	4	2	1
(D)	4	3	1	2

Answer: A

120. Which one of the following green house gases has the shortest residence time in the atmosphere?

(A) Chlorofluorocarbon
(B) Carbon dioxide
(C) Methane
(D) Nitrous oxide

Answer: C

Atmospheric Lifetime of Different Greenhouse Gases

Carbon dioxide	CO2	5-200
Methane	CH4	12
Nitrous oxide	N2O	114
Carbon tetrachloride	CCl4	26

121. Consider the following statements and select the correct answer from the code given below:

(i) Rajasthan receives the highest solar radiation in the country.
(ii) India has the fifth largest installed wind power in the world.
(iii) The maximum amount of wind power is contributed by Tamil Nadu.
(iv) The primary source of uranium in India is Jaduguda.
(A) (i) and (ii)

(B) (i), (ii) and (iii)
(C) (ii) and (iii)
(D) (i) and (iv)

Answer: D

Wind power generation capacity in India has significantly increased in recent years. As of the end of July 2017 the total installed wind power capacity was 32.56 GW, mainly spread across the South, West and North regions. By the end of 2015, India had the fourth largest installed wind power capacity in the world.The levelised tariff of wind power reached a record low of □2.64 (4.1¢ US) per kWh (without any direct or indirect subsidies) during auctions for wind projects in

122. In terms of total CO_2 emissions from a country, identity the correct sequence:

(A) U.S.A. > China > India > Russia
(B) China > U.S.A. > India > Russia
(C) China > U.S.A. > Russia > India
(D) U.S.A. > China > Russia > India

Answer: B

On pure emissions alone, the key points are:

• China emits more CO2 than the US and Canada put together - up by 171% since the year 2000
• The US has had declining CO2 for two years running, the last time the US had declining CO2 for 3 years running was in the 1980s
• The UK is down one place to tenth on the list, 8% on the year. The country is now behind Iran, South Korea, Japan and Germany
• India is now the world's third biggest emitter of CO2 - pushing Russia into fourth place
• The biggest decrease from 2008-2009 is Ukraine - down 28%. The biggest increase is the Cook Islands - up 66.7%

123. Match List – I and List – II and identify the correct code:

a. World Health Day	i.16th September
b. World Population Day	ii. 1st December
c. World Ozone Day	iii. 11th July
d. World AIDS Day	iv. 7th April

Codes:

	a	b	c	d
(A)	i	ii	iii	iv
(B)	iv	iii	i	ii
(C)	ii	iii	iv	i
(D)	iii	iv	ii	i

Answer: B

124. Which of the anthropogenic activity accounts for more than 2/3rd of global water consumption?

(A) Agriculture
(B) Hydropower generation
(C) Industry
(D) Domestic and Municipal usage

Answer: A

Anthropogenic: caused or produced by humans

125. One of the anthropogenic sources of gaseous pollutants chlorofluorocarbons (CFCs) in air is

(A) Cement Industry
(B) Fertiliser industry
(C) Foam industry
(D) Pesticide industry

Answer: C

126. The cyclone "Hudhud" hit the coast of which State?

(A) Andhra Pradesh
(B) Karnataka
(C) Kerala
(D) Gujarat

Answer: A

Extremely Severe Cyclonic Storm Hudhud was a strong tropical cyclone that caused extensive damage and loss of life in eastern India and Nepal during October 2014.

127. Which of the following is not a renewable natural resource?

(A) Clean air
(B) Fresh water
(C) Fertile soil
(D) Salt

Answer D

128. In which of the countries per capita use of water is maximum

(A) USA
(B) European Union
(C) China
(D) India
Answer: A
129. India's contribution to total global carbon dioxide emissions is about
(A) ~ 3 PERC
(B) ~ 6 PERC
(C) ~ 10 PERC
(D) ~ 15 PERC
Answer: B
Current CO2 emissions
The simplest and most common way to compare the emissions of countries is to add up all the fossil fuels burned and cement produced in each nation and convert that into CO2. According to 2011 data compiled by the Netherlands Environmental Assessment Agency, the top 10 emitters by this measure are:
1. China: 9697 million tonnes (MT) or 28.6%
2. US: 5420 MT or 16.0%
3. India: 1967 MT or 5.8%
4. Russia: 1829 MT or 5.4%
5. Japan: 1243 MT or 3.7%
6. Germany: 810 MT 2.4%
7. South Korea: 609 MT or 1.7%
8. Canada: 555 MT or 1.6%
9. Indonesia: 490 MT or 1.4%
10. Saudi Arabia: 464 MT or 1.4%
130. Two earthquakes A and B happen to be of magnitude 5 and 6 respectively on Richter Scale. The ratio of the energies released EB/EA will be approximately
(A) ~ 8
(B) ~ 16
(C) ~ 32
(D) ~ 64
Answer: C
131. Which of the following combinations represent renewable natural resources
(A) Fertile soil, fresh water and natural gas
(B) Clean air, phosphates and biological diversity
(C) Fishes, fertile soil and fresh water
(D) Oil, forests and tides
Answer: A
132. In the recently launched Air Quality Index in India, which of the following pollutants is not included
(A) Carbon monoxide
(B) Fine particulate matter
(C) Ozone
(D) Chlorofluorocarbons
Answer: D
133. The factors which are most important in determining the impact of anthropogenic activities on environment are
(A) Population, affluence per person, land available per person are
(B) Population, affluence per person and the technology used for exploiting resources
(C) Atmospheric conditions, population and forest cover
(D) Population, forest cover and land available per person
Answer: C

UNIT – 10

HIGHER EDUCATION SYSTEM: GOVERNANCE, POLITY & ADMINISTRATION

UNIT 10: HIGHER EDUCATION SYSTEM: GOVERNANCE, POLITY & ADMINISTRATION

CONTENTS:

- Introduction of Indian constitution
- Idea of Indian Constitution
- Important Details of Indian Constitution & Various sources of our Constitution
- Details of President Roles & Responsibility
- Details of Vice-President Roles & Responsibility
- Details of Prime-minister
- Articles in Our Constitution
- Fundamental rights and duties
- Apex bodies like election commission and state governing bodies
- Parliament
- Understanding of organization and governance in higher education.(Different type of college and universities)
- Various institutions of higher education.
- Higher education governance, administration, and educational politics.(NEW EDUCATION POLICY)
- Specific organizational policy goals and implementation(UGC,NAAC,AICTE)
- Changing organizations and systems.
- Previous Year Solved Questions

INTRODUCTION OF INDIAN CONSTITUTION

The Constitution of India is the supreme law of India. It lays down the framework defining fundamental political principles, establishes the structure, procedures, powers and duties of government institutions and sets out fundamental rights, directive principles and the duties of citizens. It is the longest written constitution of any sovereign country in the world. The nation is governed on the basis of this Constitution. B. R. Ambedkar is regarded as the chief architect of the Indian Constitution.

At the time of independence in August 15th 1947, the State of Jammu and Kashmir decided not to join either India or Pakistan. However, soon Pakistan attempted to annex the State military. Meanwhile, the Maharaja signed the "Instrument of accession" with India along with certain concessions for the autonomy of the State. Article 370 in Part XXI of the Indian Constitution grants a special status to Jammu and Kashmir

The Indian constitution is the world's longest constitution. At the time of commencement, the constitution had 395 articles in 22 parts and 8 schedules. It consists of almost 80,000 words. The Constitution, in its current form (September 2012), consists of a preamble, 25 parts containing 448 articles, 12 schedules, 5 appendices and 100 amendments, the latest of which came into force on 1 August 2015

EVOLUTION OF INDIAN CONSTITUTION

The **idea of a Constituent** Assembly to frame the Constitution of India was first mooted by the Communist leader MN Roy. The Indian National Congress (INC) demanded a Constituent Assembly for the first time in 1935. The British Government accepted the demand in its "August Offer" in 1940. The Cripps Mission in 1942 came to India with a draft proposal but the Muslim League didn't accept it as it wanted the division of India. Finally, the Cabinet Mission came out with a compromise formula which constituted the Constituent Assembly in November, 1946.

The first meeting of the Constituent Assembly was convened on December 9, 1946 with Sachchidanand Sinha as the Interim President. He was the oldest member of the assembly. On December 11 , 1946, Dr Rajendra Prasad was elected as Permanent President of the Constituion Assembly. The Muslim League boycotted the meeting and insisted on a separate state of Pakistan.

On December 13, 1946, Jawaharlal Nehru moved the historic 'Objectives Resolution' in the Assembly. It pledged to make India an independent sovereign union of states. Sir B.N. Rao was appointed as the Constitutional Advisor to the Assembly.

VARIOUS SOURCES OF OUR CONSTITUTION

1. **Government of India Act of 1935** – Federal Scheme, Office of Governor, Judiciary, Public Service Commission, Emergency provisions and administrative details.
2. **British Constitution** – Parliamentary System, Rule of law, Lagislative Procedure, Single Citizenship, Cabinet System, Prerogative Writs, Parliamentary Privileges and Bicameralism.
3. **US Constitution** – Fundamental rights, independence of judiciary, judicial review, impeachment of president, removal of Supreme court and high court judges and post of vice president.
4. **Irish Constitution**– Directive Principles of State Policy, nomination of members of Rajya Sabha and method of election of president
5. **Canadian Constitution**– Federation with a strong centre, vesting of residuary power in the centre, appointment of state Governor by the centre and advisory jurisdiction of Supreme Court.
6. **Australian Constitution**– Concurrent list, joint sitting of two houses of Parliament.
7. **Constitution of Germany**– Suspension of fundamental rights during emergency.
8. **French Constitution**– Republic and ideals of liberty, equality and fraternity in the Preamble.
9. **South African Constitution-** Procedure for amendment of the constitution and election of members of Rajya Sabha.
10. **Japanese Constitution-** Procedure established by Law.
11. **Constitution of former USSR:** Procedure of five-year plan, fundamental duties, ideals of justice in Preamble.

PREAMBLE TO THE CONSTITUTION

The Constitution begins with the Preamble. The objective resolution proposed by Pt. Nehru ultimately became the preamble. It contains the summary or essence of the Constitution. It has been amended by the 42nd Constitutional Amendment Act (1976), which added three new words - ***Socialist, secular and integrity.***

> ***"We, THE PEOPLE Of INDIA, having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens: JUSTICE, Social, Economic and Political; LIBERTY of thought, expression, belief, faith and worship; EQUALITY of status and of opportunity; and to promote among them all; FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation; IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION"***

Important part of the Indian Constitution

Part I	The Union and its Territory	Article [1 to 4]
Part II	Citizenship	Article [5 to 11]
Part III	Fundamental Rights	Article [12 to 35]
Part IV	Directive Principles of State Policy	Article [36 to 51]
Part V(a)	Fundamental Duties	Article [51(a)]
Part V	The Union Executive	Article [52 to 151]
Part VI	The State Executive	Article [152 to 237]
Part XVIII	Emergency Provisions	Article [352 to 360]
Part XX	Constitution Amendments	Article [368]

PRESIDENT

Articles 52 to 153 of the Constitution deal with the Union executive. The Union executive consists of the President, the Vice-President, the Prime Minister, the council of ministers and the attorney general of India. The President is the head of the Indian State. He is the first citizen of India.

Impeachment of President: The President can be removed from office by a process of impeachment for 'violation of the Constitution'. The impeachment charges can be initiated by either House of Parliament. These charges should be signed by one-fourth members of the House (that framed the charges), and a 14 days' notice should be given to the President.

The executive powers and functions of the President are:

- All executive actions of the Government of India are formally taken in his name.
- According to article 75 he appoints the Prime Minister of India and according to Article 77 with consent of the Prime Minister he appoints the other ministers. They hold office during his pleasure.
- He appoints the Attorney-General of India, the Comptroller and Auditor General of India, the Chief Election Commissioner and other Election Commissioners, the chairman and members of the Union Public Service Commission, the governors of states, the chairman and members of Finance Commission, and administrators of UTs and so on.

Legislative powers

The President is an integral part of the Parliament of India, and enjoys the following legislative powers.

1. He can summon or prorogue the Parliament and dissolve the Lok Sabha. [Art. 85]
2. He can also summon a joint sitting of both the Houses of Parliament, which is presided over by the Speaker of the Lok Sabha. [Art. 108]
3. He can address the Parliament at the commencement of the first session after each general election and the first session of each year. [Art. 87]
4. 4. He can send messages to the Houses of Parliament, whether with respect to a bill pending in the Parliament or otherwise.
5. He can appoint any member of the Lok Sabha to preside over its proceedings when the offices of both the Speaker and the Deputy Speaker fall vacant. Similarly, he can also appoint any member of the Rajya Sabha to preside over its proceedings when the offices of both the Chairman and the Deputy Chairman fall vacant.
6. He nominates 12 members of the Rajya Sabha from amongst persons having special knowledge or practical experience in literature, science, art and social service. [Art. 80(1)]
7. The President is empowered to nominate not more than two Anglo-Indian members to the Lok Sabha, if that community is not adequately represented in that House. [Art. 331]
8. His prior recommendation or permission is needed to introduce certain types of bill in the Parliament. For example, a bill involving expenditure from the Consolidated Fund of India, or a bill for the alteration of boundaries of states or creation of a new state.
9. When a bill is sent to the President after it has been passed by the Parliament, he can give his assent, withhold his assent or return the bill for reconsideration of the parliament. However, if the bill is passed again by the Parliament, with or without amendments, the President has to give his assent to the bill.
10. When a bill passed by a state legislature is reserved by the governor for consideration of the President, the President can give his assent, withhold it or direct the governor to return the bill (if it is not a money bill) for reconsideration of the state legislature. It

should be noted here that it is not obligatory for the President to give his assent even if the bill is again passed by the state legislature and sent again to him for his consideration.

11. According to Article 123, he can promulgate ordinances when the Parliament is not in session. An ordinance issued under Art. 123 must receive approval of Parliament (both the houses) within six weeks of reassembly of the parliament.

Veto power of the President:

A bill passed by the Parliament can become an act only if it receives the assent of the President. However, the President has the veto power over the bills passed by the Parliament, i.e. he can withhold his assent to the bills.

Absolute Veto: It refers to the power of the President to withhold his assent to a bill passed by the Parliament. The bill then ends and does not become an act. Usually, this veto is exercised in the following two cases: With respect to private members' bills; and With respect to the government bills when the cabinet resigns (after the passage of the bills but before the assent by the President) and the new cabinet advises the President not to give his assent to such bills.

Suspensive Veto: The President exercises this veto when he returns a bill for reconsideration of the Parliament. However, if the bill is passed again by the Parliament with or without amendments and again presented to the President, it is obligatory for the President to give his assent to the bill. The President does not possess this veto in the case of money bills.

VICE-PRESIDENT

The Vice-President occupies the second highest office in the country. He is accorded a rank next to the President in the official warrant of precedence. Election He is elected by the members of an electoral college consisting of the members of both Houses of Parliament.

Thus, this electoral college is different from the electoral college for the election of the President in the following two respects:

- It consists of both elected and nominated members of the Parliament.
- It does not include the members of the state legislative assemblies.

The Vice-President's election, like that of the President's election, is held in accordance with the system of proportional representation by means of the single transferable vote and the voting is by secret ballot.

Qualifications

To be eligible for election as Vice-President, a person should fulfil the following qualifications:

- He should be a citizen of India.
- He should have completed 35 years of age.
- He should be qualified for election as a member of the Rajya Sabha.
- He should not hold any office of profit under the Union government or any state government or any local authority or any other public authority. ***Oath or affirmation***

The oath of office to the Vice-President is administered by the President or some person appointed in that behalf by him.

Term of office

The Vice-President holds office for a term of five years from the date on which he enters upon his office. However, he can resign from his office at any time by addressing the resignation letter to the President. He can also be removed from the office before completion of his term. A formal impeachment is not required for his removal. He can be removed by a resolution of the Rajya Sabha passed by an absolute majority.

O n the vacancy of the post of the Vice-President, whether by death, resignation or otherwise, the Deputy Chairman of the Rajya Sabha takes charge until a Vice-President is elected and takes charge.

Powers and functions

The functions of Vice-President are twofold:

1. He acts as the ex-officio Chairman of Rajya Sabha. In this capacity, his powers and functions are similar to those of the Speaker of Lok Sabha.
2. He acts as President when a vacancy occurs in the office of the President due to his resignation, removal, death or otherwise. He can act as President only for a maximum period of six months, within which a new President has to be elected. Further, when the sitting President is unable to discharge his functions due to absence, illness or any other cause, the Vice-President discharges his functions until the President resumes his office.
3. While acting as President or discharging the functions of President, the Vice-President does not perform the duties of the office of the chairman of Rajya Sabha. During this period, those duties are performed by the Deputy Chairman of Rajya Sabha. If the offices of both the President and the Vice-President fall vacant by reason of death, resignation, and removal etc the Chief Justice of India or in his absence the seniormost judge of the Supreme Court acts as President.

For the first time, during the 15-day visit of Dr. Rajendra Prasad to the Soviet Union in June 1960, the then Vice- President Dr. Radhakrishnan acted as the President. For the first time, in 1969, when the President Dr. Zakir Hussain died and the Vice-President V.V. Giri resigned, the Chief Justice Md. Hidayatullah acted as President.

PRIME MINISTER

In the scheme of parliamentary system of government provided by the Constitution, the President is the nominal executive authority and Prime Minister is the real executive authority. The President is the head of the State while Prime Minister is the head of the government.

Appointment of the Prime Minister Article 75 says that the Prime Minister shall be appointed by the President. The President appoints the leader of the majority party in the Lok Sabha as the Prime Minister. But, when no party has a clear majority in the Lok Sabha, then the President may exercise his personal discretion in the selection and appointment of the Prime Minister.

Term

The term of the Prime Minister is not fixed and he holds office during the pleasure of the President. So long as the Prime Minister enjoys the majority support in the Lok Sabha, he cannot be dismissed by the President. However, if he loses the confidence of the Lok Sabha, he must resign or the President can dismiss him.

Powers and functions of Prime Minister

The powers and functions of Prime Minister can be studied under the following heads:

- He recommends persons who can be appointed as ministers by the President.
- He can recommend dissolution of the Lok Sabha to the President at any time.
- He is the chairman of the Planning Commission, National Development Council, National Integration Council, Inter-State Council and National Water Resources Council.

CENTRAL COUNCIL OF MINISTERS

As the Constitution of India provides for a parliamentary system of government modelled on the British pattern, the council of ministers headed by the prime minister is the real executive authority is our politico-administrative system.

The principles of parliamentary system of government are not detailed in the Constitution, but two Articles (74 and 75) deal with them in a broad, sketchy and general manner. Article 74 deals with the status of the council of ministers while Article 75 deals with the appointment, tenure, responsibility, qualification, oath and salaries and allowances of the ministers.

CONSTITUTIONAL PROVISION

Article 74

There shall be a Council of Ministers with the Prime Minister at the head to aid and advise the President, who shall, in the exercise of his functions, act in accordance with such advice.

Article 75

The Prime Minister shall be appointed by the Presidentand the other ministers shall be appointed by the President on the advice of the Prime Minister. The total number of ministers, including the Prime Minister, in the Council of Ministers shall not exceed 15% of the total strength of the Lok Sabha. [91st Constitutional Amendment Act, 2003] The council of ministers shall be collectively responsible to the Lok Sabha.

A person who is not a member of either House can also become a minister but he cannot continue as minister for more than six months unless he secures a seat in either House of Parliament (by election/nomination). [Art.75(5)]

The council of ministers consists of three categories: cabinet ministers, ministers of state, and deputy ministers.

- **Cabinet Ministers**: The cabinet ministers head the important ministries of the Central government like home, defence, finance and external affairs.
- **Ministers of State:** The ministers of state can either be given independent charge of ministries/departments or can be attached to cabinet ministers.
- **Deputy Ministers:** The deputy ministers are not given independent charge of ministries/departments and always assist the Cabinet or State Minister or both. They are not members of the cabinet and do not attend cabinet meetings. Minster may be taken from members of either House and minister who is member of one House has the right to speak and take part in the proceedings of the other House but cannot vote in the House of which he is not member. [Art. 88]. If the Prime Minister resigns or passes away, the entire ministry goes out automatically.

Topics to be covered in next part :-

In Next part we will cover following topics. please feel free to reach me in case more information is required.

- Parliament /legislative organ of the Union government.
- State Government
- State Legislature
- The Court: Seats and Jurisdiction
- The High Court: Seats and Jurisdiction
- Union Territories
- Center & Inter-State Relations
- Emergency Provisions
- Special Status of Jammu and Kashmir
- Important Government Bodies

Key Facts:

- The Indian Constitution is the longest in the world
- It has 448 articles, 12 schedules and 98 amendments. On the other hand, the American constitution is the shortest.
- The Constituent Assembly had 284 members, out of which 15 were women. The Drafting Committee submitted the draft in November 1949, after which they took three more years to complete it
- The Constitution of India was handwritten and calligraphed both in English and Hindi.
    - The Indian Constitution has taken various features from other constitutions.
    - The concepts of liberty, equality and fraternity were taken from the French Constitution.
    - The idea of 5 year plans was taken from the USSR and the concept of socio-economic rights was taken from Ireland.
- Most importantly, the law on which the Supreme Court works was taken from Japan. There are many other concepts that have been borrowed from other countries.
- The Indian Constitution came into force on January 26, 1950.

- R. Ambedkar had a major role to play in the formulation of the Indian Constitution.

FUNDAMENTALS RIGHTS AND DUTIES

Classification of Fundamental Rights

Originally Constitution provided for seven Fundamental Rights viz.

- Right to equality (Article 14-18)
- Right to freedom (Article 19-22)
- Right against exploitation (Article 23-24)
- Right to freedom of religion (Articles 25-28)
- Cultural & educational rights (Articles 29-30)
- Right to Property (Article 31)[Later It was removed !!]
- Right to constitutional remedies (Article 32).

At present there are only six Fundamental rights, six fundamental rights are described below in brief.

Right to Equality	• Article 14 :- Equality before law and equal protection of law • Article 15 :- Prohibition of discrimination on grounds only of religion, race, caste, sex or place of birth. • Article 16 :- Equality of opportunity in matters of public employment • Article 17 :- End of untouchability • Article 18 :- Abolition of titles, Military and academic distinctions are, however, exempted
Right to Freedom	• Article 19 :- It guarantees the citizens of India the following six fundamentals freedoms:- 1. Freedom of Speech and Expression 2. Freedom of Assembly 3. Freedom of form Associations 4. Freedom of Movement 5. Freedom of Residence and Settlement 6. Freedom of Profession, Occupation, Trade and Bussiness • Article 20 :- Protection in respect of conviction for offences • Article 21 :- Protection of life and personal liberty • Article 22 :- Protection against arrest and detention in certain cases
Right Against Exploitation	• Article 23 :- Traffic in human beings prohibited • Article 24 :- No child below the age of 14 can be employed
Right to freedom of Religion	• Article 25 :- Freedom of conscience and free profession, practice and propagation of religion • Article 26 :- Freedom to manage religious affairs • Article 27 :- Prohibits taxes on religious grounds • Article 28 :- Freedom as to attendance at religious ceremonies in certain educational institutions
Cultural and Educational Rights	• Article 29 :- Protection of interests of minorities • Article 30 :- Right of minorities to establish and administer educational institutions • Article 31 :- Omitted by the 44th Amendment Act
Right to Constitutional Remedies	• Article 32 :- The right to move the Supreme Court in case of their violation (called Soul and heart of the Constitution by BR Ambedkar) • Forms of Writ check • Habeas Corpus :- Equality before law and equal protection of law

Fundamental Duties in the Indian Constitution

- Fundamental duties in Indian constitution are based on Japanese model. Ten duties in the the Indian Constitution were included in the Indian Constitution by 42nd amendment act, 1976 on the basis of Swarn Singh Committee. Eleventh duty was added by 86th Amendment act, 2002.
- Fundamental rights and fundamental duties are co-relative. 11 Fundamental Duties of the citizens towards the State have been enumerated in Article 51-A in part-IV A of our Constitution.
- There is no provision in the Indian constitution for direct enforcement of any of these duties nor any sanction to prevent their violation.

