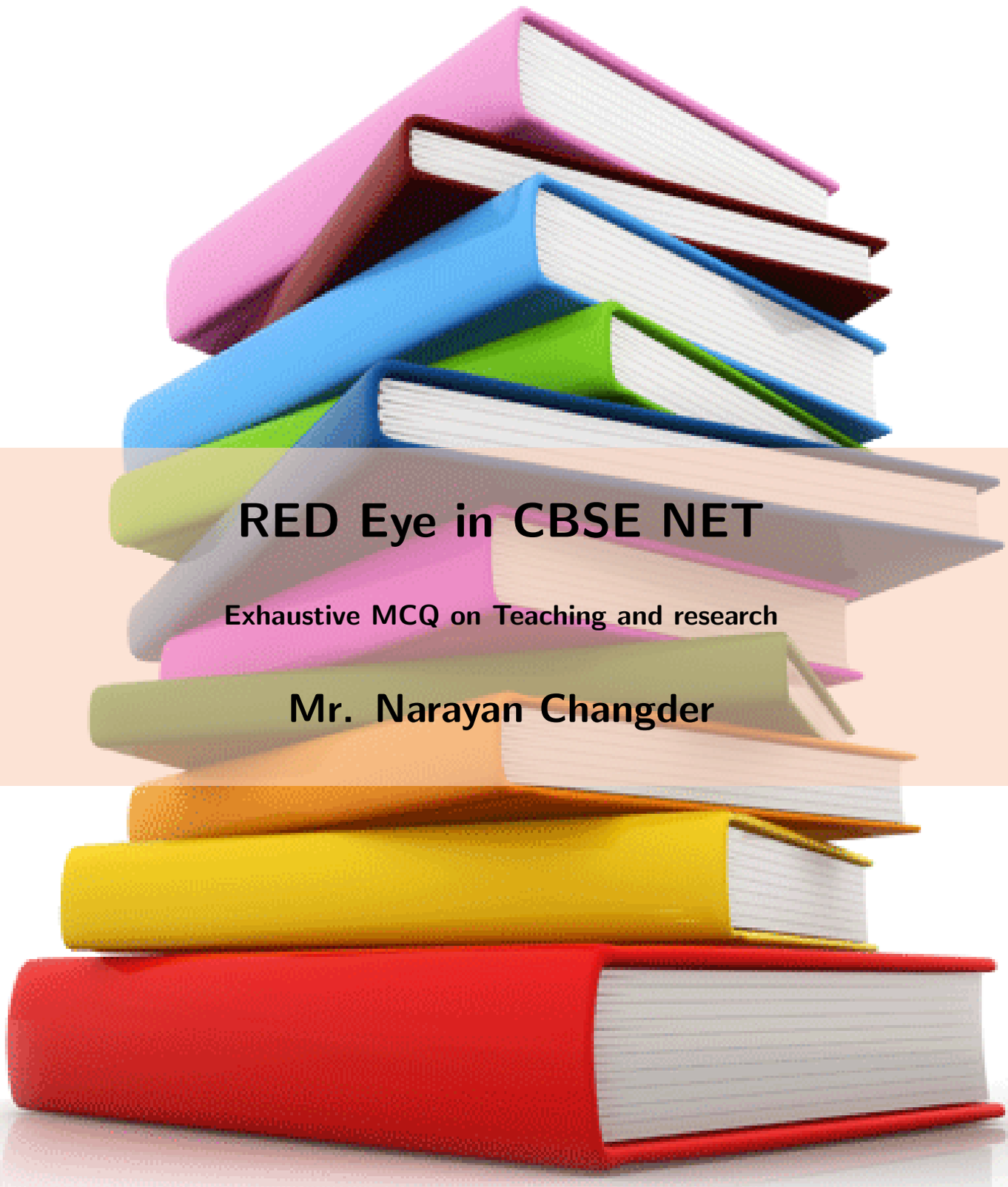
Teaching & research Aptitude

For UGC/CBSE NET, B.ED

General paper-I

NARAYAN CHANGDER



RED Eye in CBSE NET

Exhaustive MCQ on Teaching and research

Mr. Narayan Changder

RED EYE IN CBSE NET

Dedicated to Sarvepalli Radhakrishnan (1888-1975)

Preface

In order to determine eligibility for lectureship and to award Junior Research Fellowship (JRF) and to ensure minimum standards for the entrants in the teaching profession and research, National Eligibility Test (NET) is conducted in Humanities (including languages), Social Sciences, Forensic Science, Environmental Sciences, Computer Science and Electronic Science. This time Central Board of Secondary Education (CBSE) on behalf of UGC is holding the National Eligibility Test (NET). This is conducted twice in a year in the months of June and December. Junior Research Fellowship (JRF) is for candidates who desire to pursue research. The JRFs are awarded to the meritorious candidates from among the candidates qualifying for eligibility for lectureship in the NET. JRFs are restricted to only those candidates who opt for it in their application.

This notes presents teaching and research-based related topic with multiple choice questions . These strategies are based on the theory of multiple topic and brain-storming MCQ for each chapter, which can be usefull in examination like UGC/CBSE NET, SET, B.ED and other competitive examinations. No matter what the subject or grade level. Finally, its my request to reader for valuable suggestion to improve this notes, you can contact me below address

My facebook profile https://www.facebook.com/narayan.changder. Also i maintain dedicated facebook group for NET paper I (https://www.facebook.com/groups/ugccbse/). You can acess more MCQ from below website too. http://www.gatecseit.in/ugcnet/.

Paper I: consists of General paper on Teaching and Research aptitude. This paper aims to assess your capabilities in these prime areas which are foundation for Higher education teacher. Some cognitive abilities are expected from teachers and they are tested through this paper which consists of 100 marks. It contains Objective type questions from Teaching aptitude, Research aptitude, Reading Comprehension, Communication, Mathematical and logical Reasoning, Data Interpretation, ICT, People and environment, Higher Education System-Governance, Polity and Administration. Sixty (60) multiple choice questions of two marks are set in this paper, out of which you would be required to answer any fifty (50). If you attempt more than fifty questions, the first fifty questions attempted would be evaluated. For passing NET examination, you must require 40% marks in Paper I that is at least 20 questions in this paper should be correct. If you belong to OBC (Non creamy layer)/ PWD/SC/ST class than you need 35% to pass this paper I.

Note: If you get any wrong answer , please message me for further improvement of this notes. If you think any topic, which is not included in this notes , message me about it.

Contents

Chapter 1

Teaching aptitude

1.1 Introduction

Aptitude of any student is the internal ability or talent of the student which makes the difference with other student. One simply cannot cultivate aptitude rather aptitude of the student is totally depends on the practices. To be a strong in the aptitude , student must have enormous interest in the area in which they are interested. Teaching aptitude is totally depends on individual's interest towards teaching. To be a good teacher, one must have combination of behavioural characteristics as well as cultural characteristic. The person with real teaching aptitude must be curious, open-minded and obviously he/she must have in-depth knowledge of the subject, including love and faith for student.

1.2 What is teaching?

Teachers are the backbone of every society and they plays a vital role in nurturing the mind of the young child. The best teacher always gives knowledge and skills in very effective ways to young students. Teaching basically means interaction of teacher and students in an interactive way where both of them participate for their mutual benefits. Both the students and teacher can have their own objective and target. Throughout the world there are many great teachers defines teaching in different ways.

One word definition of teaching

The one word definition of teaching is just to train the students such that they can stands on their own foot in our modern society.

In teaching, three main aspects are as follows.

- Teacher
- students
- education

A true teacher is one with the following qualities

1. Teacher must identify the weak student in the class
2. Teacher live with the students mentally
3. Teacher must love the students
4. Teacher must identify knowledge of student and build the student on what they have

5. Teacher must give his own shoulder to his student for nurturing such that students can grow mentally and physically
6. Teacher must be friendly with his student up to a certain limit inside the classroom.
7. Teacher must be humorous inside classroom and as well as he/she must have capabilities to control the classroom.
8. A good teacher must have in-depth knowledge of the subject.

1.3 Role of a teacher

Teachers are the backbone of any society. There are several roles a teacher plays to make our society stronger. The way a teacher can lead students is varied from teacher to teacher. Teachers can plays the role in variety of ways either formally or informally. The following 10 roles are used by many of the teachers frequently to improve the students mentally, physically and socially. It is not only the case the teacher can be a human beings, a teacher can be any one for example nature can be a teacher for you if you learn something from the nature. Your mother is the best teacher for you because you learnt everything in childhood from your mother.

Role of a great teacher

Following are the role of a teacher.

1. **Resource provider**
2. **Instructional specialist**
3. **Curriculum specialist**
4. **Classroom supporter**
5. **Learning facilitator**
6. **Mentor**
7. **School leader**
8. **Data coach**
9. **Catalyst for change**
10. **Learner for lifelong**

1. **Resource provider :** a teacher must help their students and colleagues by sharing instructional resources. The instructional resources might include websites, any instructional documents, any new idea's, or other resources to use with the students.
2. **Instructional specialist :** an instructional specialist always helps colleagues to implement effective teaching strategies in the institution. For example if your students submits new laboratory reports written in very poor English-language, you invite some English teachers to recommend the strategies for writing the instruction in laboratory reports.
3. **Curriculum specialist :** Curriculum specialist must understand the standard of content in the syllabus, how various subjects of the curricula links together and how to use the curriculam such that students can understand better?.
4. **Classroom supporter :** Classroom supporters work inside classrooms to help teachers implement new ideas, often by demonstrating a lesson, co-teaching, or observing and giving feedback.
5. **Learning facilitator** Facilitating professional learning opportunities among staff members is another role for teacher leaders. When teachers learn with and from one another, they can focus on what most directly improves student learning. Their professional learning becomes more relevant, focused on teachers' classroom work, and aligned to fill gaps in student learning. Such communities of learning can break the norms of isolation present in many schools.
6. **Mentor:** Serving as a mentor for novice teachers is a common role for teacher leaders. Mentors serve as role models; acclimate new teachers to a new school; and advise new teachers about instruction, curriculum, procedure, practices, and politics. Being a mentor takes a great deal of time and expertise and makes a significant contribution to the development of a new professional.
7. **School leader:** Being a school leader means serving on a committee, such as a school improvement team; acting as a grade-level or department chair; supporting school initiatives; or representing the school on community or district task forces or committees. A school leader shares the vision of the school, aligns his or her professional goals with those of the school and district, and shares responsibility for the success of the school as a whole.

8. **Data coach:** Although teachers have access to a great deal of data, they do not often use that data to drive classroom instruction. Teacher leaders can lead conversations that engage their peers in analyzing and using this information to strengthen instruction.

9. **Catalyst for change:** Teacher leaders can also be catalysts for change. Teachers who take on the catalyst role feel secure in their own work and have a strong commitment to continual improvement. They pose questions to generate analysis of student learning.

10. **Learner for lifelong:** Among the most important roles teacher leaders assume is that of learner. Learners model continual improvement, demonstrate lifelong learning, and use what they learn to help all students achieve.

Roles for all Teacher's exhibit leadership in multiple, sometimes overlapping, ways. Some leadership roles are formal with designated responsibilities. Other more informal roles emerge as teachers interact with their students. The variety of roles ensures that teachers can find ways to lead that fit their talents and interests. Regardless of the roles they assume, teacher leaders shape the culture of their schools, improve student learning, and influence practice among their peers.

1.4 Teachers and their tasks

Teaching is a great profession throughout the world. The person who chooses teaching as a profession must believe that all the necessary qualities he must possesses to become an effective teachers. Moreover it is also mandatory that they must enjoy working with young kids and at the same time convinced that there effort will lead to betterment of society by nurturing the young kids. It is not a matter of fact that wherever the teacher is teaching, the teacher may teach in kinder garden or in universities. Teacher is typically confronted with the following task

1. Preparing students for learning new topic
2. Presenting learning activities
3. Asking questions to student
4. Monitoring the students learning
5. Giving the students feedback
6. Reviewing the students
7. Identifying the weak student
8. Re-teaching already taught topic
9. Taking the tutorial classes
10. Preparing the students notes
11. Preparing question banks

Task of a teaacher

In short the task of a good teacher outlined above encompasses the following points.

1. To bring the desired change in the learners behavior
2. To bring desired change in learners mind
3. To give the students sufficient knowledge about the subject
4. To enhance the skill of the student
5. Motivate the students to participate in social activities
6. Motivate the students to ask for any doubt in their mind
7. Motivate the students that they should not fear from teachers but rather they must be interactive and friendly up to a certain limit.

1.5 Characteristics of a Great/Good Teacher

It is an accepted fact that teachers are usually not born but made. Good teachers nurture their knowledge and skills through constant and deliberate efforts. One of the prerequisite to be good teacher is to understand the teaching learning process in more depth.

Greatness in teaching is just as rare as greatness in medicine, dance, law, or any other profession.Teaching is all about hard work and in this profession some teachers become a great teacher and they became the idol of their students and other teachers never grow to be anything better than mediocre. The great teachers, however, work endlessly to create a challenging, nurturing environment for their dear students. A great teaching seems to have less to do with the knowledge and skills than with our attitude towards our students, subjects, our work. Although this list is certainly not all-inclusive, i have narrowed down the many characteristics of a great teacher to those i have found to be the most essential, regardless of the age of the learner.

1. **A great teacher respects students:** a great teacher inside classroom must be friendly such that every student ideas and opinions are valued equally. Students must feel safe to express their thoughts and feelings and learn to respect and listen to others students. In a single word a great teacher classroom must be a welcoming learning environment for all the students.

2. **A great teacher creates a sense of community and belonging in the classroom :** A great teacher creates a small important community inside the class room. There must be a mutual respect in the classroom which provides a supportive and collaborative environment. In this small environment there are rules to follow and each student must be aware that they are important integral part of the group. A great teacher lets students know that they can depend not only on teacher, but also on the entire class.

3. **A great teacher sets high expectations for all students :** Student expectation must be hardly been a great teacher's classroom. Teachers must know that students generally ask questions or any doubt present in their mind.

4. **A great teacher has his own love of learning :** A great teacher always inspires his student with his passion for education and for the course material. Teacher constantly renews themselves as a professional to provide student with the high quality of education possible. Great teacher should not have any kind of fear of learning new teaching strategies for incorporating new technologies inside classroom.

5. **A great teacher is a skilled leader :** Different from administrative leaders, effective teachers focus on shared decision-making and teamwork, as well as on community building. This great teacher conveys the sense of leadership to students by providing opportunities for each of them to assume leadership roles

6. **A great teacher can "shift-gears":** A great teacher can "shift-gears" and is flexible when a lesson isnt working. This teacher assesses his teaching throughout the lessons and finds new ways to present material to make sure that every student understands the key concepts

7. **A great teacher collaborates with colleagues on an ongoing basis:** Rather than thinking of himself/herself as weak because he/ she asks for suggestions or help, this teacher views collaboration as a way to learn from a fellow professional. A great teacher uses constructive criticism and advice as an opportunity to grow as an educator.

8. **A great teacher maintains professionalism in all areas:** From personal appearance to organizational skills and preparedness for each day. His/ Her communication skills are exemplary, whether she is speaking with an administrator, one of her students or a colleague. The respect great teacher receives because of his/ her professional manner is obvious to those around him/her.

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 in 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 a tool to help student to adjust himself in society and its environment.

1.6 Method of teaching

Teaching is a very complex process which brings socially desirable behavioural change in a person. Teaching process takes place between teacher and learner. It is an interactive process which is initiated by the teacher where learner is the acceptor. In the process of teaching it is required to bring certain changes in a syudent according to the needs of the society where student is living. Teaching is dynamic in nature that's why it is called as a process. Teaching is both the science as well as art. In the process of teaching the main motive of the teacher is to develop the student mind. Effective teaching is mostly depend on the teacher. It is believed that a good teacher is born but not made. Training and research also can make a good teacher better and a better teacher best. Teacher must have the following qualities.

1. In-depth knowledge of the subject
2. Good knowledge of the pedagogical skills to teach the subject
3. Understand the learners preparedness with the knowledge

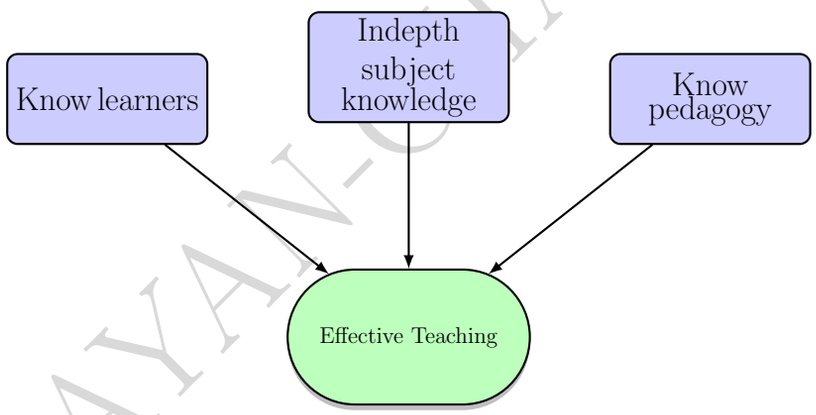


Figure 1.1: Teaching environment

Teacher should follow various methods of teaching devised from time to time. A teacher encourages the practice of thinking among students. Teacher should give to the students the freedom and opportunity to express their ideas.

The complete process of education must contain four common factors

1. Educator (teacher)
2. Educand (Student)
3. Subject matter
4. Context (setting).

1.6.1 Pedagogy paradigms

Pedagogy is the science and art of education. The aim of pedagogy is to develop the human beings up to the skill acquisition. The teaching is a professional artistry which requires a teacher to efficiently plan the objective and give the students meaningful knowledge in teaching-learning process. In the process of teaching, every teacher evolved themselves every day and they also develop their unique teaching style based on multiple encounters with their students. In teaching, every day teacher faced challenges and they loop for solution to those challenges. Pedagogical environment of teaching helps the teacher to understand the teaching-learning process and different

teaching strategies. The job of teaching is a complex process which is executed in a sophisticated phases. More or less there are four phases.

1. planning
2. execution
3. assessment
4. reflection

The entire process starting from planning to reflection is totally depends on the teachers choice and beliefs in the learning paradigm on how students learn. A teacher is able to change their learning plan if they use some teaching model to organize and implement teaching strategies. There are various methods of teaching as suggested by stewards in education system.

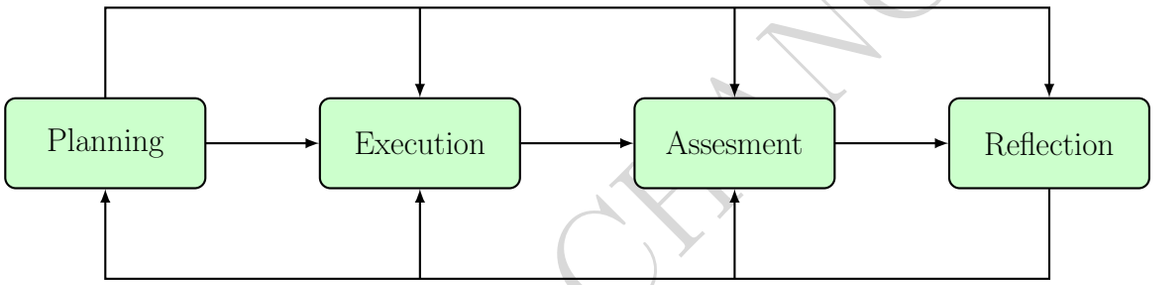


Figure 1.2: Executed sequence of phases

1.6.2 Recent trends in pedagogy Paradigm's

To be a successful teacher, a teacher must have to follow a model of teaching. A model of teaching is basically a plan or scheme prepared by teacher to organize instructional material which helps to implement teaching method and to achieve the goal of the curriculum. According to G.E. Miller "teaching method which plays learners in active learning situation are more likely to be effective than those which do not". There are various teaching methods available in the literature. The below table shows the central idea of the teaching method as described by various theorists.

In recent development of higher education, it is strongly believe that the process of learning is different from school to universities because students develop the intellectual power for learning. In the higher education, students become more autonomous and resourcefull, as a result in the higher education, students becomes experience learner. In the higher education, students becomes an independent learner by developing their positive learning habit and ultimately they becomes masters in their own learning process. Education is basically the process of developing some capabilities into an individuals. Though it is a fact that abilities are always inborn quality, but it is also a fact that these abilities can be nurtured and developed in an learner through various means by an educator. Education must also be relieved and useful from source site's point of view in which the learner is living. The productivity of education can be classified as qualitative and quantitative.

Current trends in Pedagogy paradigm's

Learner	Teacher	Teaching	Learning
All learners are different and unique	teacher is not a giver of the knowledge	teaching is an active engagement between learner and teacher	learning is an active discourse on the part of learner
all learners can learn	teacher is a facilitator who helps the learner to construct knowledge	teaching is a creative endeavor that requires flexible organization, modification and adjustment throughout the teaching-learning process	learning is fully experimental
learners construct their own knowledge	teachers personal beliefs, attitude and experiences affect the choice and style of teaching method	teaching has to differentiate in terms of choice of content, instruction, study materials and assessment to meet the diverse learning needs of the student	learning can be strengthened and maximized through appropriate scaffolding and by providing sufficient challenge
learners personal background, priority experience, interlaced and motivation contribute significantly to voice their ability to learn	teacher has to be a learner himself/herself to grow as a teacher and evolve themselves	teaching is successful in a stress-free, emotionally secure learning environment	learning can be an enriching experience in a collaborative setting where all learners are part of a learning community who are working together to achieve a common goal.

For better and effective education system both the qualitative and quantitative productivity is required. Here quality means the excellence in textbook, teaching aids, facilities and teachers. The following are the basic components of an effective teaching environment.

1. knowledge of the teacher and love of subject teacher is teaching
2. teacher must have the knowledge and love with affection for the students
3. there must be planning, preparation and organisation of the teaching method
4. teacher must be enthusiastic for teaching
5. teacher must have ability to stimulate the learner thought and interest.

There are total 150 teaching methods available in the literature suggested by theorists. Teaching methods can be classified into three broad categories

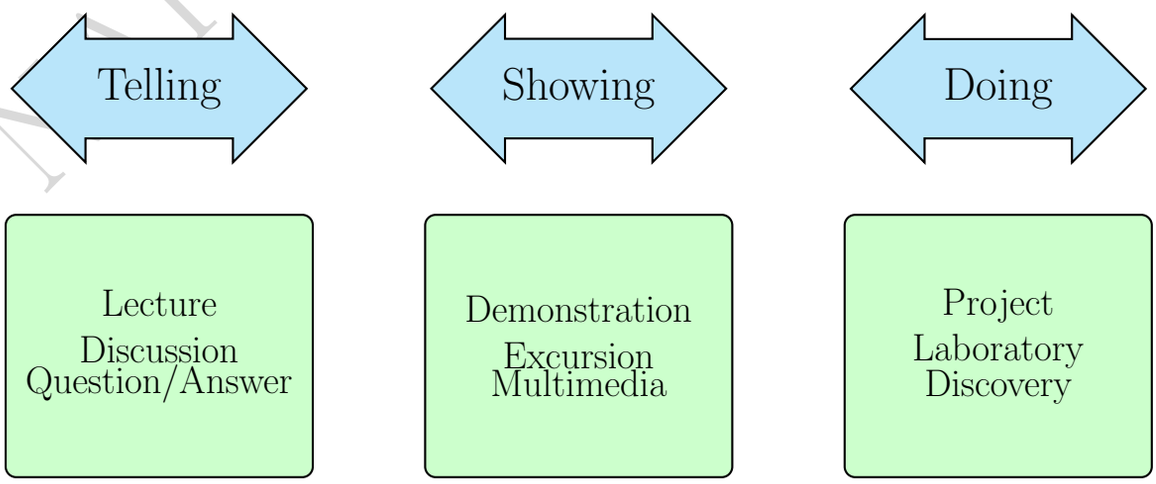


Figure 1.3: Methods of teaching

1.7 Traditional teaching method

In the ancient teaching method, the teacher was the sender or the source, the educational material was the information or message and students or learner was the receiver of that information. The educator deliver the message by using the chalk- and- talk method or by using overhead projector. Basically, the teacher controls the total instructional process, the content is delivered to the entire classroom at the teacher tends to emphasise factual knowledge. In this process, the teacher delivers the lecture content and the learner listened to the lecture. The main drawback in this method is the method is totally passive and the learners play a little role in the teaching-learning process. Some limitation which may prevail in traditional teaching methods are as follows.

1. Teaching in classroom using chalk and talk is “one way flow” of information.
2. Teachers often continuously talk for an hour without knowing students response and feedback.
3. The material presented is only based on lecturer notes and textbooks.
4. Teaching and learning are concentrated on “plug and play” method rather than practical aspects.
5. The handwriting of the lecturer decides the fate of the subject.
6. There is insufficient interaction with students in classroom.
7. More emphasis has been given on theory without any practical and real life time situations.
8. Learning through memorization but not understanding.
9. Marks oriented rather than result oriented.

1.8 Modern teaching method

Modern day choice of teaching method or methods to be used depends largely on the information or skill that is being taught, and it may also be influenced by the aptitude and enthusiasm of the students.

1.8.1 Lecture method

Lecture method is the most ancient method as prescribed by the theorists. Lecture method is still nowadays frequently used by teachers where a little or no participation from the learner side. A Lecture method will be effective if the teacher is experience and he is the master of the subject, explain all the points and can answer all the question raised by student. In this method student can ask questions anytime if they need any clarification. Efficiency of Lecture method totally depends on quantity of information, style of presenting information, clarity of information, active listening skills on the part of learners and supplementary material to provide a roadmap for the Lecture.

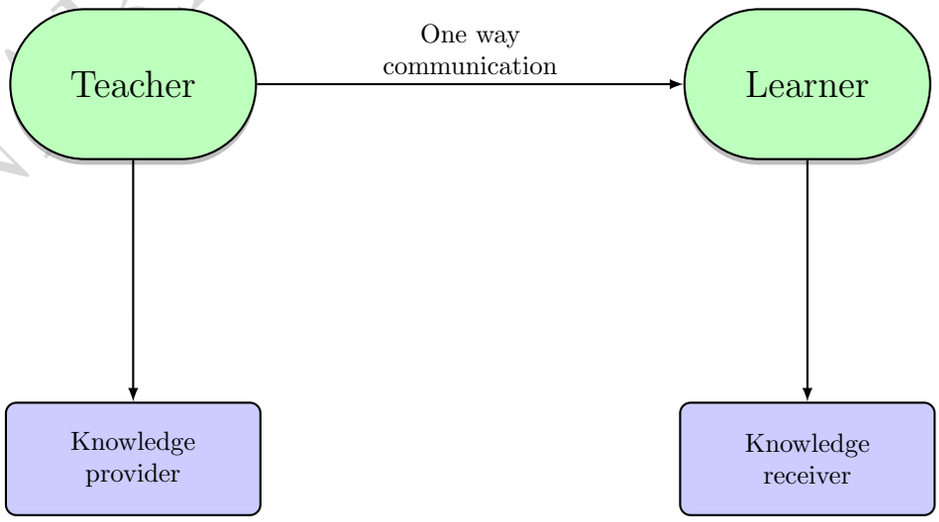


Figure 1.4: Teaching environment in lecture method

1.8.1.1 Advantage of lecture method

In the teaching-learning process following points are advantages of lecture method.

1. lecture method always good for large classroom and it also raise new ideas.
2. in lecture method students can ask questions anytime if they need any clarification about some particular topic.
3. in lecture method, a good teacher always explain all the points
4. teacher discusses old topic and complete the curriculam on time.
5. students can give their opinion at the end of each lecture
6. teacher can control and maintain the direct flow of the information with great interest.
7. it also stimulates the students interests by giving advanced knowledge of the topics
8. lecture method is useful because in this method a large amount of information can be provided to learner in a very short period of time.