- supreme Court pointed out the foundation of the "composite culture' expressed in clause (f) of article 51-A in the Sanskrit language and literature.

1. To abide by the Indian Constitution and respect its ideals and institutions, the National Flag and the National Anthem.
2. To cherish and follow the noble ideals of the freedom struggle.
3. To uphold and protect the sovereignty, unity and integrity of India.
4. To defend the country and render national service when required.
5. To promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities, to renounce practices derogatory to the dignity of women.
6. To value and preserve the rich heritage of our composite culture.
7. To protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures.
8. To develop the scientific temper, humanism and the spirit of inquiry and reform.
9. To safeguard public property and to abjure violence.
10. To strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement.
11. Who is a parent or guardian to provide opportunities for education to his child or ward, as the case may be, between the age of six and fourteen years.

List of fundamental duties for citizens

APEX BODIES

- The **Comptroller and Auditor General (CAG) of India** is an authority, established by the Constitution under **Constitution of India/Part V – Chapter V/Sub-part 7B/Article 148**, who audits all receipts and expenditure of the Government of India and the state governments, including those of bodies and authorities substantially financed by the government.
- Auditors to the Nation , The current CAG of India is Shashi Kant Sharma, who was appointed on 23 May 2013. He is the 12th CAG of India.
- The **Chief Justice of India** (**CJI**) is the head of the judiciary of India and the Supreme Court of India.
  - As head of the supreme court, the chief justice is responsible for the allocation of cases and appointment of constitutional benches which deal with important matters of law.
  - The present CJI is Justice T. S. Thakur, and is the 43rd CJI since January 1950
- **Union Public Service Commission**
  - Under Article 320 of the Constitution of India, the Commission is, inter-alia, required to be consulted on all matters relating to recruitment to civil services and posts. The functions of the Commission under Article 320 of the Constitution are:

1. Conduct examinations for appointment to the services of the Union.
2. Direct recruitment by selection through interviews.
3. Appointment of officers on promotion / deputation / absorption.
4. Framing and amendment of Recruitment Rules for various services and posts under the Government.
5. Disciplinary cases relating to different Civil Services.
6. Advising the Government on any matter referred to the Commission by the President of India.

- **Election Commission of India**
  - Deepak Gupta a retired IAS officer of Jharkhand cadre is the Current chairman of the commission.
  - The **Election Commission of India** is an autonomous constitutional authority responsible for administering election processes to Lok Sabha, Rajya Sabha, state legislatures, and the offices of the President and Vice President in India.
  - **General Election System (GENESYS)** is the software used for capturing data from the CEO offices and district centers all over India during Elections.
  - Dr. Nasim Zaidi, assumed charge as 20th Chief Election Commissioner of India on 19.04.15

TOP 10 IMPORTANT GOVERNMENT BODIES YOU MUST KNOW ABOUT ELECTION COMMISSION

The Election Commission is a permanent, independent body established by the Constitution of India directly to ensure free and fair elections in the country. Article 324 of the Constitution provides that the power of superintendence, direction and control of elections to parliament, state legislatures, the office of president of India and the office of vice-president of India shall be vested in the election commission.

- Elections are conducted according to the constitutional provisions supplemented by laws made by Parliament.

- The major laws are Representation of the People Act, 1950, which mainly deals with the preparation and revision of electoral rolls, and the Representation of the People Act, 1951, which deals in detail with all aspects of conduct of elections and past election disputes.
- The electoral system in India in borrowed from the one operating in Great Britain. Presently, the Election Commission consists of one Chief Election Commissioner (CEC) and two Election Commissioners.

Powers and functions

- To determine the territorial areas of the electoral constituencies throughout the country on the basis of the Delimitation Commission Act of Parliament.
- To prepare and periodically revise electoral rolls and to register all eligible voters.
- To notify the dates and schedules of elections and to scrutinise nomination papers.
- To grant recognition to political parties and allot election symbols to them.
- To act as a court for settling disputes related to granting of recognition to political parties and allotment of election symbols to them.
- To determine the code of conduct to be observed by the parties and the candidates at the time of elections.
- To advise the President on matters relating to the disqualification of the members of Parliament.
- To advise the governor on matters relating to the disqualification of the members of state legislature.
- To cancel polls in the event of rigging, booth capturing,violence and other irregularities.
- To register political parties for the purpose of elections and grant them the status of national or state parties on the basis of their poll performance.

Note:

- Since its inception in 1950 and till 15 October 1989, the Election Commission functioned as a single-member body consiting of the Chief Election Commissioner.
- By an ordinance of 1993, the power of Election Commissioners have been made equal to those of the Chief Election Commissioner.
- The Commission works under the overall supervision of the Chief Election Commissioner.
- The tenure of the CEC and the Election Commissioners has been fixed as six years

UNION PUBLIC SERVICE COMMISSION

The first Public Service Commission was set up on October 1st, 1926. However, its limited advisory functions failed to satisfy the people's aspirations and the continued stress on this aspect by the leaders of our freedom movement resulted in the setting up of the Federal Public Service Commission under the Government of India Act 1935.

- The first Public Service Commission was set up on October 1st, 1926. However, its limited advisory functions failed to satisfy the people's aspirations and the continued stress on this aspect by the leaders of our freedom movement resulted in the setting up of the Federal Public Service Commission under the Government of India Act 1935. Under this Act, for the first time, provision was also made for the formation of Public Service Commission's at the provincial level.
- The Constituent Assembly, after independence, saw the need for giving a secure and autonomous status to Public Service Commission's both at Federal and Provincial levels for ensuring unbiased recruitment to Civil Services. With the promulgation of the new Constitution for independent India on 26th January, 1950, the Federal Public Service Commission was accorded a constitutional status as an autonomous entity and given the title – Union Public Service Commission.
- The UPSC has been established under Article 315 of the Constitution of India.
- The Commission consists of a Chairman and ten Members. The chairman and members of the commission hold office for a term of six years or until they attain the age of 65 years, whichever is earlier. It is an independent constitutional body.
- Main function of the UPSC Recruitment to services and posts under the Union through conduct of competitive examinations.

STATE PUBLIC SERVICE COMMISSION

A state public service commission consists of a chairman and other members appointed by the governor of the state. But they can be removed only by the President. It is an independent constitutional body.

- The chairman and members of the commission hold office for a term of six years or until they attain the age of 62 years, whichever is earlier.
- Main function of the SPSC To conduct examinations for appointments to the services of the state.

JOINT STATE PUBLIC SERVICE COMMISSION

The Constitution makes a provision for the establishment of a Joint State Public Service Commission (JSPSC) for two or more states.

- A JSPSC can be created by an act of Parliament on the request of the state legislatures concerned. Thus, a JSPSC is a statutory and not a constitutional body. The chairman of JSPSC is appointed by the President.

FINANCE COMMISSION

Article 280 of the Constitution of India provides for a Finance Commission as a quasi-judicial body. It is constituted by the President of India every fifth year or at such earlier time as he considers necessary.

Composition

The Finance Commission consists of a chairman and four other members to be appointed by the president.

Main functions of Finance Commission

- The distribution of the net proceeds of taxes to be shared between the Centre and the states, and the allocation between the states of the respective shares of such proceeds.
- Determination of the factors that should govern the grants-in-aid to the states by the Centre. The commission submits its report to the President. He lays it before both the Houses of Parliament along with an explanatory memorandum as to the action taken on its recommendations.

COMPTROLLER AND AUDITOR GENERAL OF INDIA (CAG)

The Constitution of India (Article 148) provides for an independent office of the Comptroller and Auditor General of India (CAG).

It is the supreme audit institution of India. He is the head of the Indian Audit and Accounts Department and the guardian of the public purse and controls the entire financial system of the country at both the levels—the Centre and the state.

The reports of the CAG are taken into account by the Public Accounts Committee of Parliament and state legislatures

- The CAG is also the head of the Indian Audits and Accounts Service (IA&AS)
- The office of the CAG was established in 1860
- The first CAG of India was V Narahari Rao (1948-1954)
- The current CAG is Vinod Rai (2008 – present)

Appointment and term

- The CAG is appointed by the President of India. He holds office for a period of six years or up to the age of 65 years, whichever is earlier.
- He can resign any time from his office by addressing the resignation letter to the president. He can also be removed by the President on same grounds and in the same manner as a judge of the Supreme Court.

Main Function

- He Audit the total expenditure of Center & State Govt and he Consolidated Fund of India and consolidated fund of each state.
- He audits all expenditure from the Contingency Fund of India and the Public Account of India as well as the contingency fund of each state and the public account of each state.
- He audits the accounts of any other authority when requested by the President or Governor. For example, the audit of local bodies.

Note: He submits his audit reports relating to the accounts of the Centre to President and relating to the accounts of a state to governor.

ATTORNEY GENERAL OF INDIA

Overview

- The Attorney General is the Union Government's chief legal advisor and is its primary lawyer in the Supreme Court
- The Attorney General is the highest law officer in the country
- The first Attorney General of independent India was M C Setalvad 1950-1963
- The current Attorney General is G E Vahanvati (2009 – present)

Terms of service

- The Attorney General is appointed by the President under Article 76 of the Constitution
- To be appointed Attorney General, a candidate must be qualified to be appointed as a Judge of the Supreme Court

Main Function

- The Attorney General gives legal advice to the Government of India
- He has the right of audience in all courts in India
- The Attorney General can participate in proceedings of the Parliament without the right to vote he Attorney General appears on behalf of the Government of India in all cases in the Supreme Court
- The Attorney General is to be consulted only in legal matters of greatest importance and only after the Ministry of Law has been consulted
- All references to the AG are made by the Ministry of Law
- The Attorney General cannot appear against the Government of India
- The AG cannot defend an accused in criminal proceedings
- The AG cannot accept directorship of a company without permission of the government
- The AG does not have any executive authority
- The Attorney General is assisted by the Solicitor General and four Additional Solicitor Generals

SOLICITOR GENERAL FOR INDIA

- The Solicitor General assists the Attorney General
- He is the second highest law officer of the country
- The Solicitor General is assisted by four Additional Solicitors General for India

Unlike the Attorney General, the Solicitor General does not give legal advice to the government. The primary responsibility of the Solicitor General is to appear in courts on behalf of the Government of India

- The first Solicitor General of independent India was C K Daphtary (1950-1963)
- The current Solicitor General is Gopal Subramaniam (2009 – present)

THE ADVOCATE GENERAL

- Each state has an Advocate General, whose position is similar to that of the Attorney General of the Centre
- The Advocate General is appointed by the Governor
- A person must be qualified to be a Judge of the High Court to be appointed as Advocate General
- The Advocate General can participate in proceedings of the state legislature without the right to vote

HIGHER EDUCATIO IN INDIA

Higher education provides people with an opportunity to reflect on the critical, social economical, cultural moral and spiritual issues facing humanity. It contributes to the national development though dissemination of specialized knowledge and skills. It is therefore, a crucial factor for survival. Being at the apex of the educational pyramid, it also has a key role in producing teachers for the educational system Higher Education is a key element is demographic dividend and also that it intends to make optimum utilization of human resources specifically in age group of 15-95 years. Formal education system can be categorized into three, namely primary, secondary and tertiary education. Tertiary education is a wider term it is higher education plus vocational education.

Secondary education begins to expose students to the varied roles or science, humanities, and social sciences and also to vocational streams. This is also an appropriate stage to provide children with a sense of history and national perspective and give them opportunities of understand their constitutional duties and rights as citizens. Board of Secondary Education plays the main role in importing this education**. Elementary or primary education** adopts child-centered approach. It continues up to 14 years.

There are three principle levels of qualification in higher education.

1. Undergraduate level leading to bachelors'
2. Postgraduate level leading to master degree
3. Research level leading to Ph.D. Fellowship, or Post doctorate

EVOLUTION OF HIGHER EDUCATION SYSTEM IN INDIA

The development of the education system in India can be broadly divided into five stages

1. Ancient Period/Vedic Period
2. Buddhist Period
3. Medieval period.
4. British period
5. Post Independence period

The origin of education in India can be traced to the Vedic age. Our ancient literature, namely Vedas, Brahman as, and Upanishads revealed the highest knowledge to mankind through our ancient rishis.

1. During the Gupta period India became a centre of higher learning with Nalanda (all branches of knowledge), Takshila (study of medicine), and Ujjain (Study of astronomy) among other.

2. During the advent of Buddhism Sarnath University became a great centre of learning to study Buddhism. Ajanta was also a great place of learning to study Buddhism. Ajanta was also a great place of learning art, architecture and painting. Indian society thrived and its economy also dominated the world under this kind of education system.

3. Mughal education system consisted of primary and secondary schools and even colleges.

Colleges were established at Fatehpur Sikri, Agra, Delhi and other places. Education
system based on Hindu Philosophy also existed side by side.

4 Higher education system under British rule:

The major change in the traditional style of higher education was brought by the European rulers starting from 1600 AD .Till 1850 informal European style learning centres existed across India Their man focus was in development of European language speaking administrators and clerks for enriching the establishment of the European rule. The British were successful by 1800 in controlling much the Indian sub-continent under the rule East India Company. The British established formal system of higher education which continues till date. Lord Macaulay had been responsible in making English as the language of instruction across the education system in India. The British style University was established in Calcutta, Mumbai and Chennai in the year 1857 based on the model of University of London which has been the foundation of the modern higher education system in India. Universities focused on languages, literature, history and philosophy. These learning centers were focused on generating English speaking working class for the British administrative services, army and trade. Modern Science and engineering education which flourished in Europe and America during the late 1800 weren't the main focus under the British rule. By 1903 the Indian Institute of Science was established by Tata with focus on research in science and engineering which is the first higher technical learning system in modern India. The British model of University system continued expand across India leading to growing number of higher learning centers by 1947.

5. India with second largest population is home to the third largest higher education system in the world by volume of students enrolled. **Government of India through Ministry of Human Resource development (MHRD)** under the Department of Higher Education shapes the policies related to higher education. The University Grants Commission (UGC) a statutory body established in 1956 through Parliament enacted law modeled on the UGC of United kingdom is responsible for co-ordination, evaluation and maintaining standards of higher education in India.UGC funded through MHRD is responsible for establishing central universities across India and for recognizing Deemed to be Universities run by privately funded trusts and Universities established by the 28 Federal State governments across India. UGC has established statutory Councils to promote, provide grants, set standards and establish professional education in different areas

In 2006 Singapore China India Japan, and other nations announced a proposed plan to restore and revive the ancient site as Nalanda International University.

KEY DEVELOPMENTS OF MODERN EDUCATION SYSTEM

The Christian missionaries were allowed in the country to preach their religion. In 1817, **CHARTER ACT (1813):-** The objective was to spread scientific knowledge in British India. **Hindu College** was established in Calcutta which later became Presidency College in 1855 and Presidency University in 2010.

ELPHINSTONE REPORT (1823):- It recommended the appointment of district Examination officers, School supervisors, and training to teachers. Elphinostone Institution was set up in 1834 in Bombay which marked the beginning of new developments in the field of higher education. It is one of the oldest colleges of Bombay University.

MACAULAY'S MINUTES (1835):- It suggested diffusion of English education in the country. However these initiatives were mainly directed at elementary and secondary education. Lord Macaulay wanted to build and education system that was secular and scientific, free of age old prejudices and at par with the Western world. In this way, he played his part in building the modern India.

WOOD DISPATCH (1854):- It was the first policy measure regarding higher education. It recommended setting up of three universities namely at Madras, Calcutta and Bombay which were set up in 1857.

HUNTER COMMISSION (1882-1883):- It emphasized the segregation of primary education and higher education. It proposed that universities would have to manage the affiliated colleges.

UNIVERSITIES COMMISSION (1902):- Lord Curzon was the first person to appoint a commission on university education. On January 27, 1902, the Indian Universities Act, 1904- India University Commission was appointed under the Chairmanship of Sir Thomas Raleigh to enquire into conditions and prospects of the universities established in British India and to consider and report upon the proposals of the universities established in British India and to consider and report upon the proposals for improving their constitution and working. The Indian Universities Act of 1904, passed on March 21 was formulated on the basis of the recommendations of the India University commission of 1902.

NATIONAL COUNCIL OF EDUCATION:- After partition of Bengal in 1905, national council of education was set up by swadeshi nationalist leaders, which developed into Jadavpur University after independence.

RESOLUTION ON EDUCATIONS POLICY (1913):- This policy recommended that a university should be established for each province the teaching activities of universities should be encouraged, and that the colleges located in mofussil towns should be developed into teaching universities in due course.

SADDLER COMMISSION (1917):- It is also popular as the Calcutta University commission.

1. It recommended the separation of intermediate education from Degree College and suggested a special selection committee for selection of university teachers.
2. Calcutta university commission suggested the setting up of Central Advisory Board of Education (CASE) CABE was set up in 1920 but was abolished in 1923 due to financial crisis.
3. Under the Government of India Act, 1919 education was made a provincial subject so as to minimize the control of central government in the education system.

HARTOG COMMITTEE (1929):- The committee focused on improving the quality and standard of university level education. It again recommended the setting up of CABE, which was again established in 1935 and has been in existence since.

SAPRU COMMITTEE:- the committee appointed in 1934 by the United province (largely present Uttar Pradesh) Government to enquire into the causes of unemployment in U.P came to the conclusion that the system of education commonly prevalent prepared pupils only for examination and degrees and not for any avocation in life.

ABBOT WOOD REPROT (1937):- It proposed the English should be the medium of instruction at university level. It recommended vocational training through polytechnics and setting up of vocational teacher's training colleges.

WARDHA SCHEME OF ECUCATION (1937):- It is also known as Nai Talim or Basic Education or buniyadi Talim (Shiksha) or basic shiksha. The scheme is an outcome of the philosophy of Gandhi ji. It was given a definite shape by the committee under the chairmanship shape by the committee under the chairmanship of Dr Zakir Hussain who later on become the president of India.

SARGENT REPORT (1944):- The Sergeant report is also called scheme of post war Educational development in India.

HIGHER Education AFTER INDEPENDENCE:- Government of India took several initiatives to improve and promote higher education in the country after independence.

RADHAKRISHNAN COMMISSION (1948-1949):- Radhakrishnan commission also known as university Education commission suggested the integration of secondary education and higher education by setting up of UGC. It also recommended the setting up of rural universities.

MUDALIAR COMMISSION (1952-1953):- It is also popular as the Secondary Education commission. It recommended introducing a three year secondary and a four year higher education system. I also advocated setting up of multipurpose schools and vocational training institutes.

COMMITTEE ON EMOTIONAL INTEGRATION (1961):- It was set up under the chairmanship of Dr Sampurnanand to study the role of educational programmes for youth, in general and students in schools and colleges, in particular in order to strengthen the process of emotional integration.

KOTHARI COMMISSION (1964-1966):- The commission was titled as Education and National Development report. It is a very progressive report. It proposed a three year degree course and a four year honor degree course. Establishment course and a four year honours degree course. Establishment of Indian Education Service (IES)to improve the quality of India higher education with

emphasis on quality teaching faculties to vocationalize secondary education was recommended. It recommended the 6% of the national income should be spent on education.

EDUCATION SUBJECT IN CONCURRENT LIST (1976):- India has a federal setup and education is the concurrent responsibility of both the centre as well of states. Post independence, education (including university education) was the responsibility of the states, while the centre was given the function of coordination and determination of standards. However, in 1976, through Entry 25 (42nd list of the constitutional Amendment) in the concurrent list of the responsibility along with the states for all levels of education.

SAM PITRAODA COMMITTEEE (1917):- It was set up in 2007. It is also popularly known as national knowledge commission (NKC). It recommended restructuring of curricula to meet the demand for multidisciplinary professionals and criteria based resource allocation to ensure maintenance of standards and strategic preferences to promote excellence in higher education.

YASHPAL COMMITTEE:- It suggested scrapping of all higher education, regulatory or monitoring bodies and creation of a super regulator, that is a seven member commission for higher education and Research (CHER). State Higher Education councils would form the second tier of the system.

It also recommended that the deemed university statues be abandoned and that all deserving deemed varsities be either converted into full fledged universities or scrapped. The committee stressed the need for more attention to undergraduate gropgrammes and a multidisciplinary approach to learning. Yashpal Committee also strongly recommended reducing the burden of affiliation of colleges on the universities and a GRE like test be evolved for university education.

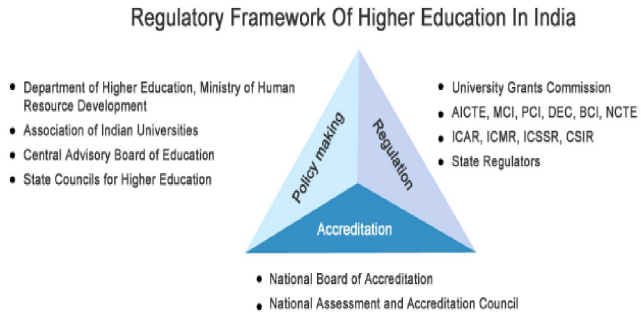
It's the most commonly required admission test for grad school. ... Much like the SAT and ACT, the GRE exam is a broad assessment of your critical thinking, analytical writing, verbal reasoning, and quantitative reasoning skills — all skills developed over the course of many years.

SHARMA COMMITTEE:- Set up under Prof MM Sharma, it deliberated upon the development of science and technology education in India. The committee suggested establishment of India Institute of Science, Education, and Research (IISER). It also recommended expansion of technical education, assuring quality and providing access and affordability for technical education.

HIGHER EDUCATION REGULATORY FRAMEWORK

About UGC & Regulatory Framework

- The regulatory framework of this sector in India is multi-layered. At the last chain of delivery – the classroom, three sets of regulations operate – University, College, and Council
- Universities awarding their own degrees are classified into five types based on their management – Central University, State University, Private University, Institutions-deemed-to-be-a-University and Institute of National Importance. Colleges award degrees in the name of the university to which they are affiliated.
- The University Grants Commission is a statutory organization established by an Act of Parliament in 1956 for the coordination, determination and maintenance of standards of university education.
- Apart from providing grants to eligible universities and colleges, the Commission also advises the Central and State Governments on the measures which are necessary for the development of Higher Education. It functions from New Delhi as well as its six Regional offices located in Bangalore, Bhopal, Guwahati, Hyderabad, Kolkata and Pune.
- Different regulatory bodies such as Medical Council of India (MCI), All India Council for Technical Education (AICTE) and the Bar Council India (BCI), among others, manage different professional courses. There are two accrediting institutions– namely National Board of Accreditation (NBA) established by AICTE and National Assessment and Accreditation Council (NAAC) established by UGC.
- The main governing **body** at the tertiary sector is the University Grants Commission (UGC). It has a dual function of providing grants as well as coordinating and maintaining the standards of higher education institutes.
- All public universities are governed by the UGC, as well as funded by it. The UGC Act of 1956 specifies the entire step-by-step administration of the University it governs, ranging from the number of working daysto a number of lecture hours per subject, as well as the minimum qualification required for students to enrol and for teachers to teach a course.
- UGC Regulations, 2012 mandate that all higher education institutions be accredited by an accreditation agency.
- Powers and functions of UGC include allocation as well as disbursement of funds from the Central/State Government for development, maintenance as well as for research purposes, inspection of universities, conferring of degrees, etcetera.
- Central Government is responsible for major policy relating to higher education in the country. It provides grants to UGC and establishes central universities in the country. The Central Government is also responsible for declaration of Education Institutions as 'Deemed to be University' on the recommendation of the UGC.
- The special Constitutional responsibility of the Central Government: Education is on the 'Concurrent list' subject to Entry 66 in the Union List of the Constitution. This gives exclusive Legislative Power to the Central Govt. for co-ordination and determination of standards in Institutions of higher education or research and scientific and technical institutions.
- The coordination and cooperation between the Union and the States is brought about in the field of education through the Central Advisory Board of Education (CABE).