1.8.1.2 Disadvantage of lecture method

Lecture methods of teaching is not fully armed with advantages. It has also some drawbacks

1. lecture method is totally undemocratic. In democratic country every person have some opinion to give by means of voting system. In the lecture method, if the teacher is rude, students don's feel safe to ask questions for clarification.
2. sometimes the learner becomes a silent receiver of information provided by teacher
3. lecture sometimes can be boring and unproductive if it is not organised properly.

1.8.1.3 Strategy to make lecture method more interesting

A teacher can make his lecture method interesting to the learners in different ways. Following are the different ways to make lecture method more interesting.

1. Give a roadmap or flowchart by using pointers and also indicates each and every point scale learners follow.
2. all the sequence of information must be rationally sound and logical from learners point of view
3. in any lecture method there must not be any communication gap between teacher and learner. So the language of the lecture should be clear and sharp.
4. for each and every topic there must be suitable example from real world problem.
5. lectures would start from brainstorming session on the topic which learners have already learned

1.8.2 Demonstration method

Demonstration teaching method is the best because in this method teacher shows the proof or explain the idea by using some example or experiment. This strategy is useful in technical or training Institute where practical knowledge is required. It is used to develop skill in the student and teacher. This method is very much useful for science and technology education. In this method of teaching students can visualise what is happening.

1.8.2.1 Advantage of demonstration method

Demonstration method of teaching has several advantages as shown below

- Because demonstration method shows the example or experiment. It is easy for student to visualise the sequence of process that may be hidden in the theoretical description.
- This method is the best to prove theorem accurately.
- Student can easily learn and understand the subject
- This method makes interest in the learners and motivate them for their active participation.
- This method makes teaching-learning process Interactive one

1.8.2.2 Disadvantage of demonstration method

Following are disadvantages of demonstration method

- This method can be used only for skills subject
- This method is totally teacher centric and mostly carried out in an laboratory
- This method is highly controllable
- To be a successful. This method requires accuracy and concentration to get the correct result

1.8.2.3 Strategies to make demonstration method more effective

- In this method, teachers would be a sincere, diligent and skilled person
- Teacher must come with the preparation of model
- Demonstration must be followed by healthy discussion
- Demonstrations would be repeated several times

1.8.3 Discussion method

Discussion is useful between a group of students or between a group of students and teacher. In teaching method, discussions involved stricter discipline and focus explanation of ideas, beliefs and understanding among a group of students on a chosen topic. Discussion Method emphasises pupil-activity in the form of discussion, rather than simply telling and lecturing by the teacher. Thus, this method is more effective.

1.8.3.1 Advantage of discussion method

- Everybody can participate in the discussion
- Democratic way of thinking is developed in the participant
- Students in the course of discussion get training in reflexive thinking
- Student can sell express themselves
- Students learn to discuss and differ with other members of the group. They learn to tolerate the views of others even if they are unpleasant and contradictory to each other's views. Thus, respect for the view points of others is developed.
- Learning is made Interesting

1.8.3.2 Limitation of discussion method

- All types of topics cannot be taught by Discussion Method.
- This method cannot be used for teaching small children.
- The students may not follow the rules of discussion.
- Some students may not take part while others may try to dominate.
- The teacher may not be able to guide and provide true leadership in the discussion.

In spite of these limitations, discussion method is a very useful and effective method for the teaching of History.

1.8.3.3 Strategies to make discussion method more interesting

- Topic of discussion must be selected from students interest point of view
- Student must come with the preparation for discussion.
- The teacher should act as an active moderator to allow discussion

1.8.4 Programmed instruction method

It is one of the improvised method of teaching invented by B.F Skinner. In this method, the responses of the students are fully controlled by the programmer or teacher. The main aspect of this type of teaching is to change the cognitive domain of the students beaviour. In this method, the students don't have any freedom to respond. There are many computer assisted program available in different subject

Program instruction type teaching is of three types

1. **Linear programming :** this is used to teach all the subjects. It is based on five fundamental principle.

   (a) small steps
   (b) actively respond
   (c) immediate confirmation
   (d) self pace
   (e) student testing

2. **Branched programming :** this method of teaching is used in mechanical field
3. **Mathematics:** in this method chain of elements is presented. First step is the master level, while the last step is the simplest element

1.8.4.1 Advantages of program instruction

Following are the advantages of program instruction teaching strategy

1. The main emphasis is on students involvement in the process
2. There is no fixed time interval for learning. Students can learn anytime
3. Students are exposed only for the correct responses.
4. Immediate confirmation of the result is provided to the student and also feedback to the wrong answer is provided.
5. This is totally technology based

1.8.5 Disadvantages of program instruction

1. It is very difficult to develop an instructional program
2. Only cognitive objectives can be achieved
3. This process is highly mechanical
4. There is no scope to invent or explore
5. Sometimes it may be very expensive

1.8.5.1 Srategies to make program instruction method interesting

1. Programmer must have good knowledge of the content
2. This method must be used as a quiz after the class
3. It should be used in distance education learning
4. If it is applied in a classroom, teacher must be present in the class

1.8.6 Heuristic method

Heuristic method is based on the trial and error theory of psychological principle. One of the prerequisite for this method is logical and imaginative thinking. This method is economical and very faster. In this method, teacher gives the learner questions and asks them to find out the solution by using various techniques like library, laboratory. This teaching strategy is totally focused on.

1. To develop problem-solving attitude of the student
2. To develop scientific attitudes towards the problem
3. To develop power of self-expression of students

1.8.6.1 Advantages of heuristic teaching method

Following are the advantages of heuristic teaching strategy

1. It helps in all round development of the learner
2. Students learn by self-expression means it develop self-confidence and self reliance in the students
3. It develop creativity and scientific attitude of the learners
4. Teacher always encouraged the students such that some new knowledge is discovered by the student

1.8.6.2 Disadvantages of heuristic method

1. This method cannot be used at primary education level
2. Students need higher intelligence to capture this method
3. Very few teachers have a sense to guard their students

1.8.6.3 Strategies to make heuristic method more interesting

1. One problem can have solution by using different method. So, it is totally teachers responsibility to guide the students and to select most relevant solutions of the problem
2. The problem given to the students must be related to the course and curriculam
3. There must be an eligibility criteria for distributing the problems to the student

In countries like India, Bangladesh, Nepal and Pakistan. The whole teaching examination method is totally examination oriented. Teachers don't have a sense to apply this teaching strategy and get the desired result

1.9 Teaching aid

A teaching aid is a tool used by teachers, facilitators, or tutors to help learners improve reading and other skills, illustrate or reinforce a skill, fact, or idea, and relieve anxiety, fear, or boredom.A teaching aid can be linguistic, visual , auditory or both. Teaching aid can be presented by using following rules:

1. Stimulation, role-play, drama, flim, documentary
2. Blackboard notes, PowerPoint presentation , web site resources.

The use of teaching aid in the learning process makes the teacher more resourceful, knowledgeable and versatile in his/her own style of teaching. Teaching aid can be used

1. To reinforce learning process
2. To strengthen the learning process
3. To highlight the important points in teaching-learning process
4. To enable students to visualise something which cannot be possible through regular teaching method

Classification of teaching aid

There are lots of teaching aids available in modern teaching Society. All the teaching aids can be categorised into two broad stream

1. Visual teaching aid
2. Interactive teaching aid

1.9.1 Visual teaching aids

Visual teaching aids are basically used to provide visual representation of subject matter to the learners in the form of pictures, graph, tables and photo clip. Visual teaching aids make teaching-learning process stimulating to the learners. These types of teaching aids are economic well and can be easily used by the teachers nowadays in modern societies needs.

1.9.2 Interactive teaching aids

Interactive teaching aids provide the learner visual images or audio clips or both to respond to the queries. In today's computer world, interactive teaching aids becomes more useful. Use of computerized interactive teaching aids has revolutionized teaching-learning process.

Types of teaching aids with examples

Visual teaching aids	Interactive teaching aids
Blackboard	interactive whiteboard
Charts	interactive projector
Posters	computer software
Newspapers	video conferencing
Flash card	interactive web resources
Board magazines	Digital presentations
Projector	
PowerPoint presentation	
Television/video/radio	

1.10 Teaching-learning Objectives

Objectives are statement which describe the learning outcomes expected to be achieved as a result of the teaching-learning process. In other words, objective can be defined in terms of change in the learners behaviour according to the need of the society where learner is living. We will use some of the terms interchangeably used for objective of teaching-learning process are:

1. Instructional objectives
2. Learning objectives
3. Desirable outcomes
4. Terminal objectives
5. Educational objectives
6. Competencies and aims

It is the teacher's duty to plan and write objective of teaching-learning process to make the teaching more organized and directed. To make the learning objectives, teacher must take into account what the learner will achieve as a result of engaging in learning activity. The objectivity of teaching-learning process must contain a behaviour, content, condition and criteria so that teachers can drive, in detail what is learned and how well student can learn it.

1.10.1 Purpose of objective

The objective in teaching-learning process has some defined purpose. Following are the few purpose of teaching-learning objectives.

1. Organization of the subject matter
2. Selection of effective instructional objectives
3. Selection of it is the teaching-learning materials
4. Planning the effective evaluation criteria
5. Consistent with curriculum goals
6. Made the appropriate teaching learning process to the levels of the learners
7. At last the objective must be goal directed

1.11 How to write a lesson plan

A lesson plan is a detail layout of the curriculum a teacher teaches in a given duration of time. A lesson plan makes teachers life easy by organizing the entire teaching-learning process to make the objectivity of teaching-learning process successful. Lesson plan determines the vision, aim of the teaching activity to be carried out by the teacher.A lesson plan is a careful detail plan of instructions about how teacher will teach the subject. An effective lesson plan includes the following steps to be performed.

1.11.1 preplanning

Preplanning means plan before teaching-learning process starts. Preplanning includes the following steps

1. Carefully scrutinize the subject matter to be taught by the teacher
2. Make a list of the important topics that teachers will teach
3. Make the topics in a sequence manner such that students feels comfortable in the whole teaching-learning process
4. Make a list of all the teaching aids that will be used in teaching-learning process
5. Clearly list all the resources and references that used in whole curriculam

1.11.2 Lesson opening

Before start the teaching, a teacher must have to start lesson opening process. Following rules are typically used.

1. Review all the materials that have been learned by learners
2. Introduced the lesson by connecting with the previous knowledge of the learners
3. State the objective of the topics such that students must know why they are learning the topics

1.11.3 Lesson layout

Lesson layout contains the following steps:

1. Provide details, step-by-step description of everything to be done
2. Detail description of the teaching strategies to be given to the learners such that they can come with the preparation
3. Plan different imaging approaches to meet the individual needs of learners. For example, one teaching method may be suitable for some students while others are not. So, a teacher must be aware of diverse teaching approaches.

1.11.4 Extended practice

To create a good lesson plan, it needs to follow the different steps that is called extended practice. Extended practice needs to follow the below steps

1. to strengthen the learning procedure, teacher needs to plan the different learning opportunities
2. Teacher must make sure that student can effectively grabs the lesson inside the classroom
3. It must give real-life context for wider application of the lesson learned

1.11.5 Closure of lesson

At the end of the day, teacher must have to review the following thing

1. Remove the key points of the lesson
2. Give learner pace to draw conclusions from the lesson
3. There must be some feature learning opportunities in lesson plan

1.12 Evaluation system

In any education system evaluation is a critical part. Evaluation basically means the judgement about the student by the teacher, but these judgement is really, really tough. Evaluation is an interwoven activity in the process of teaching and learning. Nowadays evaluation by using the multiple-choice questions type is better than the broad question.

1.12.1 Principles of evaluation

Student evaluation in the teaching-learning processes must be well planned, goal oriented and continuous. One piece of paper cannot evaluate a students abilty . So it is better that evaluation must be done inside the classroom throughout the semester. Following are some rules regarding evaluation.

- The process of evaluation should be informed properly to all the student
- Evaluation must be continuous process.
- Evaluation shuld be sensitive to learners and must not be biased .
- At the end of the day evaluation must be reliable judgement to student

1.12.2 Difference between evaluation and assessment

In teaching-learning process. The terms evaluation and assessment are used interchangeably, but there is some inherent difference between these to terms.

Assessment

Assesment is a preliminary phase in the evaluation process. A student can be assessed by using the multiple sources like class test, assignment, presentations, quiz, brainstorming session.

Evaluation

Evaluation is the action in the entire process that allows teachers to make a judgement based on assessment records with reference to learning objectives. Assessment without evaluation have no purpose. Following are the different evaluation techniques.

1. Written test
2. Classroom activities
3. Assignment
4. Project tasks
5. Laboratory activities
6. Social activities

Normally, there are four types of evaluation

1. Criteria referenced evaluation:
2. Formative evaluation
3. Norm referenced evaluation
4. Summative evolution

1.12.3 Evaluation and test

Test is the most widely used technique for evaluation in the education system and other recruitment system. The questions comes in test from some predefined syllabus and students have to give the answer to those questions in a predefined timeframe. There are mainly two kinds of test

1. Teacher made test
2. Standard test

Teacher made test is totally organised by teacher and questions are also set by teacher. Whereas standard test is for very large group where questions is prepared by some central comittee.

1.13 Solved excercises

The following questions have been designed to test the objectives identified for this chapter.