Supporting the UGC, accreditation for higher learning over Universities is overseen by the following fifteen autonomous regulatory and statutory institutions:

LIST OF THE REGULATORY AND STATUTORY BODIES IN INDIA

Supporting the UGC, accreditation for higher learning over Universities is overseen by the following fifteen autonomous regulatory and statutory institutions:

Higher Education Regulatory Body

To summarise, these above councils are responsible for the recognition of courses, promotion of professional institutions, regulating the course syllabus, providing grants and other awards to various fields of education. These bodies play an important role in the setting up of an institution imparting a degree or diploma course in higher education.

ALL INDIA COUNCIL OF TECHNICAL EDUCATION

- AICTE is the statutory body and the national level council for the regulation of technical education in India. The Council was set up in November 1945 based on the recommendation of the Technical Education Committee of the Central Advisory Board of Education (CABE) of 1943.
- The growth of Technical Education in the Country before independence was very slow. The number of Engineering Colleges and Polytechnics (including Pharmacy and Architecture Institutions) in 1947 was 44 and 43 with an Intake capacity of 3200 and 3400 respectively.

Major Functions and Schemes

- Approval of variation/ increase in Intake, additional Course(s)/ Programme(s) in Technical Institutions
- Approval for Foreign Collaboration/ Twinning Programme
- Participation in the process of granting Institution Deemed to be University status by MHRD
- Share and Mentor Institutions (Margdarshan)•Development of Model Curricula through All India Boards of Studies
- Modernisation and Removal of Obsolescence (MODROBS)
- Entrepreneurship Development Cell (EDC)
- Project Centre for Technical Education
- Community Colleges under NSQF
- Innovation Promotion Scheme (IPS)
- Research Park
- e-Shodh Sindhu
- e-Learning Centre for Technical Education
- Industry Institution Partnership Cell (IIPC)
- Unnat Bharat Abhiyan
- Saansad Adarsh Gram Yojana (SAGY)
- Seminar Grant
- Travel Grant
- Faculty Development Programme (FDP)
- Quality Improvement Programme
- AICTE-Adjunct Faculty
- Trainee Teacher Scheme
- Research Promotion Scheme (RPS)
- AICTE-INAE-DVP (Distinguished Visiting Professor)
- AICTE-INAE-TRF (Teaching Research Fellowship)
- Post Graduate scholarships for GATE/GPAT Qualified Post Graduate students
- Hostel for SC/ ST Students
- Scholarship Scheme for Girl Child (SSGC) – PRAGATI
- Scholarship Scheme for Divyang – SAKSHAM
- AICTE-INAE-TG (Travel Grant for students)
- Skill and Personality development Programme centre for SC/ ST Students

NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL (NAAC)

The National Policy on Education in 1986 initiated the idea of quality assurance in higher education in India. It was after this that the National Board of Accreditation (NBA) was formed under the All India Council for Technical Education (AICTE) and the National Assessment and Accreditation Council (NAAC) under the UGC.

The NAAC was established as an independent body under the UGC in 1994 with the objective of maintaining quality higher education in India. Specifically, the NAAC accredits central, state, private, and Deemed-to-be-Universities, institutions of national importance, and affiliated and autonomous colleges. Higher education institutions are eligible for accreditation only after they have had two rounds of graduates, or have been in existence for six years; whichever comes first.

The University Grants Commission (Mandatory Assessment and Accreditation of Higher Educational Institutions) Regulations 2012 mandates that all universities, institutions, and colleges be accredited by an accreditation agency.

Evaluation by the NAAC has based on seven criteria:

- Curricular Aspects
- Teaching-Learning and Evaluation
- Research, Consultancy, and Extension
- Infrastructure and Learning Resources
- Student Support and Progression
- Governance, Leadership, and Management

- Innovations and Best Practices

Accreditation grades are A, B, C, or D and based on the cumulative grade point average (CGPA) of the scores received on the criteria listed above and sub-sections known as Key Aspects. The CGPA is derived by taking into account a weighted score of the key aspects and criteria, and a weighted average of the criteria points. A grade of A, B, or C, means that the institution has been accredited.

They stand for 'very good', 'good', and 'satisfactory', respectively. A grade of D is unsatisfactory and is not accredited by the NAAC. The points for each of the criteria are allotted differently for universities, autonomous colleges, and affiliated colleges accounting for the difference in the way each functions. More points are allotted to the Teaching, Learning and Evaluation criterion for autonomous and affiliated colleges, than for universities, whereas universities are allotted more points for the Research, Consultancy, and Extension criterion.

NATIONAL BOARD OF ACCREDITATION (NBA)

The NBA was established by the AICTE in 1987 with the purpose of evaluating technical programs. It became an autonomous accreditation body in January 2010, with a mission to ensure that technical and professional institutions, including those in the engineering, technology, architecture, pharmacy, and hospitality fields are providing relevant and quality education. The accreditation process starts with a Self-Assessment Report (SAR) which is to be filled out by the institution for the programs that are applying for accreditation.

The SAR covers the following criteria:

1) Vision, Mission, and Program Educational Objectives
2) Program Outcomes
3) Program Curriculum
4) Students' Performance
5) Faculty Contributions
6) Facilities and Technical Support
7) Academic Support Units and Teaching-Learning Process
8) Governance, Institutional Support and Financial Resources
9) Continuous Improvement

Once the SAR is completed, the NBA constructs a team of one chairperson and two evaluators to evaluate the program. The team prepares a pre-visit report based on their observations of the SAR. A three-day visit to the program is set-up for the evaluators to note the strengths, weaknesses, concerns, and deficiencies of the program based off of the criteria.

The NBA assigns the institution one of three possible statuses for accreditation: **Accredited**, **Provisionally Accredited, or Not Accredited.** The institute receives a status of Accredited for five years if it gets a minimum of 750 points and a minimum of 60 percent in each of the nine criteria.

VARIOUS STUDENTS DEVELOPMENT SCHEMES

- **PG SCHOLARSHIP** – A scholarship is awarded to full-time GATE/GPAT qualified students admitted to M.E./ M. Tech/ M. Arch and M.Pharma courses in AICTE approved Institutions/Colleges @Rs. 12,400/- PM/ student.
- **PRIME MINISTER'S SPECIAL SCHOLARSHIP SCHEME – PMSSS-** Objective of the Scheme is to build up capacities in youth of J&K, educate, enable and empowering them to compete in normal course, enhancing and boosting employment potentials in students of J&K. Total 3430 scholarship are given @ Rs. 100000/- as Maintenance Charges and academic fee as Rs. 30000/- to General Degree, Rs. 125000/- to Engineering Degree & Rs. 300000/- to Medical Degree each year
- **PRAGATI SCHOLARSHIP-** Scholarship/Contingency is awarded to meritorious girls taking admission in AICTE approved Technical institution at Degree/ Diploma. Total 4000 scholarship are given @ Rs. 30000/- as tuition fee reimbursement and Rs. 20000/- as incidentals each year.
- **SAKSHAM SCHOLARSHIP-** Scholarship/Contingency is awarded to Differently abled students taking admission in AICTE approved Technical institution at Degree/ Diploma. Total 1000 scholarship are given @ Rs. 30000/- as tuition fee reimbursement and Rs. 20000/- as incidentals each year.
- **AICTE-INAE TRAVEL GRANT SCHEME-**An "AICTE-INAE Travel Grant Scheme" for Engineering Students to present papers abroad has been launched for enhancing the quality of engineering education in the country.
- **PRERANA – SCHEME FOR PREPARING SC/ST STUDENTS FOR HIGHER EDUCATION-**There is an acute shortage of faculty in engineering & polytechnic colleges. The problem can be addressed by promoting degree students of pre-final and final year to go for post graduate courses. This scheme aims at providing financial support to institutes who are willing to put extra efforts for encouraging and training SC/ST students for GATE/GPAT/CAT/CMAT and GRE.
- **SAMRIDDHI – SCHEME FOR SC/ST STUDENTS FOR SETTING START-UPS-** Looking at the poor job availability in the market, it is necessary to provide opportunities for SC/ST students to start their own enterprise. The broad objective of this scheme to help SC/ST students is in designing, launching and running their own business/startup through entrepreneurship development programme after formal education is over/during their education as per AICTE's startup policy.
- **NATIONAL DOCTORAL FELLOWSHIP (**NDF)**-** To promote research culture in AICTE approved Institutions or admitting full time meritorious research scholars by providing research fellowship to meritorious students who wants to seek admission in Ph.D in AICTE approved Technical Institutes in AICTE approved disciplines for a full time Ph.D.
- **SUPPORT TO STUDENTS FOR PARTICIPATING IN COMPETITION ABROAD (SSPCA)-** To promote research culture in AICTE approved Institutions or admitting full time meritorious research scholars by providing research fellowship to

meritorious students who wants to seek admission in Ph.D in AICTE approved Technical Institutes in AICTE approved disciplines for a full time Ph.D.

- **SMART INDIA HACKATHON 2017-** A unique initiative to identify new and disruptive digital solutions for solving the challenges faced by our country under the program of Smart India Hackathon 2017. This event was held on 1st – 2nd April 2017 for 36 hrs non-stop competition. 9544 technology students, 598 problems statements, 29 different central govt. ministries, 26 different Nodal centres & funding of Rs. 3 Lakh per team for 100 qualified teams

STAFF DEVELOPMENT SCHEMES

SEMINAR GRANT (SG)

The scheme provides financial assistance to institutions for organizing Symposium /Conference/ Seminar / Workshop at National and International level in various fields of Technical Education. Total funding up to Rs 1 Lakh for national and Rs 3 Lakh for International seminars is given under the scheme.

INAE (TRF) INDIAN NATIONAL ACADEMY OF ENGG. (TEACHERS RESEARCH FELLOWSHIP)

Scheme provides fellowship to Engineering Teachers for Doctoral Research in Central Laboratories in order to promote a research culture amongst the faculty in AICTE approved engineering institutions. Limit of funding is Rs. 5.7 lakh per scholar for three year.

QUALITY IMPROVEMENT PROGRAMME

The main objective of the programme is to upgrade the qualification of the faculty members of the degree level institutions in the country. Scholarship @Rs. 15000/-PM and Rs. 5000/ PM are given to Ph.D/ M.Tech. Scholars. Total 94 QIP centers are in the country.

FACULTY DEVELOPMENT PROGRAMME (FDP)

The scheme is intended to Institutions for induction training to teachers employed in AICTE approved Technical Institutions to facilitate up-gradation of knowledge and skill. Rs 5-7 Lakh are granted for the 2 weeks FDP.

ADJUNCT FACULTY

Scheme encourages quality involvement of academicians, scholars, practitioners, policymakers in teaching, research, and related services. The limit of funding is Rs 6 Lakh/Faculty/Institute.

TRAINEE TEACHER SCHEME

The scheme attracts bright UG/PG students to teaching profession by providing M. Tech/Ph. D Fellowships and assured job. The limit of funding Rs 2.5 Lakh per Institute and duration of project is 3 years.

SCHEME OF TRAVEL GRANTS (TG)

The scheme enables meritorious faculty to interact at International Level Conferences, both within and outside India, Seminars, and Symposia.

AICTE-INAE-DVP

AICTE and INAE distinguished visiting Professor scheme envisages promotion of industry-institute interaction.

INSTITUTIONAL DEVELOPMENT SCHEMES

SHARE AND MENTOR INSTITUTIONS (MARGDARSHAN)

Through this Scheme an Institute of repute as a Mentor within an existing facility to serve as the hub to guide and disperse knowledge to and between around ten technical institutions as spokes. The limit of funding is Rs. 50 Lakhs and the duration of the project is for 3 years.

UNNAT BHARAT ABHIYAN

Unnat Bharat Abhiyan is inspired by the vision of transformational change in rural development processes by leveraging knowledge institutions. The limit of funding is Rs 5 Lakh/ Institute and duration of the project is 2 years.

MODERNISATION AND REMOVAL OF OBSOLESCENCE (MODROBS)

The scheme equips technical institutions with infrastructural facilities, laboratories, workshops, and computing facilities to enhance teaching, training and research capabilities. The limit of funding is Rs 20 Lakhs and project duration is 2 years

SKILL AND PERSONALITY DEVELOPMENT PROGRAMME CENTRE FOR SC/ST STUDENTS

Scheme provides opportunity to SC/ST students in the Institutes to reorient themselves in the light of emerging employment opportunities in Engineering undergraduate/Diploma students at all level to empower the SC and ST students. Maximum funding for the scheme is Rs 25 Lakhs and the project duration is 3 years.

HOSTELS FOR SC/ST STUDENTS

The scheme aims to support Government / Government-aided engineering colleges for construction of girls/boys hostels for students /researchers belonging to SC/ST category. Total funding up to Rs 2 Crores is provided to complete project within 2 years time.

SPECIAL SCHEME FOR NORTH EASTERN STATES

To enhance the functional efficiency of the technical institutes located in far-flung areas of North East India, AICTE has launched a scheme for providing logistics support to the technical institutes of NER by extending financial assistance for construction of rain water harvesting system, alternative power support & availability/connection of internet facility

RESEARCH & INNOVATIONS DEVELOPMENT SCHEMES

RESEARCH PROMOTION SCHEME (RPS)

This scheme Promotes Research in identified thrust areas of in Technical Education. RPS is aimed to create research ambience in the institutes by promoting research in engineering sciences and innovations in established and newer technologies; and to generate Master's and Doctoral degree candidates to augment the quality of faculty and research. The limit of funding is Rs 25 Lakh for project duration of 3 years.

ENTREPRENEURSHIP DEVELOPMENT CELL (EDC)

This scheme motivates the students to opt for entrepreneurship and self-employment as attractive and viable career option. The limit of funding is Rs. 10 lakh.

E- SHODH SINDHU

This scheme aims to provide e- resources on technical education to 94 AICTE supported technical Institutes. Rs. 6.5 crore are the subscription rates paid by AICTE in 2017.

GRANT FOR ORGANISING CONFERENCE

The scheme provides financial assistance to institutions for organizing Conference at National and International level in various fields of Technical Education.

TOP 10 INITIATIVE BY GOVT OF INDIA IN HIGHER EDUCATION

Education is the root of progress for any nation. The 42nd constitutional amendment act has transferred education from the state list to concurrent list. Since then along with state government; central government has also become equally committed to delivering value in the field of education.

Institutional bodies like-UGC, AICTC are also working along with the government to improve practical aspects of higher education in the country. Several premier institutes like IITs, IIMs, IISc, IISER have earned their name and make room for themselves in the list of top educational institutions of the world.

Among a series of measures to refine and boost the state of education, following are the top 10 **Higher Education Initiative** by the Government of India-

- NIRF- National Institutional Ranking Framework
- GIAN- Global Initiative for Academic Networks
- UAY- Uchchtar Avishkar Yojana
- IMPRINT-Impacting Research Innovation & Technology
- SWAYAM- Study Web for Active Learning of Young Minds
- NAD- National Academic Repository
- TEQIP- Technical Education Quality Improvement Program
- PMMMNMTT- Pandit Madan Mohan Malviya National Mission on Teachers & Teaching
- National Digital Library Program
- RUSA- Rashtriya Uchchtar Shiksha Abhiyan

LIST OF HIGHER EDUCATION INITIATIVE

1. NIRF

launched on 29th September 2015 by MHRD, this framework intents to outlines a methodology for ranking the institutions across our country. The Core Committee set up by MHRD arrived at the broad level understanding and hence give overall recommendations. Then only the methodology has been driven. The objective is to identify the broad level parameters for the ranking of Indian universities and institutions. The parameters that are broadly covered include- "Teaching, Learning and Resources," "Graduation Outcomes," "Research and Professional Practices," "Outreach and Inclusivity," and the "Perception".

2. GIAN

Aimed to tap the talent of the strong academic network of the country-scientists, entrepreneurs, at international level. To encourage their overall engagement with Higher Education Institutes in India so that country's existing academic resources can be augmented and accelerate the pace of the quality reforms. Further to elevate India's technological and scientific capacity to gain the global excellence. Through this, the best international academic experience can be brought into our education systems. It will enable the interaction of students and the faculty with that of the world level best academic and industry experts and also learn through their experiences motivate people to draw solutions to the Indian problems.

3. UAY

The major objectives of the UAY scheme are to promote innovation & development in IITs addressing the issues of the manufacturing industries; to spur the innovative mindset; to coordinate the action between the academia & industry and to strengthen the labs & the research facilities.

4. IMPRINT

First of this kind Pan-IIT + IISc joint initiative supported by MHRD to address the major challenges in science and engineering. These challenges are must to fix and India must champion in that to enable and empower the country for self-reliance and inclusive growth. This novel type of initiative containing two-fold mandate is intended at:

(a) Developing the new engineering educational policy

(b) Creating a fine road map to pursue the engineering challenges

This scheme provides the overarching vision in higher education that can guides research into the areas which are socially relevant predominantly.

5. SWAYAM

A programme initiated by Government in Higher Education Sector to achieve access, equity, and quality- the three main principles of our Education Policy. Aimed to bridge the digital divide mainly for disadvantaged students and hence providing the best teaching-learning resources to all.

For that an indigenous IT platform is developed for hosting of all courses that are taught in classrooms from the 9th standard to post-graduation. So that they can be accessed by any time, anyone, and anywhere. All these courses have to be interactive, prepared by the best teachers and are free of cost available to Indians. l

The courses are in 4 quadrants –

(a) video lecture, (b) downloaded/printed enabled material (c) self-assessment tests (d) for doubt clearing-an online discussion forum.

6. NAD

National Academic Depository- a 24X7, round the clock online storehouse of all the academic awards such as certificates, degrees, diplomas, mark-sheets etc. that are duly digitized and also lodged by the academic institutions/ universities/boards / or bodies for eligibility assessment. It validates and guarantees their authenticity as well as safe storage. It makes easy access and retrieval of the required academic award.

7. Technical Education Quality Improvement Programme of Government of India (TEQIP)

launched by MHRD in December 2002. It was aimed to support and upscale ongoing efforts in improving the quality of technical education in India and enhancing the existing capacities of the technical institutions to become more dynamic, quality conscious, demand-driven, forward-looking, effective and responsive. It can bring into the rapid economic and technological developments occurring at both national as well as international levels.

8. PMMMNMTT

Envisaged to address all issues related to teachers, teacher preparation, teaching, and their professional development comprehensively. The Mission caters current and urgent issues- supply of the qualified teachers, fetching talent into the teaching profession and raising the quality of teaching at schools and colleges level. Also building a strong professional cadre of a quality teacher with performance standards.

9. National Digital Library Program

Launched under MHRD, with the aim to integrate national and international digital libraries through a one unique web-portal. Under this program, free of cost access to many important books in English and also in other Indian languages is provided for the user to conveniently fetch the required inputs from those books.

10. RUSA

Rashtriya Uchchtar Shiksha Abhiyan. It is the Centrally Sponsored Scheme planned by the Central Government has to implement -the strategic funding, reforms, and improvements in the Higher Education sector at the state level.

NEW EDUCATION POLICY

The National Policy on Education, as formulated in 1986 and modified in1992, has been the guiding document of the policies of the Central Government in the education sector for well over two decades. During this period, significant changes have taken place in India and the world at large. Information technology has changed the way we work, live and perform our day to day activity. The old policy has the clear objective; however, those have not been achieved fully or even 50 %. The ground reality is different from what was formulated. Also, there is no policy in respect of private participation in the education system, both at the school and higher education levels. The Government of India has launched several social and developmental initiatives such as **Swachh Bharat Abhiyan, Digital India, Skill India, Make in India and Smart Cities.** All these initiatives have significant backward and forward linkages with the education sector which need to be taken into account in the new NPE. For the factual progress of a nation, quality education is said to be the foundational stone.

Good education supports new discoveries, fresh knowledge, and cutting-edge innovation that in real determines the growth and prosperity of the nation. Education acts as a dynamic human development aspect. Its relevance keeps on broadening with emerging needs of a society as well as economy.

In India, Our **New Education Policy** was drafted by TSR Subramanian, the former Cabinet Secretary which was done nearly after the thirty years of our previous one education policy. The report is of 200 pages submitted by the concerned Committee with its 90 recommendations. Now the Ministry of Human Resource Development has drafted for National New Education Policy with a few modifications in it.

Findings of the report- Takeaways

It has been reported that the overall quality of the education either in primary or in higher stages has been very poor and has also been deteriorated further in the last nearly 10-15 years. However, the number of the educational institutions have increased.

In education system also, the discrimination factor continues to persist against the weaker and the marginalized children. Its wide-scale presence in society is a proof that the education system cannot remain aloof in terms of discrimination. However, each child has equal educational rights as per RTE but with no significant signs of improvement, RTE is a toothless tiger.

It has been noted as per the findings that teachers, mentors and their training part are often undervalued or neglected while directors, secretaries, and other authorities are given comparatively more importance. The idea should be the teacher-oriented focus as they act the most prominent linkage between the students and the institutions.

Since the current state of educational development in India is, at least 6% of GDP, must be well spent as an essential expenditure for the education sector. The Report has also talked in favor of 6% GDP for the education sector, a well-defined and structured education system of public institutions and strong implementation of the Right to Education Act.

Colleges and Universities are temples of learning. The essence of their existence lies in providing a flawless delivery of education as their primary work. Some of the self-imposed restrictions must in place for them to make sure that their primary work of the universities is conducted with no hindrance.

These institutions ought not to act themselves as political playgrounds for national rivalries, or mushroom inequities, inequalities, and let there be a tussle on social/cultural fault lines; these must be tackled by the forums such as parliament, courts, elections etc and society as a whole. Political events must be restricted to avoid distractions in educational institutions.

However, the Committee reports and MHRD reports, emphasis on the infrastructure development part only. RTE was not been given its due importance in this Report. There are just 10% of the schools, complying with the RTE norms even after 6 years.

Numerous Problems like the quality of education, teacher training, education standardization have been addressed themselves in RTE Act. The segment on detention policy was also removed while formatting RTE so that self-esteem of any child must not be killed. However, despite such worthy initiatives, there remain the poor results.

Suggestions as per the Report-

The Committee has recommended that for the children up to class 5th, no detention policy remain continued when the child is of 11 years of age. From Class 5 to 8, the upper primary class, for children the ages between 11 and 14 years, the system of detention should be restored for the children who remain below the requisite minimum learning standard.

- Based on Continuous and Comprehensive Evaluation (CCE) and the end term examinations, the weak performing students will be identified and they should be provided the remedial teaching solution at the school day end or during the holidays, for this the new arrangements should be created in the school system.
- On the basis of merit, a university should be graded to have the autonomy. The better it performs, more the autonomy it should get. The Committee Report not at all favor of student unions. It marked that the academic issues should be their only agenda if present.
- Despite the best reports and good policy initiatives, the results are not sound. The paralysis remains due to ineffective implementation and poor execution mechanism.

Considering the education as the foundational stone in every individual's life, it becomes the whole sole duty of every enabler to let there be quality education for better gentry and their all-around development throughout in life.

CHALLENGES IN HIGHER EDUCATION IN INDIA

Higher education in India has achieved a remarkable level since independence. In terms of the number of institutions, quality of education and enrolments' things have improved drastically. Government is regularly putting in efforts with the help of Institutional and infrastructural support to the education sector.

As per a report of MHRD, Gross Enrolment Ratio (GER) in India has raised to 18.8%, however, there is still a long way to go when comes to comparing the percentage at the global level this percentage is less by 6 %.

The bodies like National Knowledge Commission (NKC), Yashpal Committee etc have been formed with the objective to bring reforms in the education sector. However, such recommendations have seldom been implemented until they are outdated.

India is proudly delivering quality education to many graduates- postgraduates through top institutions like- IITs, NITs, IIMs, State Universities etc. But then where is the flaw in the whole structure, that is needed to be known.

PROBLEMS WITH HIGHER EDUCATION IN INDIA

Among a number of challenges and issues, hereby a few are listed as below-

- **Supply-Demand imbalance-**

India is a blessed country in terms of demographic dividend. Its youth population is more in number than the population below 14 and above 59. It means the independent population is high than the dependent. This should pay the benefit to India but again the worst imbalance in supply-demand is spoiling the show.

A huge pool of young people's that can be converted as the biggest strength in the form of the workforce for development purpose but ironically it is working another way around.

A large population is unemployed due to poor skills and quality they hold. Even their skills are not matching the current trends of the industry so there is a huge imbalance in the supply-demand side of the workforce.

- **Mushrooming of Low-Quality Institutes-**

Next in the row is Mushrooming of low-quality institutes throughout all the country which are no doubt generating next unemployable persons. Running an institution has become a lucrative business option and on the basis of high advertising tools, many poor-quality institutions are able to secure admissions. It is actually killing the very spirit of higher education industry which was otherwise meant to produce only qualified professionals. Such colleges are just factories to product unemployed population and meant to fill their own pockets only.

- **Less focus on Vocational courses-**

Because of lack of knowledge and awareness students don't go for vocational courses. Rather they believe in routine ways of education. Neither any real project-based learning is given to the students. However, many young graduates must learn new skills there in the market especially vocational skills so they can secure jobs easily. Just theory learning will not help, practical application of the knowledge should rather more be focused.

However, with the schemes like PMKVY (Pradhan Mantri Kaushal Vikas Yojana) many self- employment based short training centres have been opened by the government to get a job to the youth.

- **Rhetoric Strategy and Poor implementation-**

Our educations policy documents are full of rhetoric literature. There seems to be no place for the real numbers. Moreover, in spite of many committees and commissions, there is no room for the implementation on ground level. It remains only at snail's pace.

- **Slow sanction and under-utilization of Funds-**

There is always a hue and cry in universities over the flow of grants. However, even if there is money to be spent it is majorly spent on flaunting rather than the real and meaningful things. Everyone is well aware of march rush when universities rush to spend money in order to prevent it from lapse once the financial year is over.

- **Proper recognition of quality research-**

Higher education institutions are meant to promote research and that research should be utilized in industries for the collective advancement. With the fake research models, the level of research is regularly coming done, and those who do real work are also discouraged.

- **High place of Nepotism in Selections-**

Quality work and high-level professional skills are put secondary when it comes to recruiting the permanent posts at the university level. Money power, political connections play the notable role and thus the major talented stuff of the country is forced to divert its direction and look towards either private institutions or abroad.

IMPORTANT KEY FACTS OF HIGHER EDUCATION SYSTEM IN INDIA

Department of Higher Education

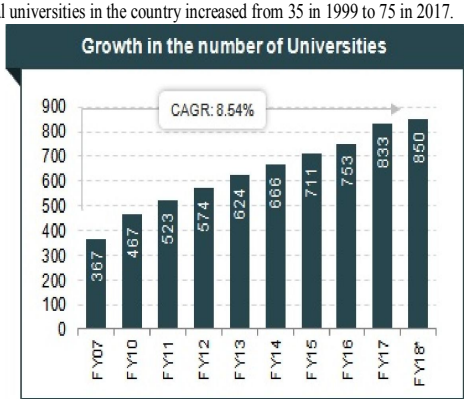
The Department of Higher Education, MHRD, is responsible for the overall development of the basic infrastructure of Higher Education sector, both in terms of policy and planning. Under a planned development process, the Department looks after expansion of access and qualitative improvement in the Higher Education, through world-class Universities, Colleges and other Institutions.

Role of Department of Higher Education

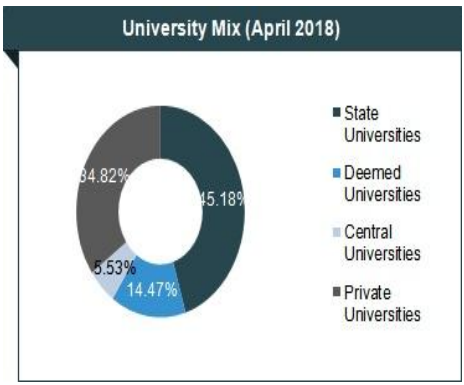
- Enhancement of Gross Enrolment Ratio by expanding access through all modes.
- Promoting the participation of these sections of the society whose GER is lower than the national average.
- To improve quality and to promote academic reforms
- Setting up of new educational institutions and also capacity expansion and improvement of the existing institutions.
- Use of Technology in Higher Education.
- Development of Vocational Education and Skill Development.
- Development of Indian Languages.
- International Collaboration in the field of education.

Education & Training Industry in India

- India has 850 operational universities as of April 2018.
- With both the Government and the private sector stepping up to invest in the Indian education sector, the number of schools and colleges have seen an uptrend over the past few years
- Government's initiative to increase awareness among all sections of the society has played a major role in promoting higher education among the youth.
- Total number of agricultural universities in the country increased from 35 in 1999 to 75 in 2017.



- There has been a significant increase in the share of the state private universities as part of total universities from 3.43 per cent in 2008-09 to 34.82 per cent as of April 2018.
- As of April 2018, India has 384 state universities, 123 deemed to be universities, 47 central universities and 296 private universities.



India holds an important place in the global education industry. India has one of the largest networks of higher education institutions in the world with 850 universities (as of April 2018) and 42,026 colleges. A total of 35.7 million people were enrolled in higher education institutes in 2016-17. However, there is still a lot of potential for further development in the education system.
Moreover, the aim of the government to raise its current gross enrolment ratio to 30 per cent by 2020 will also boost the growth of the distance education in India.

Market Size

The education sector in India is poised to witness major growth in the years to come as India will have world's largest tertiary-age population and second largest graduate talent pipeline globally by the end of 2020. The education sector in India is estimated at US$ 91.7 billion in FY18 and is expected to reach US$ 101.1 billion in FY19E.
Higher education system in India has undergone rapid expansion. Currently, India's higher education system is the largest in the world enrolling over 70 million students while in less than two decades, India has managed to create additional capacity for over 40 million students. By 2025, the segment is expected to reach US$ 35.03 billion.
The country has become the second largest market for e-learning after the US. The sector is expected to reach US$ 1.96 billion by 2021 with around 9.5 million users.

Investment/Recent developments.

The total amount of Foreign Direct Investments (FDI) inflow into the education sector in India stood at US$ 1.67 billion from April 2000 to December 2017, according to data released by Department of Industrial Policy and Promotion (DIPP).
The education and training sector in India has witnessed some major investments and developments in the recent past. Some of them are:

- Indian education sector witnessed 18 merger and acquisition deals worth US$ 49 million in 2017.
- The Ministry of Human Resource Development, Government of India is also planning to raise around Rs 1 lakh crore (US$ 15.52 billion) from private companies and high net worth individuals to finance improvement of education infrastructure in the country.
- India has signed a loan agreement with World Bank under 'Skills Acquisition and Knowledge Awareness for Livelihood Promotion' (SANKALP) Project to enhance institutional mechanisms for skills development.
- Singapore is going to open its first skill development centre in Assam, which will provide vocational training to youth in the region.

Government Initiatives

Some of the other major initiatives taken by the Government of India are:

- The allocation for school education under the Union Budget 2018-19 is expected to increase by 14 per cent, to focus on accelerating existing schemes and quality improvement.
- In order to boost the Skill India Mission, two new schemes, Skills Acquisition and Knowledge Awareness for Livelihood Promotion (SANKALP) and Skill Strengthening for Industrial Value Enhancement (STRIVE), have been approved by the Cabinet Committee on Economic Affairs (CCEA), Government of India, with an outlay of Rs 6,655 crore (US$ 1.02 billion) and will be supported by the World Bank.
- The Government of India has signed a Financing Agreement with the World Bank for IDA credit of US$ 125 million for the "Skills Strengthening for Industrial Value Enhancement Operation (STRIVE) Project".
- NITI Aayog is launching the Mentor India Campaign which will bring leaders and students together at more than 900 Atal Tinkering Labs in India, as part of the Atal Innovation Mission. As of June 2018, 5,441 schools have been selected across India for establishing Atal Tinkering Labs (ATLs) under the Atal Innovation Mission (AIM).
- The Government of India will spend around Rs 20,000 crore (US$ 3.10 billion) to build six new Indian Institutes of Technology (IITs) by March 2024, of which Rs 7,000 crore (US$ 1.08 billion) will be spent by March 2020.
- The Ek Bharat Shreshtha Bharat (EBSB) campaign is undertaken by Ministry of Human Resource Development to increase engagement between states, union territories, central ministries, educational institutions and general public.

- Prime Minister Mr Narendra Modi launched the Skill India initiative – 'Kaushal Bharat, Kushal Bharat'. Under this initiative, the government has set itself a target of training 400 million citizens by 2022 that would enable them to find jobs. The initiatives launched include various programmes like: Pradhan Mantri Kaushal Vikas Yojana (PMKVY), National Policy for Skill Development and Entrepreneurship 2015, Skill Loan scheme, and the National Skill Development Mission.

Road Ahead

In 2030, it is estimated that India's higher education will:

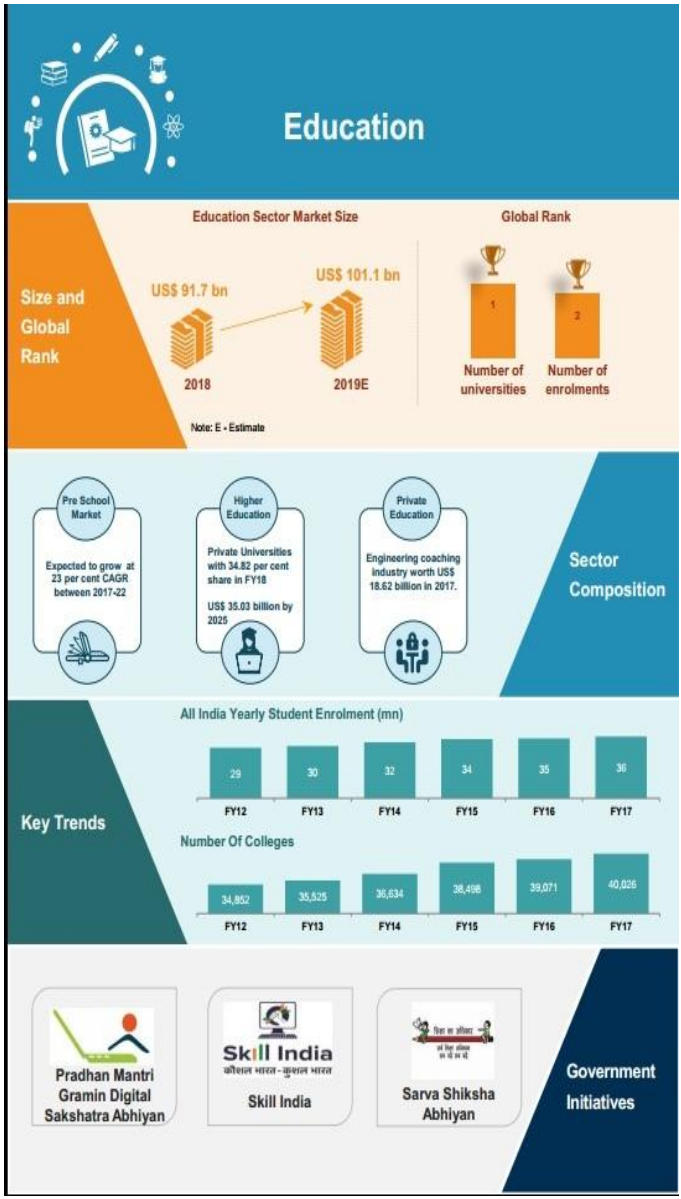
- Adopt transformative and innovative approaches in Higher education.
- Have an augmented Gross Enrolment Ratio (GER) of 50 per cent
- Reduce state-wise, gender based and social disparity in GER to 5 per cent.
- Emerge as a single largest provider of global talent, with one in four graduates in the world being a product of the Indian higher education system.
- Be among the top 5 countries in the world in terms of research output with an annual R&D spent of US$ 140 billion.
- Have more than 20 universities among the global top 200.

Various government initiatives are being adopted to boost the growth of distance education market, besides focusing on new education techniques, such as E-learning and M-learning.

Education sector has seen a host of reforms and improved financial outlays in recent years that could possibly transform the country into a knowledge haven. With human resource increasingly gaining significance in the overall development of the country, development of education infrastructure is expected to remain the key focus in the current decade. In this scenario, infrastructure investment in the education sector is likely to see a considerable increase in the current decade

Moreover, availability of English speaking tech-educated talent, democratic governance and a strong legal and intellectual property protection framework are enablers for world class product development, as per Mr Amit Phadnis, President-Engineering and Site Leader for Cisco (India).

The Government of India has taken several steps including opening of IIT's and IIM's in new locations as well as allocating educational grants for research scholars in most government institutions. Furthermore, with online modes of education being used by several educational organisations, the higher education sector in India is set for some major changes and developments in the years to come.



Important APEX BODY in Higher Education

- All India Council of Technical Education (AICTE)
- Council of Architecture (COA)
- Indian Council of Historical Research (ICHR)
- Indian Council of Philosophical Research (ICPR)
- Indian Council of Social Science Research (ICSSR)
- University Grants Commission (UGC)

Statutory professional councils

- All India Council for Technical Education (AICTE)
- Distance Education Council (DEC)
- Indian Council for Agriculture Research (lCAR)
- Bar Council of India(BCI)
- National Council for Teacher Education (NCTE)
- Rehabilitation Council of India (RCI)
- Medical Council of India (MCI)
- Pharmacy Council of India (PCI)
- Indian Nursing Council (INC)
- Dentist Council of India (DCI)
- Central Council of Homeopathy (CCH)
- Central Council of Indian Medicine (CCIM)

Important Abbreviation to remember

- National Research Professorship (NRP)
- National Institute of Technical Teacher's Training & Research(NITTTR)
- Educational Consultants of India Limited (EdCIL)
- Pupil-Teacher Ratio (PTR)
- National Book Trust of India(NBT)
- Central Advisory Board of Education (CABE)
- All India Survey on Higher Education (AISHE)
- The Indira Gandhi National Tribal University (IGNTU)
- National Assessment and Accredition Council (NAAC)
- National Institutional Ranking Framework (NIRF): The National Institutional Ranking Framework (NIRF) has been approved by the MHRD and launched by Honourable Minister of Human Resource Development on 29th September 2015.

UNIVERSITIES NUMBER

Total No. of Universities in the Country as on 29.06.2017 Universities Total No.
State Universities: 365
Deemed to be Universities: 122
Central Universities: 47
Private Universities: 269
Total: 803

IMPORTANT PORTALS BY DEPARTMENT OF HIGHER EDUCATION

1. IMPRINT

http://imprint-india.org/

IMPRINT is the first of its kind MHRD supported Pan-IIT + IISc joint initiative to address the major science and engineering challenges that India must address and champion to enable, empower and embolden the nation for inclusive growth and self-reliance. The implementation of 141 IMPRINT projects has got underway. These projects have received support from several ministries, councils and departments in addition to the Ministry of Human Resource Development.

Read More at – http://imprint-india.org/approved-projects-under-implementation

2. National Institutional Ranking Framework

https://www.nirfindia.org/Home

The National Institutional Ranking Framework (NIRF) has been accepted by the MHRD and launched by Honourable Minister for Human Resource development on 29th September 2015. This framework outlines a methodology to rank institutions across the country.

- For India Rankings – 2017, the main ranking parameters remain the same. However, there are a few significant changes in a few sub-parameters. Also, this year every large institution will be given a common overall rank as well as a discipline-specific rank as applicable. Details are in the Ranking Document available at https://www.nirfindia.org/Docs/Ranking_Methodology_And_Metrics_2017.pdf
- Ranking Report 0f 2017- https://www.nirfindia.org/flipbook/2017/index.html

3. SWAYAM

https://swayam.gov.in/

SWAYAM is an **instrument for self-actualisation** providing opportunities for a life-long learning. Here learner can choose from hundreds of courses, virtually every course that is taught at the university/ college/school level and these shall be offered by best of the teachers in India and elsewhere. If a student is studying in any college, he/she can transfer the credits earned by taking these courses into their academic record.

The courses hosted on SWAYAM will be in 4 quadrants – (1) video lecture, (2) specially prepared reading material that can be downloaded/printed (3) self-assessment tests through tests and quizzes and (4) an online discussion forum for clearing the doubts.

Steps have been taken to enrich the learning experience by using audio-video and multi-media and state of the art pedagogy/technology.

In order to ensure best quality content are produced and delivered, seven National Coordinators have been appointed: They are NPTEL for engineering, UGC for post-graduation education, CEC for undergraduate education, NCERT & NIOS for school education, IGNOU for out of the school students and, for management studies.

4. Rashtriya Uchchatar Shiksha Abhiyan

The **Rashtriya Uchchatar Shiksha Abhiyan** is the central government's contribution to further the promise held by the rich expanse of India's state universities. The country's future lies in empowering these campuses with all that it takes to enhance learning, better research and promote innovation. A centrally sponsored scheme, RUSA understands that sometimes the most important lessons of life are learnt outside the classroom. So whether it is upgrading libraries or computer laboratories, promoting autonomous colleges or clubbing them to consolidate their strength and forming cluster universities, this programme realizes that every institution holds the power to enrich lives through top-class education.

The **salient objectives** of RUSA are:

- Improve the overall quality of state institutions by ensuring conformity to prescribed norms and standards and adopt accreditation as a mandatory quality assurance framework
- Usher transformative reforms in the state higher education system by creating a facilitative institutional structure for planning and monitoring at the state level, promoting autonomy in State Universities and improving governance in institutions
- Ensure reforms in the affiliation, academic and examination systems
- Ensure adequate availability of quality faculty in all higher educational institutions and promote capacity building at all levels of employment
- Create an enabling atmosphere in the higher educational institutions to promote research and innovation
- Expand institutional base by creating additional capacity in existing institutions and establish new institutions, to achieve higher enrollment
- Correct the regional imbalances in terms of access to higher education by setting up institutions in un-served and underserved areas of the country
- Improve equity in higher education by providing adequate opportunities of higher education to SC/STs and socially and educationally backward classes; promote inclusion of women, minorities, and differently abled persons

5. **Higher Education Statistics and Public Information System (HESPIS)**

To prepare a sound database on Higher Education, Ministry launched All India Survey on Higher Education (AISHE) to collect data from all the institutions of higher learning in the country through electronic mode.

Keeping this in view, a new plan scheme Higher Education Statistics & Public Information System (HESPIS) was proposed in XII Five Year Plan.

The survey is being conducted in an electronic mode for which a centralised portal (http://aishe.gov.in) has been developed wherein each Institution has to register and upload the data.

6. National Academic Depository

http://nad.gov.in/about.html

National Academic Depository (NAD) is born out of an initiative to provide an online store house of all academic awards. National Academic Depository (NAD) is a 24X7 online storehouse of all academic awards viz.certificates, diplomas, degrees, mark-sheets etc. duly digitised and lodged by academic institutions / boards / eligibility assessment bodies.

NAD not only ensures easy access to and retrieval of an academic award but also validates and guarantees its authenticity and safe storage.

National Academic Depository comprises of two interoperable digital depositories viz. CDSL Ventures Limited (CVL) and NSDL Database Management Limited (NDML). These digital depositories have ensured hardware, network facilities and software of prescribed quality for smooth and secured operationalisation of NAD.

The users of the NAD system are free to select either of the depositories for registering/on-boarding NAD.

The users may select either CVL or NDML as their preferred depository for registering onto NAD. The links of the two depositories are available under. The user may click on the link of either of the depositories, which shall re-direct them to respective depository's website. Further details relating to the registration process is available on their respective websites.

7. GIAN

http://www.gian.iitkgp.ac.in/

Govt. of India approved a new program titled Global Initiative of Academic Networks (GIAN) in Higher Education aimed at tapping the talent pool of scientists and entrepreneurs, internationally to encourage their engagement with the institutes of Higher Education in India so as to augment the country's existing academic resources.

MAJOR FOCUSED INDIAN GOVT INITIATIVES

Prime Minister Mr Narendra Modi launched the Skill India initiative – 'Kaushal Bharat, Kushal Bharat'. Under this initiative, the government has set itself a target of training 400 million citizens by 2022 that would enable them to find jobs. The initiatives launched include various programmes like: Pradhan Mantri Kaushal Vikas Yojana (PMKVY), National Policy for Skill Development and Entrepreneurship 2015, Skill Loan scheme, and the National Skill Development Mission.

- PMKVY is the flagship program under the Skill India Initiative and it includes incentivising skill training by providing financial rewards on completion of training to the participants. Over the next year 2.4 million Indians are believed to be benefitted from this scheme.
- National Policy for Skill Development and Entrepreneurship 2015 is India's first integrated program to develop skill and promote entrepreneurship simultaneously. The vision of this programme is to skill the Indian youth rapidly with high standards and at the same time promote entrepreneurship thus creating wealth and gainful employment for the citizens.
- Skill Loan Scheme is designed to disburse loans of Rs 5,000 (US$ 75.3) to Rs 150,000 (US$ 2,260) to 3.4 million Indians planning to develop their skills in the next five years.
- The National Skill Development Mission is developed to expedite the implementation of skilling activities in India by providing the robust institutional framework at the centre and the state.

The National Skill Development Corporation of India (NSDC) under a Public Private Partnership promoted by the Ministry of Finance, Government of India signed a Memorandum of Understanding with Center for Research & Industrial Staff Performance (CRISP), India to explore national and international opportunities for strengthening skills development in India.