Solved Excercise

1. The most important function of a teacher is to
   - (A) facilitate learning
   - (B) manage instructional resources
   - (C) coordinate curricular activities
   - (D) provide information

2. It is popularly said that any two students are not alike. This implies that they differ in their
   - (A) physical and mental set up
   - (B) aptitude
   - (C) social status
   - (D) attitude

3. 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

4. Which of the following is not a type of the learned motives?
   - (A) Reflexes
   - (B) Habits
   - (C) Attitude
   - (D) Interest

5. Out of the following, in which lesson, a general rule is explained first and then examples are illustrated?
   - (A) Deductive lesson
   - (B) Inductive lesson
   - (C) Cognitive lesson
   - (D) Skill lesson

6. Counseling is provided to assist an individual
   - (A) To diagnose learning deficiencies
   - (B) To understand and solve problem
   - (C) To develop insight
   - (D) To develop the personality

7. The lowest level of Taxonomy of Educational Objectives of Cognitive Domain given by Bloom is

   (A) Knowledge

   (B) Comprehension

   (C) Application

   (D) Analysis

8. Instructional objectives are useful to

   (A) Teachers

   (B) Students

   (C) Question paper setters

   (D) All of the above

9. The objectives of a Curriculum are to be stated in terms of

   (A) Students entering behavior

   (B) Students terminal behavior

   (C) Teachers behavior

   (D) Learning process

10. Which of the following is a characteristic of a good test?

    (A) Validity

    (B) Reliability

    (C) Usability

    (D) All of the above

11. In which domain does the following objective fall? At the end of the lesson the learner should be able to hit the football using the head.

    (A) Affective domain

    (B) Cognitive domain

    (C) Psychomotor domain

    (D) A and C domains

12. During a visit to a second-grade classroom, a student teacher observed a child spending the time allotted for a worksheet either looking out the window or doodling on his paper. When the student teacher asked the child if he needed help on the assignment, he said no. When asked why he wasn't doing it, he pointed to another student and said, "She does all her work fast and when she's done, she gets more work." The boy's reaction suggests which of the following about his classroom?

    (A) A routine has been established for students who are having trouble finishing an assignment to ask the teacher for assistance.

    (B) A routine for rewarding students who finish work promptly is not in place.

    (C) Students must work alone on seatwork, without consulting other students.

    (D) Students who finish work before the whole class is finished must not interrupt the students who are still working

13. Most important work of teacher is
    - (A) to organize teaching work
    - (B) to deliver lecture in class
    - (C) to take care of children
    - (D) to evaluate the students

14. Gifted students are
    - (A) non-assertive of their needs
    - (B) independent in their judgments
    - (C) independent of teachers
    - (D) introvert in nature

15. Assessment for learning takes into account the following except
    - (A) mistake of students
    - (B) learning styles of students
    - (C) strengths of students
    - (D) needs of students

16. Which one of the following is an example of a fine motor skill?
    - (A) climbing
    - (B) hopping
    - (C) running
    - (D) writing

17. Which would be the best theme to start with in a nursery class?
    - (A) My best friend
    - (B) My neighborhood
    - (C) My school
    - (D) My family

18. In order to install a positive environment in a primary class a teacher should
    - (A) wish each child in the morning
    - (B) narrate stories with positive endings
    - (C) allow them to make groups on their own on the basis of Sociometry during group activities.
    - (D) not discriminate and set the same goal for every child.

19. Successful inclusion requires the following except
    - (A) involvement of parents
    - (B) capacity building
    - (C) sensitization

(D) segregation

20. The teachers and students in a school belong to a ..... system
    (A) Suprasystem
    (B) Subsystem
    (C) Interface system
    (D) Closed system

21. IQ scores are generally ..... correlated with academic performance.
    (A) least
    (B) perfectly
    (C) highly
    (D) moderately

22. An empowering school will promote which of the following qualities the most in its teachers?
    (A) tendency to experiment
    (B) memory
    (C) disciplined nature
    (D) competitive aptitude

23. A teacher should be
    (A) Honest
    (B) Diligent
    (C) Dutiful
    (D) Punctual

24. The most important objective of teaching is to
    (A) facilitate students when it comes to the construction of knowledge and understanding
    (B) cover the Syllabus timely
    (C) create a friendly environment inside the classroom or teaching-learning process
    (D) attend and takes the classes regularly and timely

25. Environmental education should be taught in schools because
    (A) it will affect environmental pollution
    (B) it is important part of life
    (C) it will provide job to teachers
    (D) we cannot escape from environment

26. The trial and error method of learning according to Thorndike could be classified as under

(A) The principle of multiple responses

(B) The law of exercise

(C) The principle of partial activity

(D) The principle of Associative learning

27. Liberalism in education, when it was claimed by universities of the world since the 19th century, meant

(A) Freedom to be given to education from the clutches of religion

(B) Favoring liberal education as opposed to special education

(C) Academic freedom for teachers in instruction

(D) Administrative freedom to universities to run the institution

28. The term 'Evaluation' and 'Assessment' could be discriminated as follows

(A) Assessment is limited to coverage achievement whereas evaluation is qualitative in character

(B) Evaluation is concerned with the effective aspects of achievement whereas assessment judges the cognitive aspects

(C) Evaluation involves the measurement as well as diagnosis of students' attainments, whereas assessment is concerned with only scholastic attainments.

(D) Assessment is an attempt to measure the pupil as whole whereas evaluation is concerned with his achievement only

29. Planning or arranging the student's environment in order to predict the consequences of a student's behavior is referred to as

(A) Prompting

(B) Reinforcement

(C) Shaping

(D) Stimulus control

30. Naturalism in education means

(A) Introduction of physical sciences in education

(B) Giving more importance to mind than to matter

(C) Making discrimination between mind and consciousness

(D) Supporting both mind and consciousness equally

31. Navodaya Schools have been established to

(A) increase number of school in rural areas

(B) provide good education in rural areas

(C) complete 'Sarva Shiksha Abhiyan'

(D) check wastage of education in rural areas

32. For developing the language abilities of kindergartners, which of the following would be the most appropriate way to follow up the writing of a group essay?

(A) Prepare a list of the most difficult words for the children to learn to spell.
(B) Show the children how to revise the sentences to make them longer and more complex structurally.
(C) Have the children print the essay for themselves, then practice writing it, using cursive letters.
(D) Read the essay aloud, in unison with the children, then leave it displayed where they can examine it

33. Theory of multiple intelligence implies the following except
(A) intelligence is a distinct set of processing operations used by an individual to solve problems.
(B) disciplines should be presented in a number of ways
(C) learning could be accessed through a variety of means
(D) emotional intelligence is not related to IQ

34. Smallest unit of meaning in a language is
(A) syntax
(B) morpheme
(C) pragmatics
(D) phoneme

35. A child cannot distinguish between 'saw' and 'was', nuclear' and 'unclear'. She/he is suffering from
(A) dyslexia
(B) word jumbling disorder
(C) dyslexemia
(D) dysmorphemia

36. Adolescents may experience
(A) feeling of self-actualization
(B) feeling of satiation about life
(C) anxiety and concern about themselves
(D) feeling of fear about sins committed in childhood.

37. Which theory of learning has found knowledge of internal processes crucial to the understanding of learning?
(A) Cognitive theorists
(B) Stimulus response theorists
(C) Operant conditioning theorists
(D) Classical conditioning theorists

38. A teacher can make problem-solving fun for students by doing all the following except
(A) providing open ended material
(B) giving time for free play
(C) providing endless opportunities for creative thinking
(D) expecting perfection from the students while they are trying to do things by themselves.

39. It is said that a teacher in the classroom is a
    - (A) Speaker
    - (B) Leader
    - (C) Friend
    - (D) Thinker

40. Some students are backward in studies. What will be your attitude towards them?
    - (A) Harsh
    - (B) Sympathetic
    - (C) Liberal
    - (D) Lovable

41. For harmonious development of the personality of the child, parent should
    - (A) overprotect the child.
    - (B) regularly compare the child with other children.
    - (C) provide conducive environment at home.
    - (D) engage qualified teachers.

42. Which of the following characteristics is most essential to make you a good teacher?
    - (A) Sympathy for students.
    - (B) Proficiency of language.
    - (C) Thoroughness of knowledge.
    - (D) Effective communication.

43. You have been selected in all the four professions given below. Where would you like to go ?
    - (A) Teacher
    - (B) Police
    - (C) Army
    - (D) Bank

44. learners can learn more effectively by
    - (A) listening the lecture
    - (B) noting the detailed written notes from the lecture
    - (C) actively participating in the lecture in interactive way
    - (D) all of the above

45. Vygotsky theory implies
    - (A) child will learn best in the company of children having IQ lesser than his/her own.
    - (B) collaborative problem solving
    - (C) individual assignments to each student

(D) after initial explanation, do not support a child in solving difficult questions

46. Which of the following plays a broad role for guiding the selection of teaching method?
    (A) The focus of learning
    (B) the strength of the entire class
    (C) content of teaching
    (D) all of the above

47. Which combination of teaching methods listed below would encourage the learner-centered paradigm?
    (A) Individualized instruction and lecture method
    (B) Simulation and demonstration
    (C) Lecture method and experimentation
    (D) Projects and Direct experiences

48. At primary level, it is better to teach in mother language because
    (A) it develops self-confidence in children
    (B) it makes learning easy
    (C) it is helpful in intellectual development
    (D) it helps children in learning in natural atmosphere

49. Women are better teacher at primary level because
    (A) they behave more patiently with children
    (B) they are ready to work with low salary
    (C) higher qualification is not needed in this profession
    (D) they have less chances in other profession

50. inside the classroom, before explaining the importance of topic, it is too important to
    (A) maintain strict discipline in the class
    (B) get the attention of the students
    (C) ask the students few questions from the last lecture
    (D) all of the above

51. If we believe in the dualistic theory of the mind versus body nature of man, have to arrive at the consequence that
    (A) Education is mechanization in process and theoretical in development
    (B) Learning is purely a matter of material changes in the behavior of man
    (C) Learning an education should cater to observable behavior of man
    (D) Education is purely a matter of mental training and development of the self.

52. Swami Vivekananda was famous for speaking on

(A) Vedas

(B) Medicians

(C) Gita

(D) Vedanta

53. Article 45 under the Directive Principles of State policy in the Indian Constitution, provides for

(A) Rights of minorities to establish educational institutions

(B) Free and compulsory primary education

(C) Education for weaker sections of the country

(D) Giving financial assistance to less advanced states

54. Vivekananda was a

(A) Religious guru

(B) Poet

(C) Philosopher

(D) All of the above

55. you are planning to teach human anatomy in a medical college. Which one of the following is the most suitable teaching aid?

(A) Put up a chart on human anatomy

(B) show the students model of the human body

(C) Read from the text and simultaneously explaining the topic

(D) show the presentation and videos depicting location and functions of parts of the human body

56. Which of the following teacher behavior suggests a dimension of "unsuccessful teacher behavior? A teacher who is

(A) Stimulating and imaginative

(B) Business like and friendly

(C) Aloof and routine

(D) Understanding and sympathetic

57. What is most important while writing on blackboard ?

(A) Good writing

(B) Clarity in writing

(C) Writing in big letters

(D) Writing in small letters

58. The industrial revolution that started in the West to begin with had the following effect on education

(A) Shifting the emphasis from the lower class culture to the middle class culture
(B) Shifting the centre of gravity from the middle to the lower class culture
(C) Introduction of mass educational programmes
(D) Introduction of vocationalisation of education

59. Any deterrents are negative in character
(A) When they prevent children from doing wrong
(B) When they prevent doing wrong but do not reform children
(C) When they are administered owing to some misunderstanding
(D) When they are administered with a negative motive

60. Which of the following kinds of instruction is frequently cited as the opposite of discovery learning?
(A) Simulation games
(B) Expository teaching
(C) Mastery learning
(D) Schema training

61. Industries near the towns cause
(A) Pollution
(B) Finished material
(C) Security
(D) Employment

62. 'Gang age' period refers to
(A) Infancy
(B) Preadolescent
(C) Teen age
(D) Adult

63. If you find a child in your class who always isolates from the rest of the class, you would ...
(A) ask the child to be normal by taking example of his classmates
(B) try to understand the underlying clause
(C) leave the child alone so that the child comes out of his own
(D) inform the management that his presence may effect other students of the class.

64. All of the following can be signs that a child is gifted, except
(A) Interest in encyclopedia and dictionaries
(B) Uneasy relationships with peers.
(C) Early development of a sense of time
(D) Easy retention of facts

65. With the frequent use of brain storming method the teacher develops

(A) Creativity

(B) Intelligence

(C) Perception

(D) Memory

66. In which stage is the Physical growth is rapid

(A) Early childhood

(B) Infancy

(C) Adolescence

(D) School age

67. The two factor theory of intelligence was proposed by

(A) Spearman

(B) Wechsler

(C) Piaget

(D) Binet

68. When a teacher ensures that students complete an exercise in mathematics and makes sure instructions are clear and specific. The teacher ensures the ..... aspect of assessment

(A) Validity

(B) Practicality

(C) Reliability

(D) Wash-back effect

69. Who said this, "Child should be treated as child."

(A) Rousseau

(B) Wechsler

(C) Binet

(D) Gagne

70. It is absurd to say that there can be

(A) A pollution due to noise

(B) Education causes pollution

(C) Transport vehicles cause pollution

(D) All of the above

71. Which of the following will not hamper effective communication in the class?

(A) An ambiguous statement
(B) A lengthy statement
(C) A precise statement
(D) A statement which allows the listener to draw his own conclusions

72. which of the following is most suitable method of teaching if focus of learning is to increase the skills
(A) demonstration
(B) discussion
(C) learning by self-study
(D) all of the above

73. Some students send a greeting card to you on teacher's day. What will you do ? You will
(A) do nothing
(B) say thanks to them
(C) ask them to not to waste money
(D) reciprocate the good wishes to them

74. A student comes late in your class. Then you will
(A) inform to parents
(B) punish him
(C) try to know the reason
(D) not pay attention there

75. the lecture method in a classroom is an effective way to
(A) introduce new concept
(B) introduce new skills
(C) if the mind the understanding of learners
(D) stimulate participation of learners

76. Which one is accountable in cooperative learning
(A) Individual
(B) Group
(C) Both A & B
(D) None of the above

77. What type of test is most effective when trying to test memorization?
(A) True / false
(B) Multiple choices
(C) Fill in blanks
(D) B and C

78. Cooperative learning is an alternative to
    - (A) competitive models
    - (B) Teaching models
    - (C) lesson plans
    - (D) Micro teaching

79. The number of students in cooperative learning groups are
    - (A) 3-4
    - (B) 5-6
    - (C) 8-10
    - (D) 10-15

80. The essential characteristic of cooperative learning is
    - (A) Effective learning
    - (B) Positive interdependence
    - (C) Cooperation
    - (D) Division of labor

81. The students like to spend the most of the time with
    - (A) Teachers
    - (B) parents
    - (C) Relatives
    - (D) Peers

82. Peer culture constitutes
    - (A) Socialization
    - (B) Individualization
    - (C) Both A & B
    - (D) None of the above

83. Which is not the advantage of team teaching
    - (A) Better utilization of resources
    - (B) Better planning
    - (C) Better use of teaching techniques
    - (D) Better financial benefits of teachers

84. The hypothesis underlying team teaching is
    - (A) Teachers feel bore while working alone
    - (B) Teachers are not competent
    - (C) The best teachers in schools are shared by more students

(D) The single teacher cannot control the class

85. Classroom management research findings suggest that one of the most effective ways to maximize the amount of time elementary school children spend on academic activities is for the teacher to do which of the following?