[Source Courtesy An initiative of the Ministry of Commerce & Industry, Government of India]

IMPORTANT GOVT. SCHEMES BY PMO OF INDIA

Stand UP India

- The objective of Stand-Up India scheme is to facilitate bank loans between Rs.10 lakh and Rs.1 crore to Scheduled Caste (SC) or Scheduled Tribe (ST) borrower and Woman borrower for setting up a greenfield enterprise (first time venture), in manufacturing, services or trading sector. In case of non-individual enterprises at least 51% of the shareholding and controlling stake should be held by either an SC/ST or Woman entrepreneur.
- The overall intent of the proposal is to influence the institutional credit structure to reach out to underserved sectors of the population.
- Reference URL -https://www.standupmitra.in/

Janani Suraksha Yojna

- The Janani Suraksha Yojana (JSY) is a centrally sponsored Scheme which is being implemented with the objective of reducing maternal and infant mortality by promoting institutional delivery among pregnant women. Under the JSY, eligible pregnant women are entitled for cash assistance irrespective of the age of mother and number of children for giving birth in a government or accredited private health facility. The scheme focuses on poor pregnant woman with a special dispensation for states that have low institutional delivery rates, namely, the states of Uttar Pradesh, Uttarakhand, Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Assam, Rajasthan, Odisha, and Jammu and Kashmir. While these States have been named Low Performing States (LPS) under the scheme, the remaining States/UTs have been named High Performing States (HPS). The scheme also provides performance based incentives to women health volunteers known as ASHA (Accredited Social Health Activist) for promoting institutional delivery among pregnant women.
- State/ District authorities would advance Rs. 5000/- and Rs. Rs.10,000/- to each ANM in HPS /LPS States respectively as a recoupable impressed money from the JSY fund.
- *ASHA package of Rs. 600 in rural areas include Rs. 300 for ANC component and Rs. 300 for facilitating institutional delivery**ASHA package of Rs. 400 in urban areas include Rs. 200 for ANC component and Rs. 200 for facilitating institutional delivery

Housing for all by 2022

- "Housing for All by 2022" Mission – National Mission for Urban Housing
- Providing affordable housing in urban areas
- Reference URL –

AMRUT

- Atal Mission for Rejuvenation & Urban Transformation.The scheme was launched by Prime Minister Narendra Modi in June 2015 with the focus of the urban renewal projects is to establish infrastructure that could ensure adequate robust sewerage networks and water supply for urban transformation. Rajasthan was the first state in the country to submit State Annual Action Plan under Atal Mission for Rejuvenation and Urban Transformation (AMRUT).
- To enhance quality of Urban living
- Reference URL – http://amrut.gov.in/

Atal Pension Yojana (APY)

- The Government announced the introduction of universal social security schemes in the Insurance and Pension sectors for all Indians, specially the poor and the under-privileged, in the Budget for the year 2015-16. Therefore, it has been announced that the Government will launch the Atal Pension Yojana (APY), which will provide a defined pension, depending on the contribution, and its period.
- The APY will be focussed on all citizens in the unorganised sector, who join the National Pension System (NPS) administered by the Pension Fund Regulatory and Development Authority (PFRDA). Under the APY, the subscribers would receive the fixed minimum pension of Rs. 1000 per month, Rs. 2000 per month, Rs. 3000 per month, Rs. 4000 per month, Rs. 5000 per month, at the age of 60 years, depending on their contributions, which itself would be based on the age of joining the APY. The minimum age of joining APY is 18 years and maximum age is 40 years. Therefore, minimum period of contribution by any subscriber under APY would be 20 years or more. The benefit of fixed minimum pension would be guaranteed by the Government.

MGNREGA

- National Rural Employment Guarantee Act 2005 (or, NREGA No 42) was later renamed as the "Mahatma Gandhi National Rural Employment Guarantee Act" (or, MGNREGA), is an Indian labour law and social security measure that aims to guarantee the 'right to work'. It aims to enhance livelihood security in rural areas by providing at least 100 days of wage employment in a financial year to every household whose adult members volunteer to do unskilled manual work.[Source: WikiPedia]
- Refrence url – http://www.nrega.nic.in/netnrega/home.aspx

Make in India

- The Make in India program was launched by Prime Minister Modi in September 2014 as part of a wider set of nation-building initiatives. Devised to transform India into a global design and manufacturing hub, Make in India was a timely response to a critical situation: by 2013, the much-hyped emerging markets bubble had burst, and India's growth rate had fallen to its lowest level in a decade. The promise of the BRICS nations had faded, and India was tagged as one of the so-called 'Fragile Five'. Global investors debated whether the world's largest democracy was a risk or an opportunity. India's 1.2 billion citizens questioned whether India was too big to succeed or too big to fail. India was on the brink of severe economic failure.
- http://www.makeinindia.com/home

MUDRA

- "Micro Units Development and Refinance Agency ltd.Micro Units Development & Refinance Agency Ltd. (MUDRA) is a new institution set up by Government of India to provide funding to the non-corporate, non-farm sector income generating activities of micro and small enterprises whose credit needs are below □10 Lakh.
- Under the aegis of Pradhan Mantri MUDRA Yojana (PMMY), MUDRA has created three products i.e. 'Shishu', 'Kishore' and 'Tarun' as per the stage of growth and funding needs of the beneficiary micro unit. These schemes cover loan amounts as below:
  Shishu: covering loans up to Rs.50,000
  Kishore: covering loans above Rs.50,000 and up to Rs.5,00,000,
  Tarun: covering loans above Rs.5,00,000 and up to Rs.10,00,000
- All Non-Corporate Small Business Segment (NCSBS) comprising of proprietorship or partnership firms running as small manufacturing units, service sector units, shopkeepers, fruits/vegetable vendors, truck operators, foodservice units, repair shops, machine operators, small industries, food processors and others in rural and urban areas, are eligible for assistance under Mudra."

National Rural livelihood mission

- The UPA government had launched the National Rural Livelihoods Mission (NRLM) or Aajeevika in 2011 by revamping the earlier Swarnajayanti Gram Swarozgar Yojana (SGSY). This scheme is currently implemented by the Rural Development Ministry and has been renamed as Deen Dayal Antyodaya Yojana (DAY) after integration of both NULM and NRHM by NDA Government.

National Urban livelihood mission

- The National Urban Livelihoods Mission (NULM) was launched by Manmohan Singh Government in 2013 by restructuring the Swarna Jayanti Shahari Rozgar Yojana (SJSRY) in all district headquarters (irrespective of their population) and all the cities with population of one lakh or more. It is a flagship programme of Ministry of Housing and Urban Poverty Alleviation.

Pandit Deendayal Upadhyay Shramev Jayate Yojana (PDUSJY)

- The Pandit Deendayal Upadhyay Shramev Jayate Karyakram was launched in October 2014 by Government of India. Objective of this scheme is to create conducive environment for industrial development and doing business with ease and also expanding government support to impart skill training for workers. This is an umbrella scheme with five scheme under it as follows:
  - Shram Suvidha Portal;
  - Random Inspection Scheme ;
  - Universal Account Number ;
  - Apprentice Protsahan Yojana and
  - Revamped Rashtriya Swasthya Bima Yojana
- http://labour.gov.in/whatsnew/pandit-deendayal-upadhyay-shramev-jayate-karyakram-initatives

Pradhan Mantri Awas Yojana (PMAY)

- Pradhan mantri awas yojana
- The Mission is being implemented during 2015-2022 and provides central assistance to Urban Local Bodies (ULBs) and other implementing agencies through States/UTs for:
- In-situ Rehabilitation of existing slum dwellers using land as a resource through private participation
- Credit Linked Subsidy with Affordable Housing in Partnership
- Subsidy for beneficiary-led individual house construction/enhancement.

Pradhan Mantri Jan-Dhan Yojana (PMJDY)

- Pradhan Mantri Jan-Dhan Yojana (PMJDY) is National Mission for Financial Inclusion to ensure access to financial services, namely, Banking/ Savings & Deposit Accounts, Remittance, Credit, Insurance, Pension in an affordable manner.
- Account can be opened in any bank branch or Business Correspondent (Bank Mitr) outlet. PMJDY accounts are being opened with Zero balance. However, if the account holder wishes to get cheque book, he/she will have to fulfill minimum balance criteria.

- Objective of "Pradhan Mantri Jan-Dhan Yojana (PMJDY)" is ensuring access to various financial services like availability of basic savings bank account, access to need-based credit, remittances facility, insurance and pension to the excluded sections i.e. weaker sections & low-income groups. This deep penetration at affordable cost is possible only with effective use of technology.
- http://www.pmjdy.gov.in/

Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)

- Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY).The scheme will be a one year cover, renewable from year to year, Insurance Scheme offering life insurance cover for death due to any reason. The scheme would be offered/ administered through LIC and other Life Insurance companies willing to offer the product on similar terms with necessary approvals and tie ups with Banks for this purpose. Participating banks will be free to engage any such life insurance company for implementing the scheme for their subscribers.
- All savings bank account holders in the age 18 to 50 years in participating banks will be entitled to join. In case of multiple saving bank accounts held by an individual in one or different banks, the person would be eligible to join the scheme through one savings bank account only.
- Aadhar would be the primary KYC for the bank account.Renewable one year accidental life cover rs. 2 lakh to all savings bank accounts holders in the age group of 18-70 years for a perimium of 12 pre annum per subscriber

Pradhan Mantri Kaushal Vikas Yojana (PMKVY)

- Pradhan Mantri Kaushal Vikas Yojana (PMKVY) is the flagship scheme of the Ministry of Skill Development & Entrepreneurship (MSDE). The objective of this Skill Certification Scheme is to enable a large number of Indian youth to take up industry-relevant skill training that will help them in securing a better livelihood. Individuals with prior learning experience or skills will also be assessed and certified under Recognition of Prior Learning (RPL).
- Skill development.As of 26th September 2016, 40 Training Centres have been on-boarded under PMKVY (2016-2020) pilot.
- http://www.pmkvyofficial.org/

Pradhan Mantri Krishi sinchaee Yojana

- PMKSY has been conceived amalgamating ongoing schemes viz. Accelerated Irrigation Benefit Programme (AIBP) of the Ministry of Water Resources, River Development & Ganga Rejuvenation (MoWR,RD&GR), Integrated Watershed Management Programme (IWMP) of Department of Land Resources (DoLR) and the On Farm Water Management (OFWM) of Department of Agriculture and Cooperation (DAC).
- To boost up irrigation portential
- http://pmksy.gov.in/AboutPMKSY.aspx

Pradhan Mantri suraksha bima Yojana

- Pradhan Mantri Suraksha Bima Yojana is available to people between 18 and 70 years of age with bank accounts. It has an annual premium of □12 (18¢ US) excluding service tax, which is about 14% of the premium. The amount will be automatically debited from the account. In case of accidental death or full disability, the payment to the nominee will be □2 lakh (US$3,000) and in case of partial Permanent disability □1 lakh (US$1,500). Full disability has been defined as loss of use in both eyes, hands or feet. Partial Permanent disability has been defined as loss of use in one eye, hand or foot.
- Renewable one year accidental death cum disability to all savings bank account holders in the age group of 18-70 years for a premium of Rp. 12 per annum per subscriber.

PRASAD (Pilgrimage Rejuvenation and Spiritual Augmentation Drive)

- National mission on pilgrimage Rejuvenation and spiritual augmentation Drive
- National mission on pilgrimage Rejuvenation and spiritual augmentation Drive.Twelve cities namely Amaravati (Andhra Pradesh), Gaya(Bihar), Dwaraka(Gujarat), Amritsar(Punjab), Ajmer(Rajasthan), Kanchipuram(Tamil Nadu), Vellankani(Tamil Nadu), Puri(Odisha), Varanasi(Uttar Prasesh), Mathura(Uttar Pradesh), Kedarnath (Uttarakhand) and Kamakhya (Assam) have been identified for development under Pilgrimage Rejuvenation and Spirituality Augmentation Drive (PRASAD) by the Ministry of Tourism.
- http://pib.nic.in/newsite/mbErel.aspx?relid=119771

National Heritage City Development and Augmentation Yojana (HRIDAY)

- The Heritage City Development and Augmentation Yojana (HRIDAY) scheme aimed at preserving and revitalizing the soul and unique character of the heritage cities in India, has been approved by the Ministry of Urban Development for the Twelve cities under the scheme in the first phase, namely; Amaravati(Andhra Pradesh); Gaya (Bihar); Dwarka (Gujarat), Badami(Karnataka); Puri (Odisha), Amritsar (Punjab); Ajmer(Rajasthan); Kanchipuram (Tamil Nadu); Vellankani(Tamil Nadu); Warangal (Telangana); Varanasi (Uttar Pradesh); and Mathura (Uttar Pradesh).
- For the HRIDAY scheme under the Ministry of Urban Development, an amount of Rs.453.90 crores has been allocated to the HRIDAY scheme for implementation and development works.
- http://tourism.gov.in/swadesh-darshan-prasad-scheme-guidelines-0

Saansad Adarsh Gram Yojana

- Sansad Adarsh Gram Yojana was initiated to bring the member of parliament of all the political parties under the same umbrella while taking the responsibility of developing physical and institutional infrastructure in villages and turn them into model villages.Under this scheme, each member of parliament needs to choose one village each from the constituency that they represent, except their own village or their in-laws village and fix parameters and make it a model village by 2016.
- For the development of model villages

- http://www.saanjhi.gov.in/

Shyma Prasad mukharjee Urnban mission

- The Mission aims at development of rural growth clusters which have latent potential for growth, in all States and UTs, which would trigger overall development in the region. These clusters would be developed by provisioning of economic activities, developing skills & local entrepreneurship and providing infrastructure amenities. The Rurban Mission will thus develop a cluster of Smart Villages.
- Setting up 200 village clusters by 2019-20 accross the country with all possible urban amenities.
- http://pib.nic.in/newsite/printrelease.aspx?relid=126934

Smart city mission

- Smart Cities Mission is an urban renewal and retrofitting program by the Government of India with a mission to develop 100 cities (the target has been revised to 109 cities) all over the country making them citizen friendly and sustainable. The Union Ministry of Urban Development is responsible for implementing the mission in collaboration with the state governments of the respective cities. The government of India under Prime Minister Narendra Modi has a vision of developing 100 smart cities as satellite towns of larger cities and by modernizing the existing mid-sized cities.
- The objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions. The focus is on sustainable and inclusive development and the idea is to look at compact areas, create a replicable model which will act like a light house to other aspiring cities. The Smart Cities Mission is meant to set examples that can be replicated both within and outside the Smart City, catalysing the creation of similar Smart Cities in various regions and parts of the country.
- http://smartcities.gov.in/

Sukanya Samriddhi accounts(Bti Bachao – Betipadhao)

- The Beti Bachao, Beti Padhao (BBBP) Scheme was introduced in October, 2014 to address the issue of declining child sex ratio (CSR). This is implemented through a national campaign and focused multi-sector action in 100 selected districts with low CSR, covering all States and UTs. It is a joint initiative of the Ministry of Women and Child Development, the Ministry of Health and Family Welfare and the Ministry of Human Resource Development.
- It is a part of "Beti Bachao – Beti Padhao"initiative of government of India (GOI)also known as BBBP
- http://wcd.nic.in/BBBPScheme/main.htm
- Objectives
  - Prevent gender based sex selective elimination
  - Ensure survival & protection of the girl child
  - Ensure education of the girl child

Swachh Bharat Abhiyan

- Swachh Bharat Abhiyan (English: *Clean India Mission*), abbreviated as **SBA** or **SBM**, is a national campaign by the Government of India, covering 4,041 statutory cities and towns, to clean the streets, roads and infrastructure of the country.
- The campaign was officially launched on 2 October 2014 at Rajghat, New Delhi, by Prime Minister Narendra Modi. It is India's biggest ever cleanliness drive and 3 million government employees and school and college students of India participated in this event.
- By inviting people to participate in the drive, the Swachhta Abhiyan has turned into a National Movement. A sense of responsibility has been evoked among the people through the Clean India Movement. With citizens now becoming active participants in cleanliness activities across the nation, the dream of a 'Clean India' once seen by Mahatma Gandhi has begun to get a shape.
- https://swachhbharat.mygov.in/

PREVIOUS YEAR SOLVED QUESTIONS

1. In which year the University Grants Commission was established?
(A) 1948
(B) 1944
(C) 1953
(D) 1960
Answer: C
2. Another name of Basic Education or Nai Talim is :
(A) Compulsory Education
(B) New Education Policy
(C) Wardha Education Plan
(D) Sarva Shikshya Abhiyan
Answer: C
3. The "Report on Currency and Finance" for each of the financial year in India is published by:
(A) Reserve Bank of India
(B) Ministry of Finance
(C) Planning Commission
(D) Central Statistical Organization
Answer: A
4. The idea of 'Democratic Decentralisation' in India was popularised by:
(A) A.D. Gorwala Committee, 1951
(B) Paul H. Appleby Committee, 1953
(C) B.R. Mehta Committee, 1957
(D) Ashok Mehta Committee, 1978
Answer: C
The **Balwant Rai Mehta Committee** was a committee appointed by the Government of India in January 1957 to examine the working of the Community Development Programme(1952) and the National Extension Service(1953) and to suggest measures for their better working. The Chairman of this committee was Balwantrai G Mehta. The committee submitted its report in November 1957 and recommended the establishment of the scheme of 'democratic decentralisation' which finally came to be known as Panchayati Raj.The main aim of Panchayat raj system is to settle the local problems locally and to make the people politically conscious.
5. In India, a political party is recognised as a National or Regional Party by the :
(A) President of India
(B) Election Commission of India
(C) Law ministry in consultation with the Law Commission of India
(D) Union Parliament in consultation with the State Legislatures
Answer: B
6. Which of the following factor/s is/are responsible for the increase of the role of Government in Developing Countries?
(a) Economic Planning
(b) Rising expectation of people
(c) Privatization
(d) Emergence of the concept of Welfare State
Select the most appropriate answer from the codes given below:
Codes:
(A) (a) and (d)
(B) (a), (b) and (d)
(C) Only (c)
(D) Only (d)
Answer: A
7. The launch of satellite channel by IGNOU on 26th January 2003 for technological education for the growth and development of distance education is:
(A) Eklavya channel
(B) Gyandarshan channel
(C) Rajrishi channel
(D) None of these
Answer: A
Eklavya Technology Channel is a distant learning joint initiative between the IIT and IGNOU. It was inaugurated by Prof. Murli Manohar Joshi, Honourable Minister, HRD, S&T and Ocean Development on 26 January 2003. It was inaugurated by Prof. Murli Manohar Joshi, Honourable Minister, HRD, S&T and Ocean Development on 26 January 2003. Eight complete courses are being run in parallel, contributed by IIT Delhi, IIT Kharagpur and IIT Madras and are repeated in the same sequence without a break.
Transmission

- The audio/video programmes produced at the EMPC are broadcast/telecast over Gyan Darshan, Gyan Vani and Edusat Channels of IGNOU and the national channels of AIR/ Doordarshan regularly.

Gyan Darshan

Gyan Darshan offers interesting and informative programmes for different categories of users such as pre-school kids, primary and secondary school children, college/university students, youth seeking career opportunities, housewives and adults. These programmes are contributed by major educational institutions including IGNOU, UGC/CEC*, NCERT/CIET*, Directorate of Adult Education, IITs, TTTIs* and other educational/developmental organisations. The time slots are convenient and the programmes are prepared with the help of experts in the field and experienced production teams. Programmes from abroad are also broadcast to offer the viewer a window to the world.

- Gyan Darshan transmissions, uplinked from the earth station of EMPC-IGNOU New Delhi, can be accessed all over the country throughout the year and round the clock without any break. Gyan Darshan signals can be conveniently received without any special equipment.

Gyan Darshan I

- This is the main Gyan Darshan channel. Its programmes include the 'countrywide classroom' produced by CEC/UGC, 'technovision' produced by IITs and 'Bhasha Mandakini' produced by the Rashtriya Sanskrit Sansthan. Bhasha Mandakini, launched on September 5, 2003, Under Bhasha Mandakini, the 'Sanskrit Bhasha' language series of programmes are developed by the Rasthriya Sanskrit Sansthan in collaboration with other Sanskrit institutes of higher learning such as the Rashtriya Sanskrit Vidyapeeth (Tirupati), Shri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeeth (Delhi) and other Sanskrit institute and universities of repute. Bhasha mandakini is planned to include all languages in the course of time.

Gyan Darshan 2 and TDCC

- Gyan Darshan-2 is devoted entirely to interactive distance education.
- Gyan Darshan-2 and TDCC (Training & Development Communication Channel) are one-way video and two-way audio satellite-based interactive systems. Teleconference through Gyan darshan and TDCC essentially follow the same principle except that the former operates on C-band while the latter on extended C. The signals can be received across the country.
- TDCC is conceived as a 'close user group' and was introduced in 1993 under the aegis of DECU (ISRO) who pioneered the system of one-way video and two-way audio communication system for educational applications. TDCC has 6 up-linking facilities in the country and approximately 1000 downlinks established so far.
- Live interaction or teleconference is yet another and the latest intervention in the distance education system. It provides a human face to the otherwise remote and distant learner. The viewers can directly access teachers/experts in the studio during an ongoing programme, express their views and clear their doubts regarding specific topics/issues as the programme goes on. IGNOU provides free interactive telephonic facility in 79 cities through its toll free number 1-600-1-12345 for teleconferencing on Gyan Darshan-2, TDCC and IRC(Delhi).

Eklavya Technology Channel

- Eklavya brings quality education to students pursuing engineering education.
- Eklavya features lectures of the courses taught at the IITs situated at Kharagpur, Mumbai, Kanpur, Delhi, Guwahati, Roorkee and Chennai.

Gyan Vani

- Gyan Vani is an educational FM Radio channel operating through FM stations from various parts of the country. With 10 FM stations at Allahabad, Bangalore, Coimbatore, Vishakhapatnam, Mumbai, Lucknow, Bhopal, Kolkata, Chennai and Delhi already on air in the first half of 2003, the network is slated to expand to a total of 40 stations.
- Gyan Vani stations operate as media cooperatives, with day-to-day programmes contributed by various Ministries, educational institutions, NGOs and national level institutions such as IGNOU, NCERT, UGC, IITs and open universities. Each station has a range of about 70 km radius, which covers the entire city/town as well as the surrounding area. Gyan Vani serves as an ideal medium for niche listeners and for addressing local educational, developmental and socio-cultural requirements. The programmes are in English, Hindi and the language of the region. The broadcast duration varies from stations to station, and is in the range of 8-12 hours.

IRC

- Besides, IGNOU and All India Radio run a collaborative venture called interactive radio counselling (IRC). Each Sunday, from 4 p.m. to 5 p.m., IRC is available on 189 radio stations. The programmes are produced in Hindi and English and the AIR stations broadcast IRC in the language suited to their region.
- The IRC programmes are prepared by IGNOU. On fourth Sunday of every month the State Open Universities conduct IRCs from Ahmedabad, Bhopal, Bangalore, Patna, Jaipur, Kolkata, Hyderabad and Mumbai.
- *CIET: Central Institute of Educational Technology, a constituent of NCERT*
- *CEC: Consortium of Educational Communication, an inter-university center under UGC*
- *TTTIs: Technical Teachers' Training Institutes*

GSAT-3, also known as **EDUSAT**, was a communications satellite which was launched on 20 September 2004 by the Indian Space Research Organisation. EDUSAT is the first Indian satellite built exclusively to serve the educational sector. It is mainly intended to meet the demand for an interactive satellite-based distance education system for the country EDUSAT carries five K_u band transponders providing spot beams, one K_u band transponder providing a national beam and six extended C band transponders providing national coverage beams.

EDUSAT was successfully launched into a Geosynchronous Transfer Orbit on the first operational launch of the Geosynchronous Satellite Launch Vehicle, which flew from the First Launch Pad at the Satish Dhawan Space Centre in Sriharikota. EDUSAT was initially placed into a transfer orbit with a perigee of 180 kilometres (110 mi) and an apogee of 35,985 kilometres (22,360 mi) and a period of 10.5 hours, inclined at 19.2 degrees to the equator.

EDUSAT was decommissioned in September 2010 and relocated to a graveyard orbit

8. Match List - I with List-Il and select the correct answer from the code given below:

List - I (Institutions)	**List - II (Locations)**
(a) The Indian Council of Historical Research (ICHR)	(i) Shimla
(b) The Indian Institute of Advanced Studies (IIAS)	(ii) New Delhi
(c) The Indian Council of Philosophical Research (ICPR)	(iii) Banglore
(d) The Central Institute of Coastal Engineering for fisheries	(iv) Lucknow

	a	b	c	d
(A)	ii	i	iv	iii
(B)	i	ii	iii	iv
(C)	ii	iv	i	iii
(D)	iv	iii	ii	i

Answer: A

COUNCILS

1. Indian Council of Social Science Research (ICSSR)

The Indian Council of Social Science Research (ICSSR) was established in 1969 for promoting social science research, strengthening different disciplines, improving quality and quantum of research and its utilization in national policy formulation. To realize these objectives, the ICSSR envisaged development of institutional infrastructure, identifying research talents, formulating research programmes, supporting professional organizations and establishing linkages with social scientists in other countries. The ICSSR provides maintenance and development grants to various Research Institutes and Regional Centres across the country. Regional Centres have been set-up as extended arms of the ICSSR to support research and development of local talents and its programmes and activities in a decentralized manner.

Since 1976, the ICSSR has been carrying out surveys of research in different disciplines of social sciences. With a view to give special emphasis to the promotion of social science research in the North Eastern Region, initiatives have been taken in the ICSSR to support research proposals and other activities.

2. Indian Council of Philosophical Research (ICPR)

Indian Council of Philosophical Research (ICPR) was set up in 1977 by the Ministry of Education, Government of India as an autonomous organization for the promotion of research in Philosophy and allied discipline. The ICPR was born out of the conviction that Indian philosophy tradition deserves to have an exclusive and special agency in the country.

The Council has a broad-based membership comprising of distinguished philosophers, social scientists, representatives of the University Grants Commission, Indian Council of Social Science Research, Indian Council of Historic Research, Indian National Science Academy, the Central Government and the Government of Uttar Pradesh. The Governing Body (GB) and the Research Project Committee (RPC) are the main authorities of the council. These bodies are vested with well defined powers and functions.

3. Project of History of Indian Science, Philosophy & Culture (PHISPC)

PHISPC was launched in the year 1990 under the aegis of Indian Council of Philosophical Research (ICPR) with the basic objective of undertaking inter-disciplinary study so that inter-connection between Science, Philosophy and Culture as developed in the long history of Indian civilization, could be brought out in detail. From April 1, 1997, PHISPC was officially de-linked from Indian Council of Philosophical Research (ICPR) for a greater autonomy to complete the Project by the stipulated period, and is now affiliated to Centre for Studies in Civilizations (CSC). Government of India has recognized CSC as the nodal agency for the purposes of funding the ongoing research project, PHISPC. The major programme of PHISPC is to publish several volumes on the theme mentioned in the 'Introduction'.

4. Indian Council of Historical Research (ICHR)

Indian Council of Historical Research is an autonomous organization which was established under Societies Registration Act (Act XXI of 1860) in 1972. The prime objectives of the Council are to give a proper direction to historical research and to encourage and foster objective and scientific writing of history. The broad aims of the Council are to bring historians together, provide a forum for exchange of views between them, give a national direction to an objective and rational presentation interpretation of history, to sponsor historical research programmes and projects and to assist institutions and organizations engaged in historical research. It has a broad view of history so as to include in its fold the history of Science and Technology, Economy, Art, Literature, Philosophy, Epigraphy, Numismatics, Archaeology, Socio-Economic formation processes and allied subjects containing strong historical bias and contents. The ICHR has established two Regional Centres, one at Bangalore and the other at Guwahati with a view to reach out the far flung areas of the country.

5. National Council of Rural Institutes (NCRI)

The National Council of Rural Institute is a registered autonomous society fully funded by the Central Government. It was established on October 19, 1995 with its Headquarters at Hyderabad. Its main objectives are to promote rural higher education on the lines of Mahatma Gandhi's vision for education so as to take up challenges of micro planning for transformation of rural areas as envisaged in National Policy on Education (NPE) 1986. In order to achieve its objectives, the NCRI has been identifying various programmes for providing support and financial assistance, to be taken up by suitable institutions including voluntary organizations.

9. Which of the following is not a Fundamental Right?

(A) Right to equality
(B) Right against exploitation
(C) Right of free compulsory education of all children upto the age of 14
(D) All the above

Answer: D all of above are Fundamental Rights

The right to education at elementary level has been made one of the fundamental rights under the Eighty-Sixth Amendment of 2002 Article 21A – On 2 April 2010, India joined a group of few countries in the world, with a historic law making education a fundamental right of every child coming into force. Making elementary education an entitlement for children in the 6–14 age group, the Right of Children to Free and Compulsory Education Act will directly benefit children who do not go to school at present. This act provides for appointment of teachers with the requisite entry and academic qualifications.

The former Prime Minister Dr. Manmohan Singh announced the operationalisation of the Act. Children, who had either dropped out of schools or never been to any educational institution, will get elementary education as it will be binding on the part of the local and State governments to ensure that all children in the 6–14 age group get schooling. As per the Act, private educational institutions should reserve 25 per cent seats for children from the weaker sections of society. The Centre and the States have agreed to share the financial burden in the ratio of 55:45, while the Finance Commission has given Rs.250 billion to the States for implementing the Act. The Centre has approved an outlay of Rs.150 billion for 2010–2011.

The school management committee or the local authority will identify the drop-outs or out-of-school children aged above six and admit them in classes appropriate to their age after giving special training.

10. The Lok - Sabha can be dissolved before the expiry of its normal five year term by:

(A) The Prime Minister
(B) The Speaker of Lok Sabha
(C) The President on the recommendation of the Prime Minister
(D) None of the above

Answer: C

The President of India cannot dissolve the Houses of Parliament by his discretion.

A little more insight:

Apart from term getting over, President of India can dissolve **only** Lok Sabha and that too, not by his discretion (Rajya Sabha is a continuing chamber). He can dissolve the Lok Sabha in the following two cases:

1. When **No Confidence Motion** is passed in the Parliament: This means that the government has lost the confidence of Parliament and it must resign. Now the President must explore the possibility of forming a government which enjoys the support of Lok Sabha. If that's not possible, he has to dissolve the Lok Sabha and fresh elections are called.
2. When the **Prime Minister himself advises the President** to dissolve the Lok Sabha and call for fresh elections.

Also, there is no such thing as President's rule at Centre. President rule is only for the states.

11. The Chief Election Commissioner can be removed from his office under Article:

(A) 125
(B) 352
(C) 226
(D) 324

Answer: D

The President of India (based on a recommendation from incumbent Govt of India) appoints the Chief Election Commissioner. Conventionally, senior-most Election Commissioner is appointed as CEC. He has tenure of six years, or up to the age of 65 years, whichever is earlier. He enjoys the same official status, salary and perks as available to judges of the Supreme Court of India and High court. The Chief Election Commissioner can be removed only through impeachment by the Parliament.

By the "Election Commission (Condition Of Service Of Election Commissions And Transaction Of Business) Act, 1991", the salary of the chief election commissioner is the same as salary of a Judge of Supreme Court of India.

The provisions about the Election Commission are contained in Part XV of the Constitution Article 324(5) which provides for conditions of service and tenure of office is of special relevance. It reads as follows:

(5) Subject to the provisions of any law made by Parliament, the conditions of service and tenure of office of the Election Commissioners and the Regional Commissioners shall be such as the President may by rule determine:

Provided that the Chief Election Commissioner shall not be removed from his office except in like manner and on the like grounds as a Judge of the Supreme Court and the conditions of service of the Chief Election Commissioner shall not be varied to his disadvantage after his appointment:

Provided further that any other Election Commissioner or a Regional Commissioner shall not be removed from office except on the recommendation of the Chief Election Commissioner.

12. Who among the following can be asked to make a statement in Indian Parliament?
(A) Any MLA
(B) Chief of Army Staff
(C) Solicitor General of India
(D) Mayor of Delhi
Answer: C
The **Solicitor General of India** is below the Attorney General for India, who is the Indian government's chief legal advisor, and its primary lawyer in the Supreme Court of India. T he **Solicitor General of India** is appointed for the period of 3 years. The Solicitor General of India is the secondary law officer of the country, assists the Attorney General, and is himself assisted by several Additional Solicitors General of India. Ranjit Kumar is the present Solicitor General who was appointed so on 7 June 2014 Like the Attorney General for India, the Solicitor General and the Additional Solicitors General advise the Government and appear on behalf of the Union of India in terms of the Law Officers (Terms and Conditions) Rules, 1972. However, unlike the post of Attorney General for India, which is a Constitutional post under Article 76 of the Constitution of India, the posts of the Solicitor General and the Additional Solicitors General are merely statutory. Appointments Committee of the Cabinet appoints the Solicitor General. Whereas Attorney General for India is appointed by the President under Article 76(1) of the Constitution, the solicitor general of India is appointed to assist the attorney general along with four additional solicitors general by the Appointments Committee of the Cabinet. The proposal for appointment of Solicitor General, Additional Solicitor General is generally moved at the, level of Joint secretary/Law Secretary in the Department of Legal Affairs and after obtaining the approval of the Minister of Law & Justice, the proposal is sent to the Appointments Committee of the Cabinet for its approval.

13. Which of the following conclusions is logically valid based on statement given below?
Statement: Most of the Indian states existed before independence.
Conclusions:
(I) Some Indian States existed before independence.
(II) All Indian States did not exist before independence.
(A) only (I) is implied
(B) only (II) is implied
(C) Both (I) and (II) are implied
(D) Neither (I) nor (II) is implied
Answer: B

14. What is the name of the Research station established by the Indian Government for 'Conducting Research at Antarctic?
(A) Dakshin Gangotri
(B) Yamunotri
(C) Uttari Gangotri
(D) None of the above
Answer: A
Dakshin Gangotri was the first scientific base station of India situated in Antarctica, part of the Indian Antarctic Program. It is located at a distance of 2,500 kilometres (1,600 mi) from the South Pole. It is currently being used as a supply base and transit camp. The Dakshin Gangotri Glacier is named after the base.
It was established during the third Indian expedition to Antarctica in 1983–84. This was the first time an Indian team spent a winter in Antarctica to carry out scientific works. The station was built in eight weeks by an 81-member team. Construction was completed late into January 1984 with help from the Indian army and Indian Republic Day was celebrated at the station along with the Soviets and East Germans

15. Ministry of Human Resource Development (HRD) includes:
(A) Department of Elementary Education and Literacy
(B) Department of Secondary Education and Higher Education
(C) Department of Women and Child Development
(D) All the above
Answer: D

16. Parliament can legislate on matters listed in the State list:
(A) With the prior permission of the President.
(B) Only after the constitution is amended suitably.
(C) In case of inconsistency among State legislatures.
(D) At the request of two or more States.
Answer: D
Powers of the Union Parliament to legislate on State List subjects
The Parliament can make laws on the subjects mentioned in the State List in the following circumstances:

1. When a resolution is passed by the Rajya Sabha by two-thirds majority making it lawful for the Parliament to legislate on a subject mentioned in the State List in national interest (Art.249).

2. When a proclamation of emergency is in operation, the Parliament has the power to make laws for the whole or any part of India on any of the matters stated in the State List (Art.250).

3. When two or more States give their consent and pass resolutions for the same in their respective Legislatures to enable the Parliament to make a law on any matter listed in the State List (Art.252). Any such law will be applicable to only those States which have passed such resolution, not to all states.

4. The Parliament has the power to make laws for the whole or any part of India for implementing any treaty, agreement or convention with any other country or any decision made at any international conference etc. (Art.253)

Residuary powers of the Parliament

As per article 248, Parliament has exclusive power to make any law with respect to any matter not listed in the Concurrent List or State List. This power of the Parliament is known as its residuary power of legislation.

Exclusive powers of the Rajya Sabha

The Rajya Sabha enjoys two exclusive powers:

1. As per Article 249, the Rajya Sabha can pass a resolution by two thirds majority of its members for declaring a State List subject of national importance. Such a resolution empowers the Parliament to legislate on such State subject for a period of one year.
2. The Rajya Sabha also has the power to create one or more new All India Service by passing a resolution with two thirds majority of its members. It can discontinue an existing All India Service as well.

17. Which of the following institutions in the field of education is set up by the MHRD Government of India?
(A) Indian council of world Affair, New Delhi
(B) Mythic Society, Bangalore
(C) National Bal Bhawn, New Delhi
(D) India International Centre, New Delhi
Answer: C

Located at Kotla Road, near I.T.O., New Delhi, it caters to children between the age group of 5 to 16 years. Bal Bhavan is an autonomous body under the Ministry of Human Resource Development (HRD) (Approved by the Bal Bhavan Board in its 127th Meeting held on 9/10/1995 with the approval of the Ministry of Human Resource Development (Department of Education)

18. The University Grants Commission was constituted on the recommendation of:
(A) Dr. Sarvapalli Radhakrishnan Commission
(B) Mudaliar Commission
(C) Sargent Commission
(D) Kothari Commission
Answer: A

19. Which one of the following Articles of the Constitution of India safeguards the rights of Minorities to establish and run educational institutions of their own liking?
(A) Article 19
(B) Article 29
(C) Article 30
(D) Article 31
Answer: C

Article 30 in The Constitution Of India 1949: Right of minorities to establish and administer educational institutions

(1) All minorities, whether based on religion or language, shall have the right to establish and administer educational institutions of their choice

(1A) In making any law providing for the compulsory acquisition of any property of an educational institution established and administered by a minority, referred to in clause (1), the State shall ensure that the amount fixed by or determined under such law for the acquisition of such property is such as would not restrict or abrogate the right guaranteed under that clause

(2) The state shall not, in granting aid to educational institutions, discriminate against any educational institution on the ground that it is under the management of a minority, whether based on religion or language

Some Important Articles of the Constitution of India

Let us now look at some of the important articles of the Constitution of India and what they deal with.

ARTICLE	DEALS WITH
1	Name and Territory of Union
3	New States Formation, Alteration of Boundaries etc.
13	Laws inconsistent with or in derogation of the Fundamental Rights
14	Equality before Law (popularly known as Right to Equality)
15	Prohibition of Discrimination (on basis of religion, race, caste, sex or place of birth)

16	Equality in case of Public Employment
17	Abolition of Untouchability
18	Abolition of Titles
19	Protection of Certain Rights to Freedom (popularly known as Right to Freedom)
19a	Freedom of Speech & Expression
19b	Right to Peaceful Assembly
19c	Freedom of Association
19d	Right to Move Freely through India
19e	Freedom of Settlement & Residence
19f	(Omitted as a fundamental right – governed by article 300A.) Right to Own Personal Property.
19g	Freedom to Practise any Profession, Occupation, Trade or Business
21	Right to Life and Personal Liberty
21A	Right to Education
23	Prohibition of Human Trafficking and Forced Labour
24	Prohibition of Child Labour
25	Freedom to Practise & Propagate Religion Freely
29	Protection of Interests of Minorities
32	Remedies for enforcement of Fundamental Rights including writs
44	Uniform Civil Code
50	Separation of Judiciary from Executive
51	Promotion of International Peace and Security
51A	Fundamental Duties
72	Powers of President to Grant Pardons etc.
76	Attorney-General of India
78	Duties of Prime Minister
85	Sessions of Parliament, Prorogation and Dissolution
93	The Speaker & Deputy Speaker of Lok Sabha
100	Voting in Houses
105	Powers, Privileges etc. of Members of Parliament

106	Salaries and Allowances of Members of Parliament
108	Joint Sitting of both Houses of Parliament
109-110	Money Bills
112	Budget
123	President's Power to Promulgate Ordinance while Parliament in Recess
127	Appointment of *ad hoc* Judges in the Supreme Court
139	Supreme Court's Powers to Issue Certain Writs
141	Supreme Court's Law Binding on All Courts
148-149	Comptroller and Auditor-General of India
155	Appointment of Governor
161	Power of Governors to Grant Pardon etc.
165	Advocate-General for the State
167	Duties of Chief Minister
224	Appointment of Additional & Acting Judges in High Courts
224A	Appointment of Retired Judges in High Courts
226	Power of High Courts to issue writs
280	Finance Commission
312	All India Services
324	Election Commission
335	SCs and STs claim to Services and Posts
343	Official Language
352	National Emergency
356	President's Rule in case of Failure of Constitutional Machinery in States
360	Financial Emergency
368	Power of Parliament to Amend the Constitution
370	Temporary provisions with respect to the state of Jammu and Kashmir

20. Match List - I (Institutions) with List - II (Functions) and select the correct answer by using the code given below:

List - I (Institutions)	**List - II (Functions)**
(a) Parliament	(i) Formulation of Budget
(b) C & A.G.	(ii) Enactment of Budget
(c) Ministry of Finance	(iii) Implementation of Budget
(d) Executing Departments	(iv) Legality of expenditure

(v) Justification of Income

Code:

	(a)	(b)	(c)	(d)
(A)	(iii)	(iv)	(ii)	(i)
(B)	(ii)	(iv)	(i)	(iii)
(C)	(v)	(iii)	(iv)	(ii)
(D)	(iv)	(ii)	(iii)	(v)

Answer: B

21. Foundation training to the newly recruited IAS (Probationers) is imparted by:

(A) Indian Institute of Public Administration
(B) Administrative Staff College of India
(C) L.B.S. National Academy of Administration
(D) Centre for Advanced Studies

Answer: C

22. Electoral disputes arising out of Presidential and Vice-Presidential Elections are settled by:

(A) Election Commission of India
(B) Joint Committee of Parliament
(C) Supreme Court of India
(D) Central Election Tribunal

Answer: C

23. Human Development Report for 'each' of the year at global level has been published by:

(A) UNDP
(B) WTO
(C) IMF
(D) World Bank

Answer: A

United Nations Development Programme

UNDP works in about 170 countries and territories, helping to achieve the eradication of poverty, and the reduction of inequalities and exclusion. We help countries to develop policies, leadership skills, partnering abilities, institutional capabilities and build resilience in order to sustain development results.

This is a critical time for the world. At UNDP, we see this period as a huge opportunity to advance the global sustainable development agenda. In September 2015, world leaders adopted the 2030 Agenda for Sustainable Development to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. UNDP is working to strengthen new frameworks for development, disaster risk reduction and climate change. We support countries' efforts to achieve the new Sustainable Development Goals, or Global Goals, which will guide global development priorities through 2030.

UNDP focuses on helping countries build and share solutions in three main areas:

- Sustainable development
- Democratic governance and peacebuilding
- Climate and disaster resilience

In all our activities, we encourage the protection of human rights and the empowerment of women, minorities and the poorest and most vulnerable.

The annual Human Development Report, commissioned by UNDP, focuses the global debate on key development issues, providing new measurement tools, innovative analysis and often controversial policy proposals. The global Report's analytical framework and inclusive approach carry over into regional, national and local Human Development Reports, also supported by UNDP.

UNDP role in UN Coordination

UN coordination is a key priority for UNDP and a commitment in our Strategic Plan. The UNDP Administrator is the Chair of the UN Development Group (UNDG), which unites the funds, programmes, specialized agencies, departments and offices of the UN system that play a role in development. Created by former UN Secretary-General Kofi Annan and endorsed by the General Assembly, the UNDG seeks to 'facilitate joint policy formulation, encourage programmatic collaboration and realize management efficiencies' among UN agencies.

At the country level, this interagency structure is embedded in the Resident Coordinator System (RCS), which encompasses all organizations of the United Nations system with operational activities for development. The RCS is managed by UNDP on behalf of the entire system. The Resident Coordinator function is carried by the UNDP Resident Representative. As the designated representative of the Secretary-General, the Resident Coordinator is the leader of the UN Country Team (UNCT) and plays a central role in coordinating the UN's development operations and ensuring alignment with national priorities. UNDP provides the lion's share of the resources needed to maintain the RC system in over 130 countries. The remainder of the RCS funding comes from a cost-sharing arrangement between all participating agencies.

UNDP also administers the UN Capital Development Fund, which helps developing countries grow their economies by supplementing existing sources of capital assistance by means of grants and loans; and UN Volunteers, which fields over 6,000 volunteers from 160 countries in support of peace and development through volunteerism worldwide.

24. Value education makes a student:
(A) Good citizen
(B) Successful businessman
(C) Popular teacher
(D) Efficient manager
Answer: A
Value education
One definition refers to it as the process that gives young people an initiation into values, giving knowledge of the rules needed to function in this mode of relating to other people, and to seek the development in the student a grasp of certain underlying principles, together with the ability to apply these rules intelligently, and to have the settled disposition to do so Some researchers use the concept values education as an umbrella of concepts that includes moral education and citizenship education Themes that values education can address to varying degrees are character, moral development, Religious Education, Spiritual development, citizenship education, personal development, social development and cultural development.
There is a further distinction between explicit values education and implicit values education where:

- ***explicit values*** *education* is associated with those different pedagogies, methods or programmes that teachers or educators use in order to create learning experiences for students when it comes to value questions.

Another definition of value education is "learning about self and wisdom of life" in a self exploratory, systematic and scientific way through formal education.
Living Values Education Programme (LVEP)
This project of worldwide proportions inspired by the new religious movement called the Brahma Kumaris World Spiritual University incorporates twelve values (unity, peace, happiness, hope, humility, simplicity, trust, freedom, cooperation, honesty, courage, love), and has formed the basis of thekiss whole-school ethos approach in schools such as West Kidlington Primary School, Kidlington whose head master Neil Hawkes and Values education coordinators Linda Heppenstall used the work and other programmes to help them form a values-based school. The LVEP website lists 54 countries where values education projects are undertaken.
Human Values Foundation
The Human Values Foundation was established in 1995 to make available worldwide, a comprehensive values-themed programme for children from 4 to 12 years entitled "Education in Human Values". Its fully resourced lesson plans utilise familiar teaching techniques of discussion, story-telling, quotations, group singing, activities to reinforce learning and times of quiet reflection. Following the success of "EHV", a second programme was published – Social and Emotional Education ("SEE"), primarily for ages 12 to 14+ but it has also proved constructive for older children identified as likely to benefit from help getting their lives 'back on track'. The programmes enable children and young people to explore and put into practice a wide spectrum of values with the potential to enrich their lives. Through the experiential learning, over time participants develop a well considered personal morality, all the while gaining invaluable emotional and social skills to help them lead happy, fulfilled, successful lives.
The Indian Government currently promote Values education in its schools. The Ministry of Human Resource Development has taken strong step to introduce values among schools and teachers training centers. Also India is known as the land of introducing values. In India From the leadership of B. Shaji Kumar, New Golden Education Trust (NGET) Values Based Education has progressing throughout the country among schools from first standard to twelve std class.
25. Networking of libraries through electronic media is known as:
(A) Inflibnet
(B) Libinfnet
(C) Internet
(D) HTML
Answer: A
INFLIBNET Centre (Information and Library Network Centre) is an autonomous Inter-University Centre of the University Grants Commission (UGC) of India under Ministry of HRD (MHRD) located in Gandhinagar, Gujarat. The centre was initially started as a national project under IUCAA in March, 1991. It became an independent Inter-University Centre in June 1996.
INFLIBNET is involved in modernizing university libraries in India and connecting them as well as information centres in the country through a nationwide high speed data network using the state-of-art technologies for the optimum utilization of information. INFLIBNET is set out to be a major player in promoting scholarly communication among academicians and researchers in India.
26. The University which telecasts interactive educational programmes through its own channel is:
(A) B. R. Ambedkar Open University, Hyderabad
(B) I.G.N.O.U.
(C) University of Pune
(D) Annamalai University
Answer: B
27. The Government established the University Grants Commission by an Act of Parliament in the year:
(A) 1980
(B) 1948
(C) 1950
(D) 1956

Answer: D

28. Universities having central campus for imparting education are called:

(A) Central Universities
(B) Deemed Universities
(C) Residential Universities
(D) Open Universities

Answer: A

29. The first Indian Satellite for serving the educational sector is known as:

(A) SATEDU
(B) INSAT - B
(C) EDUSAT
(D) INSAT-C

Answer: C

30. Exclusive educational channel of IGNOU is known as:

(A) GyanDarshan
(B) Cyan Vani
(C) DoorDarshan
(D) Prasar Bharati

Answer: A

31. The head quarter of Mahatma Gandhi Antarrashtriya Hindi Vishwavidyalaya is situated in:

(A) Sevagram
(B) New Delhi
(C) Wardha
(D) Ahmedabad

Answer: C

Mahatma Gandhi Antarrashtriya Hindi Vishwavidyalaya (Mahatma Gandhi International Hindi University, is a Central University located in Wardha, Maharashtra, India.