(A) Plan for, teach, and enforce routines for transition times and classroom housekeeping tasks.

(B) Assign homework three times a week in the major subjects.

(C) Assign individual reading on new topics before discussing the topic in class.

(D) Introduce new material in a lecture followed immediately by a questioning session on the material.

86. When the students become failed, it can be understood that

(A) The system has failed

(B) The teachers failure

(C) The text-books failure

(D) The individual student's failure

87. A teacher uses a text and some pictures of fruits and vegetables and holds a discussion with her students. The students link the details with their previous knowledge and learn the concept of nutrition. This approach is based on

(A) Classical conditioning of learning

(B) Theory of reinforcement

(C) Operant conditioning of learning

(D) Construction of knowledge

88. When a student takes the same test twice it is referred to as?

(A) Post-test

(B) Pre-test

(C) Test-retest

(D) After-test

89. A child starts to cry when his grandmother takes him from his mother's lap. The child cries due to

(A) Social anxiety

(B) Emotional anxiety

(C) Stranger anxiety

(D) Separation anxiety

90. The process whereby the genetic factors limit an individual's responsiveness to the environment is known as

(A) Discontinuity

(B) Differentiation

(C) Range of reaction

(D) Canalization

91. The term 'Mnemonics' is associated with
    - (A) Memory
    - (B) Amnesia
    - (C) cognitive behavior
    - (D) Anaemia

92. Frobels most important contribution to education was his development of the
    - (A) Public high school
    - (B) Latin School
    - (C) Vocational school
    - (D) Kindergarten

93. the learner always appreciate
    - (A) a concise and stimulating lecture
    - (B) A well researched and informative lecture
    - (C) a well organised and presentable lecture
    - (D) all of the above

94. It is advantage of giving home work that students
    - (A) remain busy at home
    - (B) study at home
    - (C) may be checked for their progress
    - (D) may develop habit of self study

95. Appetite and satiety centers of brain an present in
    - (A) Hypothalamus
    - (B) Cerebral hemisphere
    - (C) Cerebellum
    - (D) Medulla oblongata

96. The Indian Education Commission (1964-66) has recommended compulsory social service for school children as follows
    - (A) 20 days for the lower secondary stage and 20 days for the higher secondary stage
    - (B) 10 days for the primary stage and 30 days the secondary stage
    - (C) 30 days for the lower secondary and 20 days for the higher secondary stage
    - (D) 10 days for the lower secondary stage and 20 days for the higher secondary stage

97. All teachers should have a good ..... when they go into the classroom

(A) Plan
(B) Choice
(C) Attitude
(D) Class

98. When you put a question in the class to check the knowledge of students, the best method would be to
(A) Put more than one question at a time to stimulate students
(B) Frame the question as lengthy as you can
(C) To point to intelligent students first and then put the question
(D) To pose the question to the whole class and then select somebody to answer

99. Research is
(A) Data gathering
(B) Moving from a broad area to a narrow and focused area
(C) A systematic process of finding the truth
(D) Data gathering, processing and analysis

100. The theory of learning associated with connectionism was propounded by
(A) Socrates
(B) Pavlov
(C) Thorndike
(D) Kilpatrick

101. Evaluation in education insists on the following
(A) Making tests more reliable and valid
(B) Conducting periodical tests to detect students' weaknesses
(C) Insisting on clear cut behavioral objectives of teaching
(D) Examining students objectively for selection purpose

102. The main purpose of the first degree in our universities should be to
(A) Bring students to frontiers of knowledge and from there should be research
(B) Equip students with necessary competencies for different work experiences
(C) Prepare students for social service and bring them to the threshold of knowledge
(D) Bring to the frontiers of research with necessary equipment of knowledge

103. The idea of starting girls' University in our country started in the year 1970.
(A) As an initiative of the British rulers.
(B) Through the efforts of municipalities and local fund communities
(C) With the opening of the SNDT university at Bombay
(D) With the political awakening in the country by the push given by Mahatma Gandhi

104. In the introduction part of a lesson plan you get the student .....

(A) Assignments

(B) Previous knowledge

(C) Attention

(D) Abilities

105. A good communicator needs to be good at

(A) Speaking

(B) Listening

(C) The use of language

(D) The use of humor in speech

106. Which controls reflex action?

(A) Sympathetic nervous system

(B) Central nervous system

(C) Parasympathetic nervous system

(D) Sensory nerves

107. The National Educational Policy of 1979, recommended also about the public schools

(A) their uniquencies and traditions have to preserved the interests of the best talents of the country

(B) they should be brought under laws and regulations of the government public education system

(C) they must be allowed the autonomy that was bestowed on them by the past system of education

(D) suitable ratio has to be maintained for admission of middle class and poor student also.

108. Rama Krishna Mission was founded by

(A) Swami Dayanand

(B) Swami Vivekananda

(C) Raja Ram Mohan Roy

(D) Guru Nanak Dev

109. Annie Besant inspired the opening of schools in many cities in

(A) End of nineteenth century

(B) Early nineteenth century

(C) Early twentieenth century

(D) End twentieenth century

110. Critical pedagogy firmly believes that

(A) the learners need not reason independently

(B) what children learn out of school is irrelevant

(C) the experiences and perceptions of learners are important

(D) the teacher should always lead the classroom instruction

111. Considering that all behavior occurs in context, what is the possible source of behavior of a child who refuses to interact with the teacher and peers all the time?

(A) Materials being learnt are too simple or too challenging

(B) The child has a fight with the parents

(C) The child has been rejected or ridiculed by parents and adults

(D) The child does not understand

112. A teacher, after preparing a question paper, checks whether the questions test specific testing objectives. He is concerned primarily about the question paper's

(A) content coverage

(B) typology of questions

(C) reliability

(D) validity

113. School based assessment is primarily based on the principle that

(A) teachers know their learners' capabilities better than external examiners

(B) students should at all costs get high grades

(C) schools are more efficient than external bodies of examination

(D) assessment should be very economical

114. Learners display individual differences. So a teacher should

(A) provide a variety of learning experiences

(B) enforce strict discipline

(C) increase number of tests

(D) insist on uniform pace of learning

115. Which of the following is a principle of development?

(A) It does not proceed at the same pace for all

(B) Development is always linear

(C) It is a discontinuous process

(D) All processes of development are not inter-connected

116. Human development is divided into domains such as

(A) physical, cognitive, emotional and social

(B) emotional, cognitive, spiritual and social- psychological

(C) psychological, cognitive, emotional and physical

(D) physical, spiritual, cognitive and social

117. In ancient India religions and moral aims were dominated by

(A) Brahmnic system of education
(B) Kshatriya system of education
(C) Both A & B
(D) None of the above

118. What does the cognitive domain of Bloom's taxonomy of educational objectives affect in learners?
(A) Thoughts
(B) Emotions
(C) Skills
(D) All the above

119. The concept of totalitarian education in the West was in favor of
(A) Treating education as a binding factor of international understanding
(B) The education of the individual for development of his total personality
(C) Making the education of the individual as an instrument for realizing the ends of the state
(D) Making the state responsible to evolve education as a means of satisfying individual's needs and interests.

120. Regarding co-education at the secondary stage, the 1952-53 Education Commission has suggested that
(A) To start, resource, in several states could not afford
(B) There should be objection to extend co-educational school
(C) To maintain separate schools for boys and girls
(D) The situation in our country warrants establishment of more boys schools than co-educational school.

121. Who formed Brahmo Samaj
(A) Guru Nanak
(B) Kabir
(C) Ramanand
(D) Raja Ram Mohan Roy

122. A teacher has serious defect is he/she
(A) is physically handicapped
(B) belongs to low socio-economic status
(C) has weak personality
(D) has immature mental development

123. If a student is constantly rubbing his eyes and is inattentive during blackboard work he is having
(A) Adjustment problem
(B) Hearing problem
(C) Visual problem
(D) All of the above

124. Play therapy is adopted in the study of children in order to

A Make the educational process joyful

B To understand the inner motives and complexes of children

C Make education more activity centered

D Highlight the importance of play activities in education

125. What is the disadvantage of the project method of teaching?

A It is learner-centered

B Learners get firsthand knowledge

C The learners are not well supervised

D The learner's interest is considered

126. The most powerful barrier of communication in the classroom is

A Noise in the classroom

B Confusion on the part of the teacher

C Lack of teaching aids

D More outside disturbance in the class room

127. Nonformal Education is

A Provided by family, community, religion etc.

B Having no fixed curriculum

C Not motivated for acquiring knowledge

D Arranged by some organised body

128. Qualities essential to success in teaching are

A Adaptability, patience and alertness

B Dependence and indecisiveness

C Authoritarian attitude

D Materialistic bent of mind

129. School is an institution which has the function of

A Stratification on religious basis

B Stratification on economic class basis

C Social distance

D Socialization

130. The human interaction within a school may be described as a

A Social Position

B Social Hierarchy

C Social System

(D) Social Mobility

131. It is said that there is an urgent need of anticulation among schools and colleges, this problem of articulation is concerned with

(A) Provision of better administrative facilities

(B) Appointment of talented teachers

(C) Communication and closer relationship among teachers

(D) Better facilities for in-service training of teachers

132. The most important challenge before a teacher is

(A) To maintain discipline in the classroom

(B) To make students do their home work

(C) To prepare question paper

(D) To make teaching-learning process enjoyable

133. The idea that Basic Education is education through crafts

(A) True as far as the rural areas are concerned

(B) The whole truth of the schemes

(C) The complete truth even for urban areas

(D) True to some extent only because the concept is deeper

134. The term prejudice in a person is colored by

(A) A hasty judgment about a situation with an unfavorable

(B) Judgment and assessment of a situation without any favoritism

(C) Partial observation and acquaintance of a situation without any motives

(D) Pre-judgment of a situation with a view to settle a conflict in haste

135. The teachers should make constant efforts to situate the new information in the context of

(A) real-life experiences

(B) evaluation system

(C) previously learned information

(D) all of the above

136. Which of the following is not a characteristic of a slow learner?

(A) Limited vocabulary

(B) Short span of attention

(C) Abstract thinking

(D) Limited range of interests

137. The mean score on any class test is the result of

(A) dividing the sum of all scores by the number of scores

(B) determining the middle score when all the scores have been listed from the highest to the lowest

(C) determining the most frequent score.

(D) Adding all the scores and dividing by the most frequent score

138. The success of teacher is

(A) high achievement of students

(B) good traits of his/her personality

(C) his/her good teaching

(D) his/her good character

139. Inclusive Education

(A) celebrates diversity in the classroom

(B) encourages strict admission procedures

(C) includes indoctrination of facts

(D) includes teachers from marginalized groups

140. Which of the following is an objective question ?

(A) Short answer question

(B) Open ended question

(C) True or False

(D) Essay type question

141. Which of the following is a feature of progressive education ?

(A) Instruction based solely on prescribed textbooks

(B) Emphasis on scoring good marks in examinations

(C) Frequent tests and examinations

(D) Flexible timetable and seating arrangement

142. A teacher used the following statement to change the behavior of a student who was a smoker. “Smoking is healthy for the nation”. This is an example of

(A) Cognitive dissonance

(B) Conceptual conflict

(C) Meaningful learning

(D) Challenge

143. A child has been admitted to your school who belongs to a back ward family/background from the cultural viewpoint. You will

(A) Keep him in a class in which, there are many more students of backward background from the cultural viewpoint

(B) Send a teacher to know more about the backward cultural background of the child

(C) Keep him in a normal class but will make special arrangements for teaching him, keeping his special needs in view

(D) Advise him to take up vocational education

144. A Deepawali fair is being organized in your school. What would you like to do ?

(A) only to visit the fair

(B) to take part in function

(C) to take a shop to sell something

(D) to distribute free water to visitors

145. The least justifiable use of the results of a standardized reading test is to

(A) identify areas of pupil deficiency

(B) evaluate the reading instruction programme.

(C) Serve as a basis for report card marks

(D) Serve as the basis for a parent conference

146. A good teachers priority in his school shall be his

(A) Principal

(B) Secretary of the Managing Committee

(C) Colleagues

(D) Students

147. School is a social agency which

(A) Contributes to the raising of the society to a higher standard

(B) Conserves and transmits people

(C) Has certain biological endowments

(D) Isolates the good from bad

148. The academic aspects of education at school level are governed by

(A) U.G.C.

(B) N.C.E.R.T.

(C) N.E.P.A.

(D) N.C.T.E.

149. Tagore was a

(A) Philosopher

(B) Poet

(C) Musician

(D) Both A & B

150. The topic method in education should be interpreted

(A) a method of development of the syllabus in a subject

(B) a concentric approach of teaching the classroom

(C) a substitute for the project method of teaching

(D) a method suited better for arts subjects as compared to science subjects.

Probable answer key.