32. Match List - I with List - II and select the correct answer using the codes given below:

List-I (Institutes)	**List-II** (Locations)
(a) Central Institute of English	(i) Chitrakoot and Foreign Languages
(b) Gramodaya Vishwavidyalaya	(ii) Hyderabad
(c) Central Institute of Higher Tibetan Studies	(iii) New Delhi
(d) IGNOU	(iv) Dharmasala

Codes:

	(a)	(b)	(c)	(d)
(A)	(ii)	(i)	(iv)	(iii)
(B)	(iv)	(iii)	(ii)	(i)
(C)	(iii)	(iv)	(i)	(ii)
(D)	(i)	(ii)	(iv)	(iii)

Answer: A

33. The aim of vocationalization of education is:

(A) Preparing students for a vocation along with knowledge
(B) converting liberal education into vocational education
(C) giving more importance to vocational than general education
(D) making liberal education job-oriented

Answer: D

Vocational education is concerned with the training on vocation. It is related to productivity. Vocational education prepares individuals for jobs. It has adequate employment potentialities. It helps in broadening of horizon. It leads to dignity of labour. It is helpful in the maximum utilisation of the material resources of the country.

34. NAAC is an autonomous institution under the aegis of:

(A) ICSSR
(B) CSIR
(C) AICTE
(D) UGC

Answer: D

35. National Council for Women's Education was established in:

(A) 1958
(B) 1976
(C) 1989
(D) 2000

Answer: A

Deshmukh, Lady Deshmukh (15 July 1909 – 9 May 1981) was an Indian freedom fighter, lawyer, social worker and politician. She was a member of the Constituent Assembly of India and of the Planning Commission of India.

She was the first chairperson of the National Council on Women's Education, established by the Government of India in 1958. In 1959, the committee presented its recommendations, as follows:

1. "The Centre and State Governments should give priority to the education of girls.
2. In the central ministry of education, a department of women's education should be created.
3. For proper education of girls, a Director of Women's Education should be appointed in each state.
4. Co-education should be properly organised at higher level of education.
5. The University Grants Commission should specify a definite amount separately for the education of girls.
6. In the first phase of development, provision of free education should be made for girls up to Class VIII
7. Facilities in the choice of optional subjects should be made available for girls.
8. Girls should get training facilities on a liberal basis.
9. Education of Girls should be given due encouragement in rural areas.
10. A large number of seats in various services should be reserved for them.
11. Programmes for the development of adult women's education should be properly initiated and encouraged."

To commemorate her legacy Andhra University, Visakhapatnam has named its Department of Women Studies as Dr. Durgabai Deshmukh Centre for Women's Studies.

36. Which one of the following is not situated in New Delhi?

(A) Indian Council of Cultural Relations
(B) Indian Council of Scientific Research
(C) National Council of Educational Research and Training
(D) Indian Institute of Advanced Studies

Answer: D

The Indian Institute of Advanced Study (IIAS) is a research institute based in Shimla, India. It was set up by the Ministry of Education, Government of India in 1964 and it started functioning from 20 October 1965

37. Autonomy in higher education implies freedom in:

(A) Administration
(B) Policy-making
(C) Finance
(D) Curriculum development

Answer: D

38. Match List-I with List-II and select the correct answer from the code given below:

List-I (Institutions)	**List-II (Locations)**
(a) Dr. Hari Singh Gour University	(i) Mumbai
(b) S.N.D.T. University	(ii) Baroda
(c) M.S. University	(iii) Jodhpur
(d) J.N. Vyas University	(iv) Sagar

Codes:

	(a)	(b)	(c)	(d)
(A)	(iv)	(i)	(ii)	(iii)
(B)	(i)	(ii)	(vi)	(iv)
(C)	(iii)	(i)	(ii)	(iv)
(D)	(ii)	(iv)	(i)	(iii)

Answer: A

39. According to Radhakrishnan Commission, the aim of Higher Education is:

(A) To develop the democratic values, peace and harmony
(B) To develop great personalities who can give their contributions in politics, administration, industry and commerce
(C) Both (A) and (B)
(D) None of these

Answer: C

40. The National Museum at New Delhi is attached to:

(A) Delhi University
(B) a Deemed University
(C) a Subordinate Office of the JNU
(D) Part of Ministry of Tourism and Culture

Answer: D

On August 15, 1949, the National Museum, New Delhi, was inaugurated in the Rashtrapati Bhawan by Shri R.C. Rajagopalachari, the Governor-General of India. The foundation of the present building was laid by Pandit Jawaharlal Nehru, the Prime Minister of India, on May 12, 1955. The first phase of the National Museumbuilding was formally inaugurated by Dr. SarvepalliRadhakrishnan, the Vice President of India, on December 18, 1960. The second phase of the building was completed in 1989.

While the Museum continued to grow its collection through gifts that were sought painstakingly, artefacts were collected through its Arts Purchase Committee. The Museum presently holds approximately 2,00,000 objects of a diverse nature, both Indian as well as foreign, and its holdings cover a time span of more than five thousand years of Indian cultural heritage.

The National Museum was initially looked after by the Director General of Archaeology until 1957, when the Ministry of Education, Government of India, declared it a separate institution and placed it under its own direct control. At present, the National Museum is under the administrative control of the Ministry of Culture, Government of India.

41. Match List-I with List-II and select the correct answer from the code given below:

List-I (Institutions)	**List-II** (Locations)
(a) National Law Institute	(i) Shimla
(b) Indian Institute of Advanced Studies	(ii) Bhopal
(c) National Judicial Academy	(iii) Hyderabad
(d) National Savings Institute	(iv) Nagpur

Codes:

	(a)	(b)	(c)	(d)
(A)	(iii)	(ii)	(iv)	(i)
(B)	(i)	(ii)	(iii)	(iv)
(C)	(iv)	(iii)	(i)	(ii)
(D)	(iii)	(i)	(ii)	(iv)

Answer: D

42. Election of Rural and Urban local bodies are conducted and ultimately supervised by:

(A) Election Commission of India
(B) State Election Commission
(C) District Collector and District Magistrate
(D) Concerned Returning Officer

Answer: B

43. Which opinion is not correct?

(A) Education is a subject of concurrent list of VII schedule of Constitution of India
(B) University Grants Commission is a statutory body
(C) Patent, inventions, design, copyright and trademarks are the subject of concurrent list
(D) Indian Council of Social Science Research is a statutory body related to research in social sciences

Answer: C

The Concurrent List or List-III (Seventh Schedule) is a list of 52 items (though the last item is numbered 47) given in the Seventh Schedule to the Constitution of India. The legislative section is divided into three lists: Union List, State List and Concurrent List. Unlike the federal governments of the United States, Switzerland or Australia, residual powers remain with the Union Government, as with the Canadian federal government.

The 52 items currently on the list are:

1. Criminal law, including all matters included in the Indian Penal Code at the commencement of this Constitution but excluding offences against laws with respect to any of the matters specified in List I or List II and excluding the use of naval, military or air forces or any other armed forces of the Union in aid of the civil power.

2. Criminal procedure, including all matters included in the Code of Criminal Procedure at the commencement of this Constitution.

3. Preventive detention for reasons connected with the security of a State, the maintenance of public order, or the maintenance of supplies and services essential to the community; persons subjected to such detention.

4. Removal from one State to another State of prisoners, accused persons and persons subjected to preventive detention for reasons specified in Entry 3 of this list.

5. Marriage and divorce; infants and minors; adoption; wills, intestacy and succession; joint family and partition; all matters in respect of which parties in judicial proceedings were immediately before the commencement of this Constitution subject to their personal law.

6. Transfer of property other than agricultural land; registration of deeds and documents.

7. Contracts including partnership, agency, contracts of carriage, and other special forms of contracts, but not including contracts relating to agricultural land.

8. Actionable wrongs.

9. Bankruptcy and insolvency.

10. Trust and Trustees.

11. Administrators – general and official trustees.

11-A. Administration of justice; constitution and Organisation of all courts, except the Supreme Court and the High Courts.

12. Evidence and oaths; recognition of laws, public acts and records, and judicial proceedings.

13. Civil procedure, including all matters included in the Code of Civil Procedure at the commencement of this Constitution, limitation and arbitration.

14. Contempt of court, but not including contempt of the Supreme Court.

15. Vagrancy; nomadic and migratory tribes.

16. Lunacy and mental deficiency, including places for the reception or treatment of lunatics and mental deficients.
17. Prevention of cruelty to animals.
17-A. Forests.
17-B. Protection of wild animals and birds.
18. Adulteration of foodstuffs and other goods.
19. Drugs and poisons, subject to the provisions of Entry 59 of List I with respect to opium.
20. Economic and social planning.
20-A. Population control and family planning.
21. Commercial and industrial **monopolies, combines and trusts**.
22. Trade unions; industrial and labour disputes.
23. Social security and social insurance; employment and unemployment.
24. Welfare of labour including conditions of work, provident funds, employers' liability, workmen's compensation, invalidity and old age pensions and maternity benefits.
25. Education, including technical education, medical education and universities, subject to the provisions of Entries 63, 64, 65 and 66 of List I; vocational and technical training of labour.
26. Legal, medical and other professions.
27. Relief and rehabilitation of persons displaced from their original place of residence by reason of the setting up of the Dominions of India and Pakistan.
28. Charities and charitable institutions, charitable and religious endowments and religious institutions.
29. Prevention of the extension from one State to another of infectious or contagious diseases or pests affecting men, animals or plants.
30. Vital statistics including registration of births and deaths.
31. Ports other than those declared by or under law made by Parliament or existing law to be major ports.
32. Shipping and navigation on inland waterways as regards mechanically propelled vessels and the rule of the road on such waterways, and the carriage of passengers and goods on inland waterways subject to the provisions of List I with respect to national waterways.
33. Trade and commerce in, and the production, supply and distribution of,-
(a) the products of any industry where the control of such industry by the Union is declared by Parliament by law to be expedient in the public interest, and imported goods of the same kind as such products
(b) foodstuffs, including edible oilseeds and oils
(c) cattle fodder, including oilcakes and other concentrates
(d) raw cotton, whether ginned or unginned, and cotton seed; and
(e) raw jute.
33-A. Weights and measures except establishment of standards.
34. Price control.
35. Mechanically propelled vehicles including the principles on which taxes on such vehicles are to be levied.
36. Factories.
37. Boilers.
38. Electricity.
39. Newspapers, books and printing presses.
40. Archaeological sites and remains other than those declared by or under law made by Parliament to be of national importance.
41. Custody, management and disposal of **property** (including agricultural land) declared by law to be evacuee property.
42. Acquisition and requisitioning of property.
43. Recovery in a State of claims in respect of taxes and other public demands, including arrears of land-revenue and sums recoverable as such arrears, arising outside that State.
44. Stamp duties other than duties or fees collected by means of judicial stamps, but not including rates of stamp duty.
45. Inquiries and statistics for the purposes of any of the matters specified in List II or List III.
46. Jurisdiction and powers of all courts, except the Supreme Court, with respect to any of the matters in this List.
44. The Kothari Commission's report was entitled on:
(A) Education and National Development
(B) Learning to be adventure
(C) Diversification of Education
(D) Education and socialization in democracy
Answer: A
45. Which of the following is not a Dual mode University?
(A) Delhi University
(B) Bangalore University
(C) Madras University
(D) Indira Gandhi National Open University
Answer: D
46. Which part of the Constitution of India is known as "Code of Administrators"?

(A) Part I
(B) Part II
(C) Part III
(D) Part IV
Answer: D

47. Which article of the constitution provides safeguards to Naga Customary and their social practices against any act of Parliament?
(A) Article 371 A
(B) Article 371 B
(C) Article 371 C
(D) Article 263
Answer: A

48. Which one of the following is not the tool of good governance?
(A) Right to information
(B) Citizens' Charter
(C) Social Auditing
(D) Judicial Activism
Answer: D

49. The University which telecasts interaction educational programmes through its own channel is
(A) Osmania University
(B) University of Pune
(C) Annamalai University
(D) Indira Gandhi National Open University (IGNOU)
Answer: D

50. Who has signed an MOU for Accreditation of Teacher Education Institutions in India?
(A) NAAC and UGC
(B) NCTE and NAAC
(C) UGC and NCTE
(D) NCTE and IGNOU
Answer: B

51. The recommendation of National Knowledge Commission for the establishment of 1500 Universities is to
(A) Create more teaching jobs
(B) Ensure increase in student enrolment in higher education
(C) Replace or substitute the privately managed higher education institutions by public institutions
(D) Enable increased movement of students from rural areas to urban areas
Answer: B

52. According to Article 120 of the Constitution of India, the business in Parliament shall be transacted in
(A) English only
(B) Hindi only
(C) English and Hindi both
(D) All the languages included in Eighth Schedule of the Constitution
Answer: C

53. Which of the following is more interactive and student centric?
(A) Seminar
(B) Workshop
(C) Lecture
(D) Group Discussion
Answer: D

54. The Parliament in India is composed of
(A) Lok Sabha & Rajya Sabha
(B) Lok Sabha, Rajya Sabha & Vice President
(C) Lok Sabha, Rajya Sabha & President
(D) Lok Sabha, Rajya Sabha with their Secretariats
Answer: C

55. The enrollment in higher education in India is contributed both by Formal System of Education and by System of Distance Education. Distance education contributes
(A) 50% of formal system
(B) 25% of formal system
(C) 10% of the formal system
(D) Distance education system's contribution is not taken into account while considering the figures of enrollment in higher education
Answer: B

56. Assertion (A): The U.G.C. Academic Staff Colleges came into existence to improve the quality of teachers.
Reason (R): University and college teachers have to undergo both orientation and refresher courses.
(A) Both (A) and (R) are true and (R) is the correct explanation.
(B) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
(C) (A) is correct and (R) is false.
(D) (A) is false and (R) is correct.
Answer: A

57. The Right to Information Act, 2005 makes the provision of
(A) Dissemination of all types of information by all Public authorities to any person.
(B) Establishment of Central, State and District Level Information Commissions as an appellate body.
(C) Transparency and accountability in Public authorities.
(D) All of the above
Answer: D

58. The accreditation process by National Assessment and Accreditation Council (NAAC) differs from that of National Board of Accreditation (NBA) in terms of
(A) Disciplines covered by both being the same, there is duplication of efforts.
(B) One has institutional grading approach and the other has programme grading approach.
(C) Once get accredited by NBA or NAAC, the institution is free from renewal of grading, which is not a progressive decision.
(D) This accreditation amounts to approval of minimum standards in the quality of education in the institution concerned.
Answer: B

59. Which option is not correct?
(A) Most of the educational institutions of National repute in scientific and technical sphere fall Under 64th entry of Union list.
(B) Education, in general, is the subject of concurrent list since 42nd Constitutional Amendment Act 1976.
(C) Central Advisory Board on Education (CABE) was first established in 1920.
(D) India had implemented the right to Free and Compulsory Primary Education in 2002 through 86th Constitutional Amendment.
Answer: C

60. Which statement is not correct about the "National Education Day" of India?
(A) It is celebrated on 5th September every year.
(B) It is celebrated on 11th November every year.
(C) It is celebrated in the memory of India's first Union Minister of Education, Dr. Abul Kalam Azad.
(D) It is being celebrated since 2008
Answer: A
National Education Day is an annual observance in India to commemorate the birth anniversary of Maulana Abul Kalam Azad, the first education minister of independent India, who served from 15 August 1947 until 2 February 1958. National Education Day of India is celebrated on 11 November every year

61. Match List-I with List-II and select the correct answer from the codes given below:

List – I (Articles of the Constitution)	**List – II** (Institutions)
(a) Article 280	(i) Administrative Tribunals
(b) Article 324	(ii) Election Commission of India
(c) Article 323	(iii) Finance Commission at Union level
(d) Article 315	(iv) Union Public Service Commission

Codes:
(a) (b) (c) (d)
(A) (i) (ii) (iii) (iv)
(B) (iii) (ii) (i) (iv)
(C) (ii) (iii) (iv) (i)
(D) (ii) (iv) (iii) (i)
Answer: A

62. Deemed Universities declared by UGC under Section 3 of the UGC Act 1956, are not permitted to
(A) Offer programmes in higher education and issue degrees.
(B) Give affiliation to any institute of higher education.
(C) Open off-campus and off-shore campus anywhere in the country and overseas respectively without the permission of the UGC.
(D) Offer distance education programmes without the approval of the Distance Education Council
Answer: C

63. India's first Defense University is in the State of
(A) Haryana
(B) Andhra Pradesh
(C) Uttar Pradesh
(D) Punjab
Answer: A

64. Most of the Universities in India
(A) Conduct teaching and research only
(B) Affiliate colleges and conduct examinations
(C) Conduct teaching/research and examinations
(D) Promote research only
Answer: C
65. Which one of the following is not a Constitutional Body?
(A) Election Commission
(B) Finance Commission
(C) Union Public Service Commission
(D) Planning Commission
Answer: D
66. Which one of the following statements is not correct?
(A) Indian Parliament is supreme.
(B) The Supreme Court of India has the power of judicial review.
(C) There is a division of powers between the Centre and the States.
(D) There is a Council of Ministers to aid and advise the President.
Answer: B
67. Which one of the following statements reflects the republic character of Indian democracy?
(A) Written Constitution
(B) No State religion
(C) Devolution of power to local Government institutions
(D) Elected President and directly or indirectly elected Parliament
Answer: D
68. Who among the following appointed by the Governor can be removed by only the President of India?
(A) Chief Minister of a State
(B) A member of the State Public Service Commission
(C) Advocate-General
(D) Vice-Chancellor of a State University
Answer: B
69. The first Open University in India was set up in the State of
(A) Andhra Pradesh
(B) Delhi
(C) Himachal Pradesh
(D) Tamil Nadu
Answer: A
70. Most of the Universities in India are funded by
(A) The Central Government
(B) The State Governments
(C) The University Grants Commission
(D) Private bodies and Individuals
Answer: C
71. Which of the following organizations looks after the quality of Technical and Management education in India?
(A) NCTE
(B) MCI
(C) AICTE
(D) CSIR
Answer: C
72. Consider the following statements:
Identify the statement which implies natural justice.
(A) The principle of natural justice is followed by the Courts.
(B) Justice delayed is justice denied.
(C) Natural justice is an inalienable right of a citizen
(D) A reasonable opportunity of being heard must be given.
Answer: C
73. The President of India is
(A) The Head of State
(B) The Head of Government
(C) Both Head of the State and the Head of the Government
(D) None of the above
Answer: A

The President of the Republic of India is the head of state of India and the commander-in-chief of the Indian Armed Forces.
The President is indirectly elected by an electoral college comprising the Parliament of India (both houses) and the Legislative Assemblies of each of India's states and territories, who themselves are all directly elected. The office-holder serves for a term of five years; there are no term limits. The oath of the President is taken in the presence of the Chief Justice of India, and in their absence, by the most senior judge of the Supreme Court of India.
Although the Article 53 of the Constitution of India states that the President can exercise his powers directly or by subordinate authority,[3] with few exceptions, all of the executive powers vested in the President are, in practice, exercised by the Prime Minister with the help of the Council of Ministers. The President is bound by convention to act on the advice of the Prime Minister and Cabinet.
The Prime Minister of India is the head of government and leader of the executive branch of the Government of India. The Prime Minister is also the chief advisor to the President of India and head of the Council of Ministers. They can be a member of any of the two houses of Parliament (the Lok Sabha or the Rajya Sabha), but has to be the leader of the political party, having a majority in the Lok Sabha.

74. Who among the following holds office during the pleasure of the President of India?
(A) Chief Election Commissioner
(B) Comptroller and Auditor General of India
(C) Chairman of the Union Public Service Commission
(D) Governor of a State
Answer: D

75. The aim of value education to inculcate in students is
(A) The moral values
(B) The social values
(C) The political values
(D) The economic values
Answer: A

76. Indicate the number of Regional Offices of University Grants Commission of India.
(A) 10
(B) 07
(C) 08
(D) 09
Answer: B

77. One-rupee currency note in India bears the signature of
(A) The President of India
(B) Finance Minister of India
(C) Governor, Reserve Bank of India
(D) Finance Secretary of Government of India
Answer: D

78. Match the List – I with the List – II and select the correct answer from the codes given below:

List – I (Commissions and Committees)	**List – II** (Year)
(a) First Administrative Reforms Commission	(i) 2005
(b) Paul H. Appleby Committee I	(ii) 1962
(c) K. Santhanam Committee	(iii) 1966
(d) Second Administrative Reforms Commission	(iv) 1953

	(a)	(b)	(c)	(d)
(A)	(i)	(iii)	(ii)	(iv)
(B)	(iii)	(iv)	(ii)	(i)
(C)	(iv)	(ii)	(iii)	(i)
(D)	(ii)	(i)	(iv)	(iii)

Answer: B

79. Constitutionally the registration and recognition of political parties is the function performed by
(A) The State Election Commission of respective States
(B) The Law Ministry of Government of India
(C) The Election Commission of India
(D) Election Department of the State Governments
Answer: C

80. The members of Gram Sabha are
(A) Sarpanch, Upsarpanch and all elected Panchas
(B) Sarpanch, Upsarpanch and Village level worker
(C) Sarpanch, Gram Sevak and elected Panchas
(D) Registered voters of Village Panchayat

Answer: D

81. Indian Institute of Advanced Study is located at

(A) Dharmshala
(B) Shimla
(C) Solan
(D) Chandigarh

Answer: B

82. Indicate the number of Regional Offices of National Council of Teacher Education

(A) 04
(B) 05
(C) 06
(D) 08

Answer: A

83. Which of the following rights was considered the "Heart and Soul" of the Indian Constitution by Dr. B.R. Ambedkar?

(A) Freedom of Speech
(B) Right to Equality
(C) Right to Freedom of Religion
(D) Right to Constitutional Remedies

Answer: D

84. Who among the following created the office of the District Collector in India?

(A) Lord Cornwallis
(B) Warren Hastings
(C) The Royal Commission on Decentralisation
(D) Sir Charles Metcalfe

Answer: B

85. The Fundamental Duties of a citizen include

(1) Respect for the Constitution, the National Flag and the National Anthem
(2) To develop the scientific temper.
(3) Respect for the Government.
(4) To protect Wildlife.

Choose the correct answer from the codes given below:

Codes:

(A) 1, 2 and 3
(B) 1, 2 and 4
(C) 2, 3 and 4
(D) 1, 3, 4 and 2

Answer: B

86. The President of India takes oath

(A) To uphold the sovereignty and integrity of India.
(B) To bear true faith and allegiance to the Constitution of India.
(C) To uphold the Constitution and Laws of the country.
(D) To preserve, protect and defend the Constitution and the law of the country.

Answer: D

87. Which of the following statement(s) is/are not correct about the Attorney General of India?

(1) The President appoints a person, who is qualified to be a Judge of a High Court, to be the Attorney General of India.
(2) He has the right of audience in all the Courts of the country.
(3) He has the right to take part in the proceedings of the Lok Sabha and the Rajya Sabha.
(4) He has a fixed tenure.

Select the correct answer from the codes given below:

Codes:

(A) 1 and 4
(B) 2, 3 and 4
(C) 3 and 4
(D) 3 only

Answer: A

88. Which of the following prefix President Pranab Mukherjee desires to be discontinued while interacting with Indian dignitaries as well as in official notings?

1. His Excellency 2. Mahamahim
3. Hon'ble 4. Shri/Smt.

Select the correct answer from the codes given below:

Codes:

(A) 1 and 3
(B) 2 and 3
(C) 1 and 2
(D) 1, 2 and 3
Answer: C

89. Which of the following can be done under conditions of financial emergency?
1. State Legislative Assemblies can be abolished.
2. Central Government can acquire control over the budget and expenditure of States.
3. Salaries of the Judges of the High Courts and the Supreme Court can be reduced.
4. Right to Constitutional Remedies can be suspended.
Select the correct answer from the codes given below:
Codes:
(A) 1, 2 and 3
(B) 2, 3 and 4
(C) 1 and 2
(D) 2 and 3
Answer: D

90. Match List – I with List – II and select the correct answer from the codes given below:

List – I	**List – II**
(a) Poverty Reduction Programme	(i) Mid-day Meals
(b) Human Development Scheme	(ii) Indira Awas Yojana (IAY)
(c) Social Assistance Scheme	(iii) National Old Age Pension (NOAP)
(d) Minimum Need Scheme	(iv) MNREGA

Codes:

	(a)	(b)	(c)	(d)
(A)	(iv)	(i)	(iii)	(ii)
(B)	(ii)	(iii)	(iv)	(i)
(C)	(iii)	(iv)	(i)	(ii)
(D)	(iv)	(iii)	(ii)	(i)

Answer: A

91. India has the highest number of students in colleges after
(A) the U.K.
(B) the U.S.A.
(C) Australia
(D) Canada
Answer: B

92. In which of the following categories the enrolment of students in higher education in 2010-11 was beyond the percentage of seats reserved?
(A) OBC students
(B) SC students
(C) ST students
(D) Women students
Answer: A

93. Which one of the following statements is not correct about the University Grants Commission (UGC)?
(A) It was established in 1956 by an Act of Parliament.
(B) It is tasked with promoting and coordinating higher education.
(C) It receives Plan and Non-Plan funds from the Central Government.
(D) It receives funds from State Governments in respect of State Universities.
Answer: D

94. Consider the statement which is followed by two arguments (I) and (II):
Statement: Should India switch over to a two party system?
Arguments:
(I) Yes, it will lead to stability of Government.
(II) No, it will limit the choice of voters.
(A) Only argument (I) is strong.
(B) Only argument (II) is strong.
(C) Both the arguments are strong.
(D) Neither of the arguments is strong.
Answer: C

95. Consider the statement which is followed by two arguments (I) and (II):
Statement: Should persons with criminal background be banned from contesting elections?

Arguments:
(I) Yes, it will decriminalize politics.
(II) No, it will encourage the ruling party to file frivolous cases against their political opponents.
(A) Only argument (I) is strong.
(B) Only argument (II) is strong.
(C) Both the arguments are strong.
(D) Neither of the arguments is strong.
Answer: A

96. Which of the following statement(s) is/are correct about a Judge of the Supreme Court of India?
1) A Judge of the Supreme Court is appointed by the President of India.
2) He holds office during the pleasure of the President.
3) He can be suspended, pending an inquiry.
4) He can be removed for proven misbehaviors or incapacity.
Select the correct answer from the codes given below:
Codes:
(A) 1,2 and 3
(B) 1,3 and 4
(C) 1 and 3
(D) 1 and 4
Answer: D

97. In the warrant of precedence, the Speaker of the Lok Sabha comes next only to
(A) The President
(B) The Vice-President
(C) The Prime Minister
(D) The Cabinet Ministers
Answer: C

98. Which of the following is/are a minority institution(s)?
1. Punjabi University, Patiala
2. Osmania University, Hyderabad
3. Kashmir University, Srinagar
4. St. Stephens College, Delhi
Select the correct answer from the code given below:
Codes:
(A) 1 and 2
(B) 2 and 4
(C) 2 only
(D) 4 only
Answer: D

99. Which of the following statements are correct about the National Advisory Council (NAC)?
1. The National Advisory Council is a statutory body.
2. It is headed by the Prime Minister of India.
3. It facilitates constant interaction with the leaders of civil society.
4. It provides policy and legislative inputs to the Government of India.
Select the correct answer from the code given below:
Codes:
(A) 1, 2 and 3
(B) 2, 3 and 4
(C) 1, 3 and 4
(D) 3 and 4
Answer: D

100. Which of the following are voluntary provisions in the 73rd Constitutional Amendment Act (1992)?
1. Minimum age of 21 for contesting elections to Panchayats.
2. Indirect elections to the post of Chairperson of Panchayats at the intermediate and district levels.
3. Representation of Members of Parliament and State Legislature on Panchayati Raj institutions.
4. Reservation of seats for backward classes.
Select the correct answer from the code given below:
Codes:
(A) 1, 2 and 4
(B) 2, 3 and 4
(C) 1, 2 and 3
(D) 3 and 4

Answer: D

101. In which of the following States the segment of population, which is in majority, enjoys the benefit of reservation of seats in the State Assembly?

(A) Meghalaya and Mizoram
(B) Assam and Nagaland
(C) Madhya Pradesh and Assam
(D) Rajasthan and Arunachal Pradesh

Answer: A

102. Which of the following are the ways of acquiring Indian citizenship?

1. Birth
2. Descent
3. Naturalisation
4. Incorporation of territory

Select the correct answer from the code given below:

Codes:

(A) 1 and 2
(B) 1 and 4
(C) 1, 2 and 3
(D) 1, 2, 3 and 4

Answer: D

103. Which of the following statements about the Union Public Service Commission are correct?

1. UPSC is a Constitutional body.
2. It serves as an advisory body.
3. It is called upon to advise the Government in regard to representation of the Scheduled Castes and Scheduled Tribes in the Civil Service.
4. It is consulted on appointments of Chairman and members of Tribunals and Commissions.

Select the correct answer from the code given below:

Codes:

(A) 1, 2 and 3
(B) 1, 2 and 4
(C) 1, 3 and 4
(D) 1 and 2

Answer: D

104. Which one of the following Councils has been disbanded in 2013?

(A) Distance Education Council (DEC)
(B) National Council for Teacher Education (NCTE)
(C) National Council of Educational Research and Training (NCERT)
(D) National Assessment and Accreditation Council (NAAC)

Answer: A

105. Which of the following statements are correct about the National Assessment and Accreditation Council?

1. It is an autonomous institution.
2. It is tasked with the responsibility of assessing and accrediting institutions of higher education.
3. It is located in Delhi.
4. It has regional offices.

Select the correct answer from the codes given below:

Codes:

(A) 1 and 3
(B) 1 and 2
(C) 1, 2 and 4
(D) 2, 3 and 4

Answer: B

106. The power of the Supreme Court of India to decide disputes between two or more States falls under its

(A) Advisory Jurisdiction
(B) Appellate Jurisdiction
(C) Original Jurisdiction
(D) Writ Jurisdiction

Answer: C

107. Which of the following statements are correct?

(1) There are seven Union Territories in India.
(2) Two Union Territories have Legislative Assemblies
(3) One Union Territory has a High Court.

(4) One Union Territory is the capital of two States.
Select the correct answer from the codes given below
(A) 1 and 3 only
(B) 2 and 4 only
(C) 2, 3 and 4 only
(D) 1, 2, 3 and 4
Answer: D

108. Which of the following statements are correct about the Central Information Commission?
(1) The Central Information Commission is a statutory body.
(2) The chief Information Commissioner and other Information Commissioners are appointed by the president of India.
(3) The Commission can impose a penalty upto a maximum of Rs 25,000
(4) It can punish an errant officer.
Select the correct answer from the codes given below:
Codes:
(A) 1 and 2 only
(B) 1, 2 and 4
(C) 1, 2 and 3
(D) 2, 3 and 4
Answer: C

109. Who among the following conducted the CNN-IBN - The Hindu 2013 Election Tracker Survey across 267 constituencies in 18 States?
(A) The Centre for the Study of Developing Societies (CSDS)
(B) The Association for Democratic Reforms (ADR)
(C) CNN and IBN
(D) CNN, IBN and the Hindu
Answer: A

110. Who among the following is the defacto executive head of the planning Commission?
(A) Chairman
(B) Deputy Chairman
(C) Minister of State of Planning
(D) Member Secretary
Answer: B

111. Education as a subject of legislation figures in the
(A) Union List
(B) State List
(C) Concurrent List
(D) Residuary Powers
Answer: C

112. Which of the following are Central Universities?
1. Pondicherry University
2. Vishwa Bharati
3. H.N.B. Garhwal University
4. Kurukshetra University
Select the correct answer from the code given below:
(A) 1, 2 and 3
(B) 1, 3 and 4
(C) 2, 3 and 4
(D) 1, 2 and 4
Answer: A

113. Consider the statement which Is followed by two arguments (i) and (ii).
Statement:
India should have a very strong and powerful Lokpal.
Arguments:
(i) Yes, it will go a long in eliminating corruption in bureaucracy.
(ii) No; it will discourage honest officers from making quick decisions.
Codes:
(A) Only argument (i) is strong.
(B) Only argument (ii) is strong.
(C) Both the arguments are strong.
(D) Neither of the arguments is strong.
Answer: A

114. Which of the following universities has adopted the Meta university concept?
(A) Assam University
(B) Delhi University
(C) Hyderabad University
(D) Pondicherry University
Answer: B
115. Which of the following statements are correct about a Central University?
1. Central University is established under an Act of Parliament.
2. The President of India acts as the visitor of the University.
3. President has the power to nominate some members to the Executive Committee or the Board of Management of the University.
4. The President occasionally presides over the meetings of the Executive Committee or Court.
Select the correct answer from the code given below:
Codes:
(A) 1, 2 and 4
(B) 1, 3 and 4
(C) 1, 2 and 3
(D) 1, 2, 3 and 4
Answer C
116. The maximum number of fake institutions / universities as identified by the UGC in the year 2014 is in the State / Union territory of
(A) Bihar
(B) Uttar Pradesh
(C) Tamil Nadu
(D) Delhi
Answer: B
117. Which of the following institutions are empowered to confer or grant degrees under the UGC Act, 1956?
(1) A university established by an Act of Parliament.
(2) A university established by an Act of Legislature.
(3) A university / institution established by a linguistic minority.
(4) An institution which is a deemed to be university.
Select the correct answers from the codes given below:
(A) 1 and 2
(B) 1, 2 and 3
(C) 1, 2 and 4
(D) 1, 2, 3 and 4
Answer: C
118. MOOC stands for
(A) Media Online Open Course
(B) Massachusetts Open Online Course
(C) Massive Open Online Course
(D) Myrind Open Online Course
Answer: C
119. Which of the following are the tools of good governance?
1. Social Audit
2. Separation of Powers
3. Citizen's Charter
4. Right to Information
Select the correct answer from the codes given below:
(A) 1, 3 and 4
(B) 2, 3 and 4
(C) 1 and 4
(D) 1, 2, 3, and 4
Answer: D
120. Right to privacy as a Fundamental Right is implied in
(A) Right to Freedom
(B) Right to Life and Personal Liberty
(C) Right to Equality
(D) Right against Exploitation
Answer: B
121. Which of the following organizations deals with "capacity building programe" on Educational Planning?
(A) NCERT

(B) UGC
(C) NAAC
(D) NUEPA
Answer: D
122. Which of the following powers, the President has in relation to Lok Sabha?
(1) Summoning
(2) Adjournment- sine die
(3) Prorogation
(4) Dissolution
Select the correct answer from the codes given below:
(A) 1 and 4
(B) 1, 2 and 3
(C) 1, 3 and 4
(D) 1, 2, 3 and 4
Answer: B
123. The interval between two sessions of parliament must not exceed
(A) 3 months
(B) 6 months
(C) 4 months
(D) 100 days
Answer: B
124. The session of the parliament is summoned by
(A) The President
(B) The Prime Minister
(C) The Speaker of the Lok Sabha
(D) The Speaker of the Lok Sabha and the Chairman of the Rajya Sabh
Answer: A
125. Civil Service Day is celebrated in India on
(A) 21st April
(B) 24th April
(C) 21st June
(D) 7th July
Answer: A
126. The South Asia University is situated in the city of
(A) Colombo
(B) Dhaka
(C) New Delhi
(D) Kathmandu
Answer: C
127.The University Grants Commission was established with which of the following aims
a) Promotion of research and development in higher education
b) Identifying and sustaining institutions of potential learning
c) Capacity building of teachers
d) Providing autonomy to each and every higher educational institution in India
(A) (a), (b), (c) and (d)
(B) (a), (b) and (c)
(C) (b), (c) and (d)
(D) (a), (b) and (d)
Answer: B
128. The Gross Enrolment Ratio (GER) in institutions of higher education in India at present (2015) is about
(A) 8 percent
(B) 12 percent
(C) 19 percent
(D) 23 percent
Answer: C
129. The total number of central universities in India in April 2015 was
(A) 8
(B) 14
(C) 27
(D) 43
Answer: D

130. Which of the following are the objectives of Rashtriya Uchchatar Shiksha Abhiyan (RUSA)?
(a) To improve the overall quality of state institutions.
(b) To ensure adequate availability of quality faculty.
(c) To create new institutions through upgradation of existing autonomous colleges.
(d) To downgrade universities with poor infrastructure into autonomous colleges.
Select the correct answer from the codes given below:
(A) (a), (b), (c) and (d)
(B) (a), (b) and (c)
(C) (a), (c) and (d)
(D) (a), (b) and (d)
Answer: B

131. The grounds on which discrimination in admission to educational institutions is constitutionally prohibited are
(a) Religion
(b) Sex
(c) Place of birth
(d) Nationality
Select the correct answer from the codes given below:
(A) (b), (c) and (d)
(B) (a), (b) and (c)
(C) (a), (b) and (d)
(D) (a), (b), (c) and (d)
Answer: B

132. Which of the following statements are correct about Lok Sabha?
(a) The Constitution puts a limit on the size of the Lok Sabha.
(b) The size and shape of the Parliamentary Constituencies is determined by the Election Commission.
(c) First - past - the Post electoral system is followed.
(d) The Speaker of Lok Sabha does not have a casting vote in case of an equality of votes.
Select the correct answer from the codes given below:
(A) (a) and (c)
(B) (a), b) and (c)
(C) (a), (c) and (d)
(D) (a), (b), (c) and (d)
Answer: A

133. Public Order as an item in the Constitution figures in
(A) the Union List
(B) the State List
(C) the Concurrent List
(D) the Residuary Powers
Answer: B

134. The term of office of the Advocate General of a State is:
(A) 4 years
(B) 5 years
(C) 6 years or 65 years of age whichever is earlier
(D) not fixed
Answer: D

135. Which among the following States has the highest number of seats in the Lok Sabha?
(A) Maharashtra
(B) Rajasthan
(C) Tamil Nadu
(D) West Bengal
Answer: A

136. NMEICT stands for:
(A) National Mission on Education through ICT
(B) National Mission on E-governance through ICT
(C) National Mission on E-commerce through ICT
(D) National Mission on E-learning through ICT
Answer: A

137. Which of the following core value among the institutions of higher education are promoted by the NAAC (National Assessment and Accreditation Council)?
(a) Contributing to national development.
(b) Fostering global competencies among the students.

(c) Inculcating a value system among students.
(d) Promoting the optimum utilization of the infrastructure.
Select the correct answer from the codes given below:
Codes:
(A) (b), (c) and (d)
(B) (a), (b) and (c)
(C) (a), (c) and (d)
(D) (a), (b), (c) and (d)
Answer: B
138. Which of the following statements about the Indian political system is/are correct?
(a) The president is both Head of the State and Head of the Government.
(b) Parliament is Supreme.
(c) The Supreme Court is the guardian of the Constitution.
(d) The Directive Principles of State Policy are justiciable.
Select the correct answer from the codes given below:
(A) (a), (b), (c) and (d)
(B) (b), (c) and (d)
(C) (b) and (c)
(D) (c) only
Answer: C
139. Which of the following are the fundamental duties?
(a) To respect the National Flag.
(b) To protect and improve the natural environment.
(c) For a parent to provide opportunities for education to his/her child.
(d) To protect monuments and places of national importance.
Select the correct answer from the codes given:
Codes:
(A) (a), (b) and (c)
(B) (a), (b) and (d)
(C) (a), (c) and (d)
(D) (a), (b), (c) and (d)
Answer: D
140. Which of the following statements are correct in respect of Niti Aayog?
(a) It is a constitutional body.
(b) It is a statutory body.
(c) It is neither a constitutional body nor a statutory body.
(d) It is a think-tank.
Select the correct answer from the codes given below:
(A) (a) and (d)
(B) (b) and (d)
(C) (c) and (d)
(D) (b), (c) and (d)
Answer: C
141. The best way for providing value education is through
(A) discussions on scriptural texts
(B) lecture/discourses on values
(C) seminars/symposia on values
(D) mentoring/reflective sessions on values
Answer: B
142. The National Judicial Appointments Commission (NJAC) has been declared unconstitutional by
(A) The Supreme Court of India
(B) The High Court
(C) The High Court and the Supreme Court both
(D) The President of India
Answer: A
143. The statement "the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer Hardware" refers to
(A) Information Technology (IT)
(B) Information and Collaborative Technology (ICT)
(C) Information and Data Technology (IDT)
(D) Artificial Intelligence (AI)

Answer: A

144. Which of the following universities/institutes is ranked first in the India Rankings 2016?

(A) Jawaharlal Nehru University, New Delhi
(B) Central University, Hyderabad
(C) Indian Institute of Science, Bangalore
(D) Institute of Chemical Technology, Mumbai

Answer: C

145. Which of the following statements are correct about distance education in India?

(a) It supplements formal education.
(b) It reduces the cost of education.
(c) It replaces the formal education.
(d) It enhances access to education.

Select the correct answer from the codes given below:

Codes:

(A) (a), (b), (c) and (d)
(B) (a), (c) and (d)
(C) (a), (b) and (d)
(D) (b), (c) and (d)

Answer C

146. Which of the following are statutory bodies?

(a) Election Commission of India
(b) University Grants Commission (UGC)
(c) All India Council for Technical Education (AICTE)
(d) National Assessment and Accreditation Council (NAAC)

Select the correct answer from the codes given below:

Codes:

(A) (a), (b) and (c)
(B) (b), (c) and (d)
(C) (b) and (c)
(D) (b) and (d)

Answer: C

147. Which of the following statements are not correct in respect of Rajya Sabha?

(a) It has same powers as those of Lok Sabha.
(b) It can pass a vote of no-confidence against the Council of Ministers.
(c) It can amend a money bill.
(d) It can be dissolved during emergency.

Select the correct answer from the codes given below:

Codes:

(A) (b) and (c)
(B) (b), (c) and (d)
(C) (a), (b) and (c)
(D) (a), (b), (c) and (d)

Answer: D

148. Which of the following statement(s) is/are correct about the powers of the Governor of a State?

(a) He has the power to dissolve the Legislative Assembly.
(b) He has the power to appoint judges of the State High Court.
(c) He has the power to grant pardon in case of death sentence.
(d) He has diplomatic powers.

Select the correct answer from the codes given below:

Codes:

(A) (a) only
(B) (a) and (b)
(C) (a), (b) and (d)
(D) (a), (b) and (c)

Answer A

149. In which of the following cases, the principle of natural justice (Hear the other party) must be followed?

(a) Dismissal of an employee
(b) Supersession of a municipality
(c) Threat to national security
(d) Disciplinary action against a student or an employee

Select the correct answer from the codes given below:

Codes:
(A) (a) and (b)
(B) (a) and (d)
(C) (a), (b) and (d)
(D) (a), (b), (c) and (d)
Answer: C

150. Which of the following are the demerits of globalization of higher education?
(a) Exposure to global curriculum
(b) Promotion of elitism in education
(c) Commodification of higher education
(d) Increase in the cost of education
Select the correct answer from the codes given below:
Codes:
A. (a) and (d)
B. (a), (c) and (d)
C. (b), (c) and (d)
D. (a), (b), (c) and (d)
Answer: C

151. Which of the following statements are correct about deemed universities?
(a) The Governor of the State is the chancellor of deemed universities.
(b) They can design their own syllabus and course work.
(c) They can frame their own guidelines regarding admission and fees.
(d) They can grant degrees.
Select the correct answer from the codes given below:
Code:
A. (A), (B) and (C)
B. (B), (C) and (D)
C. (A), (C) and (D)
D. (A), (B), (C) and (D)
Answer: B

152.The purpose of value education is best served by focusing on
A. Cultural practices prevailing in the society.
B. Norms of conduct laid down by a social group
C. Concern for human values
D. Religious and moral practices and instructions.
Answer: C

153. Which of the following statements are correct?
(a) Rajya Sabha is a permanent House which can be dissolved only during national emergency.
(b) Rajya Sabha does not represent the local interests of the States.
(c) Members of the Rajya Sabha are not bound to vote at the dictates of the states they represent.
(d) No Union territory has a representative in the Rajya Sabha.
Select the correct answer from the codes given below:
Code:
A. (a) and (d)
B. (b) and (c)
C. (b), (c) and (d)
D. (a), (b), (c) and (d)
Answer: B

154. Which of the following are not necessarily the immediate consequences of the proclamation of the President's Rule in a State?
(a) Dissolution of the State of Ministers in the State
(b) Removal of the Council of Ministers in the State.
(c) Takeover of the State administration by the Union Government
(d) Appointment of a new Chief Secretary
Select the correct answer from the codes given below:
Codes:
A. (a) and (d)
B. (a), (b) and (c)
C. (a), (b), (c) and (d)
D. (b) and (c)
Answer: A

155. Instead of holding the office during the pleasure of the President who among the following hold (s) office during good behavior?

(a) Governor of a state
(b) Attorney General of India
(c) Judges of the High Court
(d) Administrator of a Union Territory

Select the correct answer from the codes given below:

Codes:

A. (a) only
B. (c) Only
C. (a) and (c)
D. (a), (b), (c) and (d)

Answer: B

Author's Biography

Dr. Gaurav Jangra is Graduate in Business Administration from Maharishi Dayanand University, Rohtak and Post Graduation is also in Business Administration from Central University of Haryana, Mahendergarh with first division, M.Com. from Guru Jambheshwar University of Science and Technology, Hisar. He completed his Doctorate at Department of Business Administration, Chaudhary Devi Lal University Sirsa. He qualified UGC NET & JRF in Management and UGC NET in Commerce. He is currently working as Head of Department, Commerce and Management at Synetic Business School, Ludhiana, Punjab. He has been gaining satisfaction from his profession of teaching and research for more than five years. He published more than a fifteen quality research papers in reputed National and International refereed journals related to finance, marketing and Information Technology. He is attended and contributed in more than twenty Seminars, Workshops, and Conferences. He already published two edited book volumes. Apart from teaching and research he is well expert in Website Designing. His area of specialization is Finance, Marketing and Information Technology. Currently he also maintaining and providing online education fir UGC NET Aspirants through his website www.easynotes4u.com and Android Apps "EasyNotes4U and UGC NET eBooks" on Google Play Store.