If you get any wrong answer please mail me at narayan.changder@gmail.com. I am still working on answer key. Dont only criticise, rather report right answer at above email or you can message me in facebook

Answers

1. A	2. A	3. A	4. A	5. A	6. B	7. A	8. D	9. B	10. D	11. C	12. B	13. A	14. B	15. A	16. D
17. D	18. D	19. D	20. B	21. C	22. D	23. C	24. A	25. B	26. B	27. C	28. C	29. D	30. A		
31. B	32. D	33. D	34. B	35. B	36. A	37. A	38. D	39. B	40. B	41. C	42. A	43. A	44. C		
45. B	46. D	47. D	48. D	49. A	50. B	51. D	52. D	53. B	54. C	55. D	56. C	57. A	58. D		
59. B	60. B	61. A	62. B	63. B	64. B	65. A	66. B	67. A	68. A	69. A	70. B	71. C	72. A		
73. B	74. C	75. A	76. C	77. D	78. A	79. A	80. B	81. D	82. A	83. D	84. C	85. A	86. D		
87. D	88. C	89. D	90. C	91. A	92. D	93. D	94. D	95. C	96. C	97. A	98. D	99. D	100. C		
101. C	102. A	103. C	104. C	105. C	106. C	107. D	108. B	109. A	110. C	111. C	112. D				
113. A	114. A	115. A	116. C	117. C	118. A	119. C	120. A	121. D	122. D	123. C	124. B				
125. C	126. B	127. B	128. A	129. D	130. C	131. C	132. D	133. D	134. A	135. C	136. C				
137. A	138. C	139. A	140. C	141. C	142. A	143. C	144. B	145. C	146. D	147. A	148. B				
149. D	150. C													

Chapter 2

Research methodology

Research basically means an art of scientific investigation. The definition of research varies according to different researchers. One such definition of research, according to Redman and Mory is *" research is a systematized effort to gain new knowledge"* This basically means Research is a walking from known thing towards unknown thing. It is basically a systematized process of discovery.

According to John W. Best *"research is considered to be the more formal, systematic intensive process of carrying on the scientific method of analyses. It involves a more systematic structure of investigation, usually resulting in some sort of formal record of procedure and a report of results or conclusions"*. The meaning of research is totally confined inside the word RESEARCH. If we analyze letter by letter, we will get

R : Rational way of thinking
E : Expert and exhaustive
S : Search for solution
E : Exactness
A : Analytical analyses of adequate data
R : Relationships of facts
C : Careful recording, critical observation and constructive attitude
H : Honesty

Definition of research

Here are some different definition of research given briefly

1. Research is an attitude of new discovery

2. Research is an attempt to redefine the facts.
3. Research is a scientific method
4. Research is friendly, welcoming attitude towards a change
5. Research is investigating something from known to unknown
6. Research means establishing new facts from known facts

2.1 Meaning and characteristics of research

Research is defined as the scientific investigation of phenomena which includes collection, presentation, analysis and interpretation of facts. In the book entitled " *research in education*" John W. Best and James says *"research is a more systematic activity that is directed towards discovery and the development of an organized body of knowledge. Research may be defined as the systematic objective analysis and the recording of control observation that may lead to the development of generalizations, principles, or theories, resulting in prediction and possibly ultimate control of events*"

The characteristics of research according to John W. Best and James V. Kahn are

1. Research is directed toward the solution of a problem.
2. Research emphasizes the development of generalizations, principles, or theories that will be helpful in predicting future occurrences. Research usually goes beyond the specific objects, groups, or situations investigated and infer characteristics of a target population from the sample observed. Research is more than information retrieval, the simple gathering of information.
3. Research is based upon observable experience or empirical evidence. Certain interesting questions do not lend themselves to research procedures because they cannot be observed.
4. Research demands accurate observation and description. Researchers may choose to use quantitative measuring devices when possible. When this is not possible or appropriate to answer the researchers question, they may choose from a variety of qualitative, or non quantitative, descriptions of their observations. Good research utilizes valid and reliable data gathering procedures.
5. Research involves gathering new data from primary or first-hand sources or using existing data for a new purpose. The students are expected to read a number of encyclopedias, books, or periodical references and to synthesize the information in a written report. Merely reorganizing or restating what is already known and has already been written, valuable as it may be as a learning experience, is not research. lt adds nothing to what is known.
6. Although research activity may at times be somewhat random and unsystematic, it is more often characterized by carefully designed procedures that apply rigorous analysis.
7. Research requires expertise. The researcher knows what is already known about the problem and how others have investigated it. He or she has searched the related literature carefully and is also thoroughly grounded in the terminology, concepts, and technical skills necessary to understand and analyze the data gathered.
8. Research strives to be objective and logical, applying every possible test to validate the procedures employed, the data collected, and the conclusions reached. The researcher attempts to eliminate personal bias. There is no attempt to persuade or to prove an emotionally held conviction. The emphasis is on testing rather than on proving the hypothesis.
9. Research involves the quest for answers to unsolved problems. However, previous important studies are deliberately repeated, using identical or similar procedures, with different subjects, different settings, and at a different time. This process is replication, a fusion of the words repetition and duplication. Replication is always desirable to confirm or to raise questions about the conclusions of a previous study.
10. Research is characterized by patient and unhurried activity. It is rarely spectacular, and researchers must expect disappointment and discouragement as they pursue the answers to difficult questions.
11. Research is carefully recorded and reported. Each important term is defined, limiting factors are recognized, procedures are described in detail, references are carefully documented, results are objectively recorded, and conclusions are presented with scholarly Caution and restraint. The written report and accompanying

data are made available to the scrutiny of associates or other scholars. Any competent scholar will have the information necessary to analyze, evaluate, and even replicate the study. Research sometimes requires courage. The history of science reveals that many important discoveries were made in spite of the opposition of political and religious authorities. The Polish scientist Copernicus (1473- 1543) was condemned by church authorities when he announced his conclusion concerning the nature of the solar system-. His theory, in direct conflict with the older Ptolemaic theory, held that the sun, not the earth, was the center of the solar system. Copernicus angered supporters of prevailing religious dogma, who viewed his theory as a denial of the story of creation as described in the book of Genesis. Modern researchers in such fields as genetics, sexual behavior, and even business practices have aroused violent criticism from those whose personal convictions, experiences, or observations were in conflict with some of the research conclusions

The chief characteristics of educational research as described by Lulla, Murty and Taneja in their book *"Essentials of Educational Research"* are presented below:

1. Educational research is highly purposeful, dealing with the problems of immediate and remote concern to the teachers and educationists.
2. Educational research follows a systematic process of investigation as precisely, objectively and scientifically as possible;
3. Educational research involves determination of the problem to be studied, formulation of hypotheses, gathering of information and necessary data from the concerned sources and using different tools of investigation;
4. Educational research employs scientific methods, objective procedures, logical arguments and inductive reasoning;
5. Educational research attempts to organize the data in quantitative or qualitative terms to arrive at statistical inference;
6. Educational research emphasizes the discovery of new facts or interpretation of known facts in a new perspective;
7. Educational research has some underlying philosophic theory;
8. Educational research depends on the ability, ingenuity and experience of the research for its conclusions and interpretations;
9. Educational research demands interdisciplinary approach to solve many of its problem;
10. Educational research demands subjective interpretation and deductive reasoning in some cases; and,
11. Educational research uses class-rooms, schools and departments of education as the laboratories for conducting experiments studies and surveys.

Characteristics of Research

Following are few important characteristic of any research

- **Empirical:** Research is based on direct experience or observation by the researcher.
- **Logical:** Research must be based on valid procedures and principles.
- **Cyclical:** Research is a cyclical process because it starts with a problem and ends with a problem. The result of research can be negative, positive or even nil.
- **Analytical:** Research utilizes proven analytical procedures in gathering the data, whether historical, descriptive, and experimental and case study.
- **Critical:** Research exhibits careful and precise judgment.
- **Methodical:** Research is conducted in a methodical manner without bias using systematic method and procedures.
- **Reliability:** The research design and procedures are replicated or repeated to enable the researcher to arrive at valid and conclusive results.

2.2 Qualities of a Good Researcher

To be a good researcher, one must have the following qualities.

1. Research-oriented
2. Efficient
3. Scientific
4. Effective
5. Active
6. Resourceful
7. Creative
8. Honest
9. Economical

2.3 Characteristics of the Researcher

To be a good researcher, one must have more or less the following characteristic.

1. **Intellectual Curiosity:** The researcher must take care of deep thinking and enquiry about the things and situation around the world
2. **Prudence:** The researcher is careful to conduct his research study at the right time and at the right place wisely, efficiently, and economically.
3. **Healthy Criticism:** The researcher is always doubtful as to the truthfulness of the results.
4. **Intellectual Honesty:** An intelligent researcher is honest to collect or gather data or facts in order to arrive at honest results.
5. **Intellectual Creativity:** A productive and resourceful investigator always creates new researches.

2.4 Classification of research

We can classify category of research in the following major groups. John W. Best and James V. Kahn have mentioned three different types of purposes of research. These are:

1. Fundamental research
2. Applied research
3. Action research

Educational research is further classified following four categories

1. Historical research
2. Quantitative descriptive research
3. Qualitative descriptive research
4. Experimental research

John W. Best and James V. Kahn say "Any attempt to classify types of educational research poses a difficult problem".

1. **Fundamental or basic research:** Fundamental research is also known as basis research. If the goal of the research is to find out the basic truth or principles, it is called as fundamental or basic research. This type of research is carried out in a laboratory or other sterile environment, sometimes with animals also. Examples of fundamental research is

   (a) Boyle's Law
   (b) Charle's Law
   (c) Archimede's Principle
   (d) Hooke's Law
   (e) Newton's Law

2. **Applied research:** most of the characteristics of fundamental research is found in applied research. This type of research involves finding new applications of scientific knowledge to the solution of a problem such as development of the new system, new device or new methods or tools in order to solve the problem. Mind it, most of the educational research falls under the category of applied research.
3. **Action research:** action research is used to solve an immediate application, not on the development of theory or general application. If the researcher finds any problem at time of his fields, investigation and observation, the researcher applies action research at that time
4. **Educational research:** According to John W. Best and James V. Kahn *"it should be noted that the system of classification is not important in itself but only has value in making the analysis of research processes more comprehensible"*. Educational research is directed towards the development of science of behavior in education situations .Practically, all studies fall under one, or a combination, of the following types.

(a) **Historical research:** Historical research talks about the past. In this type of research we need investigation, recording, analyzing and interpreting the events of the past for the purpose of discovering generalization.

(b) **Quantitative descriptive research:** This method is used to describe what is being described, recording, analyzing, and interpreting conditions that make this around ours. It is used to discover the relationship between non-manipulated existing variables.

(c) **Qualitative descriptive research:** This type of research use non-quantitative methods. This method of research is used to discover non-quantified relationship between existing variable.

(d) **Experimental research:** It describes "what will happen" in the future if certain variables are carefully controlled and manipulated. Main focus of this kind of research is to find out the relationship between variables

2.5 Steps of research

To do a research one have to keep in mind the research goal and its purposes. The technique of research needs different tools and instrument for gathering the data. Following are the steps to do research

1. Select the topic of candidate interest.
2. Exhaustive literature study
3. Formulation of the problem
4. Definition of the problem
5. Create own method/ Algorithm
6. Selection of the sample data
7. Data Collection, Data Processing, and Analysis
8. Correctly interpretation of the data
9. Testing the Hypotheses; Answering the Research Questions
10. Throwing of inferences or conclusions
11. Reporting of the research done that means the research report

2.6 What research can do in human life?

Research is an important part of today's modern human society. Without research, we cannot live our life with luxury. Following are the important points, which research can play in our daily life

1. Improvement of the quality of life is depends on the research
2. Any dream of students is achieved by research
3. Research improves the teachers Competency
4. Research reduces the man work power
5. Research satisfies needs of human being
6. Research improves the country's economy

2.7 The variable

Variable is defined as a quantity which is fluctuated its value under different conditions. In this section we will discuss different types of variable

1. **Independent and dependent variable:** Independent variable is chosen by the researcher to predict the relationship with observed phenomena. In an experiment, the independent variable is the variable that is varied or manipulated by the researcher, and the dependent variable is the response that is measured. An independent variable is the presumed cause, whereas the dependent variable is the presumed effect.
2. **Moderator variable:** this is a secondary or special type of independent variable chosen by the researcher to determine if it changes or modifies the relationship between the independent and dependent variables.
3. **Control variable:** This is the variable that is controlled by the investigator in which the effects can be neutralized by eliminating or removing the variable.
4. **Intervening variable:** This is a variable which interferes with the independent and dependent variables, but its effects can either strengthen or weaken the independent and dependent variables.

2.8 Standard of good research

Research activity is set to be standard or good if it satisfies some criteria as shown below

1. The skeleton of the research process must be carefully planned to get the output of the research.
2. A researcher should be frank to discuss things among colleagues.
3. The concepts used in research should be common
4. the purpose of the research must be clearly designed
5. For further advancement of research, one must give details about their research.
6. Careful attention must be needed to check the method of analysis
7. The analysis of data would be sufficiently adequate to reveal its significance in the research.

2.9 How to find the research problem

To find a good research problem, we must have to consider five factors to check whether the problem is researchable or not. The five factors are as follows.

1. All the existing problem in country or in the world, which don't have any known solution
2. Whether the solution can be obtained by using the statistical tools and techniques
3. There are lots of solutions available, but they are not yet tested physically
4. To conclude a solution, problem need scientific investigation.
5. Emergency needs or problems of the mankind where it demands research

2.10 Characteristics of any research problem

Not all the problem arises in universe a research problem. A research problem must have some characteristics. Following are the characteristics of a research problem. If any problem posses all these properties, then it is said to be a research problem.

1. **Specific:** The problem must be specifically tested
2. **Measurable:** The problem is easy to measure by using some research tool or equipment
3. **Achievable:** The data needs to do the research must be achievable using correct tools to get the final result
4. **Realistic:** The final result must be realistic and must reflect in the real world
5. **Time bound:** In all the activities of the research, there must be time bound because if the time span to complete an activity is smaller then it is obviously better

2.11 Sources of research problem

Though it is true that there are lots of research problem available in our world, but sometimes students failed to find a good research problem. Finding out the research problem is a big task for a researcher specifically, student. Following are important points, which must kept in mind to find out a research problem.

1. Specialization of the researcher(one have to take care about the specialization of the student)
2. what are the current scenarios in research and what have been done in past on that topic
3. One can take recommendation from previous theses or research reports.
4. Look after all the problems in the locality or in nation.

2.12 Criteria of a good research problem

Some research problem is said to be good, some are moderate and others not at all fits in current scenario. The research problem is said to be good if it has the following properties.

1. **Interesting:** research problem must be interested such that it attracts the students
2. **Innovative:** problem must be innovative, so that students can apply innovative idea in that problem to get the result.
3. **Cost-effective:** a good research problem must be economical
4. **Releavency:** Research problem must be relevant to the needs of people
5. Research problem must be relevant to the government, nation, and mankind.
6. **Timeliness:** An unbounded research problem is not feasible. There must be time bound in a good research problem.

2.13 Hypothesis

A proposition that can be verified to determine its reality is a hypothesis. A hypothesis may be defined as a logically conjectured relationship between two or more variables, expressed in the form of a testable statement. Relationship is proposed by using a strong logical argumentation. This logical relationship may be part of theoretical framework of the study. For example,

- Officers in my organization have higher than average level of commitment (variable).
- Level of job commitment of the officers is associated with their level of efficiency.
- Level of job commitment of the officers is positively associated with their level of efficiency.
- The higher the level of job commitment of the officers the lower their level of absenteeism.

There are different types of hypothesis which are as follows

1. Descriptive Hypothesis
2. Relational Hypothesis
3. Correlational hypotheses
4. Explanatory (causal) hypotheses
5. Null Hypothesis
6. Alternative Hypothesis
7. Research Hypothesis

Descriptive Hypothesis Descriptive hypothesis contains only one variable thereby it is also called as univariate hypothesis. Descriptive hypotheses typically state the existence, size, form, or distribution of some variable.

Relational Hypothesis These are the propositions that describe a relationship between two variables. The relationship could be non-directional or directional, positive or negative, causal or simply correlational. While stating the relationship between the two variables, if the terms of positive, negative, more than, or less than are used then such hypotheses are directional because the direction of the relationship between the variables (positive/negative) has been indicated. These hypotheses are relational as well as directional. The directional hypothesis is the one in which the direction of the relationship has been specified.

Non-directional hypothesis is the one in which the direction of the association has not been specified. The relationship may be very strong but whether it is positive or negative has not been postulated.

Correlational hypotheses It state merely that the variables occur together in some specified manner without implying that one causes the other. Such weak claims are often made when we believe that there are more basic causal forces that affect both variables. For example: Level of job commitment of the officers is positively associated with their level of efficiency.

Explanatory (causal) hypotheses It imply the existence of, or a change in, one variable causes or leads to a change in the other variable. This brings in the notions of independent and the dependent variables. Cause means to "help make happen." So the independent variable may not be the sole reason for the existence of, or change in the dependent variable.

Null Hypothesis It is used for testing the hypothesis formulated by the researcher. Researchers treat evidence that supports a hypothesis differently from the evidence that opposes it. They give negative evidence more importance than to the positive one. It is because the negative evidence tarnishes the hypothesis. It shows that the predictions made by the hypothesis are wrong. The null hypothesis simply states that there is no relationship between the variables or the relationship between the variables is "zero." . That is how symbolically null hypothesis is denoted as H_0. For example:

H_0 = There is no relationship between the level of job commitment and the level of efficiency. Or

H_0 = The relationship between level of job commitment and the level of efficiency is zero

Or the two variables are independent of each other. It does not take into consideration the direction of association (i.e. H_0 is non directional), which may be a second step in testing the hypothesis.

Alternative Hypothesis The alternative (to the null) hypothesis simply states that there is a relationship between the variables under study. In our example it could be: there is a relationship between the level of job commitment and the level of efficiency. Not only there is an association between the two variables under study but also the relationship is perfect which is indicated by the number 1. Thereby the alternative hypothesis is symbolically denoted as H_1. It can be written like this:

H_1 : There is a relationship between the level of job commitment of the officers and their level of efficiency

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Research Hypothesis Research hypothesis is the actual hypothesis formulated by the researcher which may also suggest the nature of relationship i.e. the direction of relationship.

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2.14 Solved excercises

The following questions have been designed to test the objectives identified for this chapter.

Solved excercises

1. When large groups of interconnected facts are considered together in a consistent manner, we get a
   - (A) Scientific Theory
   - (B) Critical Problem
   - (C) Combined Result
   - (D) Confirmed Fact

2. If in a research independent variables cannot be manipulated then it is known as

   (A) Experimental Research

   (B) Non-experimental Research

   (C) Fundamental Research

   (D) Exploratory Research

3. Which of the following is/are true about Expost Facto Study?

   (A) The investigators attempt to trace an effect which has already occurred to its probable causes

   (B) The effect becomes dependent variable

   (C) The investigators have no direct control over such variables

   (D) All of these

4. The per capita income of India from 1950 to 1990 is four times. This study is

   (A) Social

   (B) Horizontal

   (C) Longitudinal

   (D) Factorial

5. Which of the following is the most essential characteristic of a research worker?

   (A) Sympathy

   (B) Open mindedness

   (C) Patience

   (D) Emotional control

6. The decline of the British Empire should have spelt the decline of English. This statement is a/an

   (A) fact

   (B) advice

   (C) opinion

   (D) prejudice

7. To study the relationship of family size with income a researcher classifies his population into different income slabs and then takes a random sample from each slab. Which technique of sampling does he adopt?

   (A) Random Sampling

   (B) Stratified Random Sampling

   (C) Cluster Sampling

   (D) Systematic Sampling

8. Which of the following is the most read page of a thesis?

A Title page

B Table of contents

C Abstract

D Research Design

9. The historical research is different from experimental research in the process of

A Replication

B Formulation of hypothesis

C Hypothesis testing

D All of the above

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

A Sample parameter

B Inference

C Statistic

D None of these

11. Ordinarily a good piece of research follows four phases. They are given below

I Setting of objectives

II Analyzing data

III Collecting data

IV Interpreting the findings

Which of the following orders for these phases is correct?

A III,I,IV,II

B I,III,II,IV

C I,II,III,IV

D II,IV,III,I

12. Suppose you have a glass of milk and with a measuring glass you continue to add half a c.c. of plain tea at every step, till your friend reports a change in judgment in the color of the milk. The quantity of tea added, has just crossed what is just termed as

A Illusion

B Absolute Threshold

C Color Blindness

D Just Noticeable Difference

13. Suppose one Experimenter (E) in psychology firmly believes that Brahmin children are inherently superior to the Harijan children. Naturally he would never think of home environment as an explanation. This is a very obvious example of

(A) Experimenter's Bias

(B) Subjects Bias

(C) Stimulus Error

(D) Response Error

14. Which one of the following approaches tries to analyze human behavior in terms of stimulus-response units acquired through the process of learning, mainly through instrumental conditioning?

(A) Cognitive Approach

(B) Dynamic and Psychoanalytic Approach

(C) Stimulus-Response-Behaviouristic Approach

(D) Existential Approach

15. The approach which has its roots in Gestalt Psychology is popularly known as

(A) Holistic Approach

(B) Stimulus-Response-Behaviouristic Approach

(C) Dynamic and Psychoanalytic Approach

(D) Cognitive Approach

16. Which approach emphasizes the role of instinctual processes and their modification in the course of interaction with the society?

(A) Dynamic and Psychoanalytic Approach

(B) Cognitive Approach

(C) Holistic Approach

(D) Stimulus-Response-Behaviouristic Approach

17. Which approach placed emphasis on human existence–the need to establish a sense of personal identity and to build meaningful links with the world?

(A) Cognitive Approach

(B) Dynamic and Psychoanalytic Approach

(C) Holistic Approach

(D) Existential Approach

18. Existentialism tries to reach modern man, offer him help in terms of clarifying his values, work out a meaningful and purposive existence. Psychologists who shaped this approach were

(A) Rollo May, R. D. Laing and Erick Fromm

(B) G. W. Allport, R. B. Catell and H. J. Eysenk

(C) Erickson and Sullivan

(D) Piaget, Bruner and Witkin

19. The system which still survives very nearly in its rigid forms is

(A) Cognitive Approach

(B) Dynamic and Psychoanalytic Approach

(C) Wholistic Approach

(D) Existential Approach

20. Which approach tells us that under normal conditions the Organism is not a passive recipient of stimuli but an active, seeking and striving entity trying to master the environment and also master itself?

(A) Organism, Wholistic and Self Approaches

(B) Dynamic and Psychoanalytic Approach

(C) Cognitive Approach

(D) Existential Approach

21. Psychologists are sometimes interested to study consciousness even though they have no method of observing it directly except by using

(A) "Inference" as the only tool

(B) "Experimentation" as the only tool

(C) "Observation" technique

(D) "Introspection" technique

22. The term "unconscious motivation" describes the key idea of

(A) Structuralism

(B) Functionalism

(C) Psychoanalysis

(D) Behaviorism

23. The psychologists who are especially concerned with increasing the efficiency of learning in school by applying their psychological knowledge about learning and motivation to the curriculum are popularly known as

(A) Experimental Psychologists

(B) Clinical Psychologists

(C) Physiological Psychologists

(D) Educational Psychologists

24. ASccording to Lindquist, how many types of experimental designs possible

(A) five

(B) six

(C) seven

(D) eight

25. Who of the following has edited a survey of educational research ?

(A) Kothari
(B) Buch
(C) Yashpal
(D) Aryabhatta

26. The polluted facts can lead to the birth of
(A) Error free research
(B) human sorrows
(C) good research
(D) polluted research

27. Photocopy of books is not considered appropriate, as it is
(A) violation of intellectual property
(B) difficulty for reading
(C) and act of plagiarism
(D) both B and C

28. The research papers are written to
(A) communicate the research
(B) become popular in the society
(C) gain a lot of money
(D) none of the above

29. Which one of the following generally does not participate in concurrence?
(A) intelligent and curious person
(B) ignorant and dull persons
(C) highly expert person in that field
(D) low quality research scholars

30. In the assessment of personality, the normative and objective method refers to
(A) The use of sophisticated techniques for measuring the accuracy of a person's perception of reality.
(B) Prediction of behavior on the basis of intensive interviewing.
(C) Prediction of behavior on the basis of data from personality tests.
(D) The use of projective techniques.

31. Which is the best format to use if content and material gathered for certain number of students by different interviews have to be compared in a piece of research ?
(A) Projective
(B) Structured
(C) Unstructured

(D) Analytical.

32. What best describes the Likert technique of attitude measurement?

(A) Subjects indicate whether they agree with each of a series of attitude statements which are equally spaced along an attitude continuum

(B) Subjects indicate on five point scales the extent of their agreement with a set of attitude statements

(C) Subjects judge a particular concept on a series of bipolar semantic scale

(D) Subjects response to an open-ended interview are coded by content analyst.

33. What can increase the power of a statistical test?

(A) Decreasing the size of the sample

(B) Avoiding the use if the null hypothesis

(C) Designing for small error effects

(D) Avoiding random sampling.

34. Which is not the effective way of controlling a nuisance variable in an experimental design?

(A) Excluding the variable as one of the factors in the experiment

(B) Exercising statistical control

(C) Random assignment of subjects

(D) Holding the nuisance variable constant for all subjects.

35. What are the types of Descriptive Research?

(A) Survey Test

(B) Questionnaire Survey

(C) Interview Survey

(D) All of the above .

36. Who has defined Ex-Post Facto Research by saying that it is a systematic scientific exploration in which the scientist (researcher) does not have direct control on the independent variable?

(A) Fred Karlinger

(B) George J. Mouly

(C) John W. Best

(D) W.S. Monroe.

37. What are the types of variables?

(A) Independent variables

(B) Controlled variables

(C) Both of them

(D) None of these.

38. What is the difference between Laboratory Experiment and Field Experiment?

A Difference of place

B Difference of samples

C Difference of variables

D All of the above .

39. Which experiments are more popular in Educational Psychology?

A Laboratory Experiments

B Field Experiments

C Field Studies

D Historical Researches.

40. In some developed countries like U.S A. and U.K. many psychologists are engaged for diagnosing learning difficulties and trying to remedy them. These psychologists are popularly called

A School Psychologists

B Social Psychologists

C Experimental Psychologists

D Industrial Psychologists

41. Today, private and public organizations also apply psychology to problems of management and employee training, to supervision of personnel, to improving communication within the organization, to counseling employees and to alleviating industrial strife. The applied psychologists who do this work are sometimes called

A Personnel Psychologists

B Organizational Psychologists

C Experimental Psychologists

D Social Psychologists

42. A person who uses the particular psychotherapeutic techniques which originated with Sigmund Freud and his followers is called

A A psychoanalyst

B A psychiatrist

C A child psychologist

D A clinical psychologist

43. Finding the causes of behavior from a number of observations is called

A Inductive reasoning

B Observational technique

C Deductive reasoning

D Introspection

44. The clinical method is ordinarily used only when people come to psychologists with

A Social problems

B Personal Problems

C Organizational problems

D Internal problems

45. The technique of regulating various variables in an experiment is called

A Independent Variable

B Dependent variable

C Experimental control

D Controlled variable

46. Psychologists with the Biological perspective try to relate behavior to functions of

A Body

B Mind

C Soul

D Unconscious

47. A little girl Leny pushed Bapula, her brother, off his tricycle. She learned to behave this way because the behavior paid off in the past, in other words, she learned to act aggressively in certain situations because she was rewarded for such behavior in the past. With which perspective, a psychologist can study this type of problem?

A Biological Perspective

B Behavioral Perspective

C Cognitive Perspective

D Social Perspective

48. The perspective which is concerned with characteristic changes that occur in people as they mature is known as

A Developmental Perspective

B Biological Perspective

C Humanistic Perspective

D Psychoanalytic Perspective

49. A person's sense of self is emphasized by

A Psychoanalytic Perspective

B Biological Perspective

C Developmental Perspective

50. A key psychodynamic idea is that when unconscious impulses are unacceptable or when they make us anxious; to reduce anxiety, we use

(A) Defense Mechanisms

(B) Super ego

(C) Instincts

(D) Dreams

51. The distinction between a clinical psychologist and a psychiatrist is that

(A) A clinical psychologist normally holds a Ph.D. or M.A. degree or Psy. D. (Doctor in Psychology) and a psychiatrist holds an MD degree

(B) A clinical psychologist holds a Ph.D. degree in Psychology and a psychiatrist holds both Psy. D. degree and Ph.D. degree

(C) A clinical psychologist holds a special degree in Psychology and a psychiatrist holds a Ph.D. degree in Psychology

(D) A clinical psychologist has a special training in psychotherapy and a psychiatrist holds M.A. degree in Psychology

52. The Subject "Psychology" was formally recognized in Germany in the year

(A) 1789

(B) 1668

(C) 1879

(D) 1897

53. To study Abnormal Psychology means, to study mainly the nature of

(A) Conscious Mind

(B) Unconscious Mind

(C) Subconscious Mind

(D) Normal Mind

54. Sigmund Freud is regarded as the father of

(A) Psychoanalysis

(B) Behaviorism

(C) Functionalism

(D) Gestalt Psychology

55. The unit of Sociology is the 'Group', whereas the unit of Psychology is the

(A) Stimulus

(B) Individual

(C) Animal

(D) Institution

56. The branch of psychology which (teals with the study of animal behavior is known as

A Social Psychology

B Abnormal Psychology

C Differential Psychology

D Comparative Psychology

57. The father of 'Experimental Psychology' is

A Wilhelm Wundt

B Sigmund Freud

C C.G. Jung

D E. B. Titchener

58. Hypothesis refers to

A The outcome of an experiment

B A conclusion drawn from an experiment

C A form of bias in which the subject tries to outguess the experimenter

D A tentative statement about the relationship

59. Statistics is used by researchers to

A Analyze the empirical data collected in a study

B Make their findings sound better

C Operationally define their variables

D Ensure the study comes out the way it was intended

60. An observation of a dependent variable response prior to any attempt to change this response is known as the .....

A Flat line

B Baseline

C Variance

D Reverse

61. The most frequently used quasi-experimental design is the ..... design.

A Nonequivalent comparison-group

B Interrupted time-series

C Changing-criterion

D Regression discontinuity

62. A baseline .....

A Is used as the standard against which change induced by the treatment is assessed

B Is the occurrence of a response in its freely occurring or natural state

C Is first obtained prior to the administration of a treatment

D All of the above are true

63. A single-case experimental design in which the response to a treatment is compared to baseline occurring before and after the treatment is called what?

    A Single-case design

    B Multiple-baseline

    C Changing-criterion

    D None of the above

64. A literature review requires

    A Planning

    B Good & clear writing

    C Lot of rewriting

    D All of the above

65. Which of the following is true about good hypotheses?

    A It is formulated in a way such that it can be tested by the data

    B There is a limited scope and it should not have global significance

    C It is precise, specific and consistent with most known facts

    D none of the above

66. Which of the following is true about footnote?

    A it is essential in report writing

    B it is not much essential in the report writing

    C it is not at all essential in report writing

    D it is never used in report writing

67. While editing primary data, we have just to notice the information contained in the questionnaire is

    A Homogeneous

    B consistent

    C complete

    D All of the above

68. Which of the following statements is correct about validity and reliability?

    A When internal validity is high, external validity is low

    B When internal validity is high, there is no change in external validity

    C When internal validity is high, external validity is also high

    D All of the given options

69. In a single-case design, you hope that the behavior of the participants prior to the administration of a treatment condition is .....

(A) Not highly variable
(B) Highly variable
(C) Moving at a steep rate of change
(D) None of the above

70. Which design would use analysis of covariance during data analysis?
(A) Nonequivalent comparison-group design
(B) Interrupted time-series design
(C) Changing criterion design
(D) All of the above

71. For the first time, the word 'Psychology' was used by
(A) Rudolf Goeckle
(B) Sigmund Freud
(C) William James
(D) E. B. Titchener

72. The literal meaning of 'Psychology' is
(A) Science of Behavior
(B) Science of Soul
(C) Science of Consciousness
(D) Science of Mind

73. Rudolf Goekle used the word 'Psychology' for the first time in
(A) 1590 AD
(B) 1950 AD
(C) 1095 AD
(D) 1509 AD

74. Psychology as the 'Science of Mind was defined by
(A) Psychoanalysis
(B) Behaviorists
(C) Functionalists
(D) Ancient Greek Philosophers

75. Scientific Psychology came into existence during
(A) 19th Century
(B) 20th Century
(C) 18th Century
(D) 17th Century

76. E. B. Titchener (1867-1927) defined 'Psychology' as the science of
    - (A) Soul
    - (B) Mind
    - (C) Experience
    - (D) Conscious Experience

77. J. B. Watson defined 'Psychology' as the science
    - (A) Soul
    - (B) Behavior
    - (C) Mind
    - (D) Consciousness

78. Psychology was defined as the "Science of Behavior" by
    - (A) Functionalists
    - (B) Structuralisms
    - (C) Gestalt Psychologists
    - (D) Behaviorists

79. Who defined 'Psychology' as the scientific study of activities of the organism in relation to its environment?
    - (A) J. B. Watson
    - (B) Sigmund Freud
    - (C) C. G. Jung

80. Any systematically organised body of verified knowledge about a certain class of facts and events is known as
    - (A) Science
    - (B) Experiment
    - (C) Hypothesis
    - (D) Fact

81. Psychology is
    - (A) A social Science
    - (B) A Natural Science
    - (C) A Biological Science
    - (D) Both Natural and Social Science

82. Why is it important to change one variable at a time in single case designs?
    - (A) Changing one variable allows isolation of the cause of the change
    - (B) Changing more than one variable at a time confounds those independent variables
    - (C) Both A and B are true
    - (D) None of the above

83. Researchers can attempt to eliminate the threat of bias from the selection-maturation effect in the nonequivalent comparison-group design by matching experimental and control participants on important variables.

A True

B False

84. Group comparison designs are always superior to single-case designs.

A True

B False

85. When you are confident that the experimental manipulation produced the changes you measured in the dependent variable, your study probably has good ..... validity.

A Internal

B External

C Causal

D Construct

86. Identifying a factor to be measured by placing units or categories on a scale to differentiate varying degrees of that factor and describing these units in some manner is known as

A A checklist.

B A schedule,

C A test.

D A rating scale.

87. If a researcher conducts a research on finding out which administrative style contributes more to institutional effectiveness, it is an example of

A Basic research.

B Action research.

C Applied research.

D Fundamental research.

88. In case of ANOVA if there are no treatment effects at all, then F-ratio will be

A Zero.

B +1.0.

C -1.0.

D Any value between 1.0-1%.

89. What is the nature of F-test?

A Essentially a two-tailed test

B Essentially a one-tailed test

C Can be one-tailed as well as two-tailed depending on the hypothesis to be tested

D Can never be a one-tailed test.

90. Who developed Method of equal appearing intervals forming the basis of constructing attitude scales?

(A) Likert

(B) Thurstone and Chave

(C) Bogardus

(D) Guttman.

91. What is an attitude scale with five points on it varying from strongly approved to strongly disapproved?

(A) Likert type

(B) Thurstone type

(C) Bogardus type

(D) Guttman type.

92. What is an attitude scale in which each item's value is calculated by finding out the mean or median of the ratings of a large number of judges on an eleven-point rating scale?

(A) Thurstone type

(B) Guttman type

(C) Bogardus type

(D) Likert type.

93. Which of the following situations calls for the use of a ratio-scale?

(A) A researcher waits to assert that the two persons X and V differ in their attitudes towards nationalization of education

(B) He wishes to state that the attitude of one person 'X' is more favorable than that of 'Y'

(C) He wishes to make a statement that as compared to Y, 'X' is much more in favor of nationalization than he is, as compared to 'Z'

(D) He wants to show that 'X' is twice as much in favor of Nationalization as 'Y'.

94. Which one of the following is regarded as the very breath of an experiment?

(A) Independent Variable

(B) Dependent Variable

(C) Controlled Variable

(D) Experimental Control

95. Mr. Ali has conducted an extensive review of the literature and has deductively reasoned a hypothesis about his problem on the basis of this review. Which type of a research plan is Mr. Ali likely proposing?

(A) Qualitative

(B) Ethical

(C) Both quantitative and qualitative

(D) Quantitative

96. The directors of a graduate program in educational research wish to see what types of jobs their graduates take after they finish their program. They randomly sample students from the program and have them fill out questionnaires with items asking about the types of jobs they have had. They also are asked to describe the roles they play in their current positions. This project is best described as having what kind of objective

    A Descriptive

    B Predictive

    C Explanatory

    D None of the above

97. When research is done to test hypotheses and theories about how and why phenomena operate as they do, then the primary purpose of such research is

    A Descriptive

    B Predictive

    C Explanatory

    D None of the above

98. The variable the researcher matches to eliminate it as an alternative explanation is called a(n) ..... variable

    A Matching

    B Independent

    C Dependent

    D Partial

99. Which of the following is not a longitudinal design?

    A Panel

    B Cross-sectional

    C Trend

    D Both A and C are longitudinal designs

100. Researcher selects only 25 members as a sample from the total population of 20,000, and considers

    A He was guided by his supervisor

    B He was a good researcher

    C The population was Homogeneous

    D None of the above

101. The title page of a research synopsis must be

    A attractive

    B organised

    C aesthetic

    D logical

102. The positive correlation between teachers' salaries and the price of liquor is.....

(A) Spurious
(B) Due to a third-variable
(C) Nonspurious
(D) Both A and B

103. Which of the following is considered a special case of the general linear model?
(A) A variable
(B) Partial correlation
(C) Analysis of covariance
(D) Both B and C

104. When a researcher starts with the dependent variable and moves backwards, it is called .....
(A) Predictive research
(B) Retrospective research
(C) Exploratory research
(D) Descriptive research

105. The method of working multiple hypotheses refers to a technique for identifying rival explanations.
(A) True
(B) False

106. GLM refers to which of the following?
(A) General Logic Model
(B) General Limited Model
(C) General Lab Model
(D) General Linear Model

107. In which of the following year Council of scientific and industrial research Society was constituted as an autonomous society
(A) 1940
(B) 1942
(C) 1962
(D) 1950

108. The objectivity of the research is enhanced
(A) through its impartiality
(B) through its reliability
(C) through its validity
(D) All of the above

109. Which of the following is the basic purpose of pretest interview in this case study?

(A) To identified the potential problem

(B) To know the sample size

(C) To develop the questionnaire

(D) To use agency representative

110. Which one of the following sampling type is used in operations test to select the units?

(A) Simple random sampling

(B) Cluster sampling

(C) Quota sampling

(D) Judgment sampling

111. Which one of the following sets is the measure of central tendency?

(A) Mean, standard deviation, mode

(B) Mean, median, standard deviation

(C) Arithmetic mean, median, mode

(D) Standard deviation, internal validity, mode

112. In lab experiment the effect of Variables is controlled to evaluate the causal relationship.

(A) Extraneous

(B) Moderate

(C) Intervening

(D) All of the above

113. Internal validity refers to .

(A) Researcher's degree of confidence.

(B) Generalizability

(C) Operationalization

(D) All of the above

114. Which one of the following is not a step in nonexperimental research?

(A) Determine research problem and hypotheses

(B) Analyze data

(C) Interpret results

(D) All are steps

115. If a research finding is statistically significant, then .....

A The observed result is probably not due to chance

B The observed result cannot possibly be due to chance

C The observed result is probably a chance result

D The null hypothesis of no relationship is probably true

116. A researcher is doing a study of peer groups in middle school. She interviews 5 girls and 5 boys. She is doing a grounded theory study; hence, she decides to generate her codes as she scans through her transcriptions of her data. These codes are labeled

A A priori codes

B Post hoc codes

C Inductive codes

D Master list codes

117. Sarah is a qualitative researcher studying how children and parents interact in Head Start Centers. As she examines her data (videotapes and transcripts), she jots down notes concerning the interactions, generating hypotheses, suggesting relationships among categories of information she is examining and so on. This process of jotting notes as she examines the data is called

A Memoing

B Transcription

C Facesheet coding

D Drawing diagrams

118. Qualitative data analysis is still a relatively new and rapidly developing branch of research methodology.

A True

B False

119. The process of marking segments of data with symbols, descriptive words, or category names is known as .....

A Concurring

B Coding

C Coloring

D Segmenting

120. What is the cyclical process of collecting and analyzing data during a single research study called?

A Interim analysis

B Inter analysis

C Inter-item analysis

D Constant analysis

121. Which of the following is/are necessary condition(s) for causation?

(A) The relationship condition

(B) The temporal antecedence condition

(C) The lack of alternative explanation condition

(D) All of the above

122. Which of the following is the weakest experimental design?

(A) One group pretest-posttest design

(B) Quasi- experimental design

(C) Two group posttest only design

(D) Ex post facto design

123. The development of a solid foundation of reliable knowledge typically is built from which type of research?

(A) basic research

(B) action research

(C) evaluation research

(D) orientational research

124. Which form of reasoning is the process of drawing a specific conclusion from a set of premises?

(A) rationalism

(B) deductive reasoning

(C) inductive reasoning

(D) probabilistic

125. Research concerned with the derivation of generalizations of broad applicability and only secondarily with any practical value is called

(A) Applied research.

(B) Fundamental research.

(C) Action research.

(D) Practical research.

126. Which of the following is not relevant to analysis of the research problem?

(A) Isolating the variables that are involved in the problem and clarifying their relationships

(B) Accumulating the facts that might be related to the problem

(C) Attending seminars on research methodology

(D) Proposing various relevant explanations (hypothesis) for the cause of the difficulty.

127. Opinionnaire is defined as a special form of inquiry to collect

(A) The opinion of a sample of population on certain facts.

(B) To quantify, analyze and interpret the collected data.

(C) Both A and B

(D) Neither A nor B

128. Sociometry is a technique for describing

(A) Social relationships that exists between members of a group.

(B) Attractions or repulsions between individuals.

(C) Both A and B

(D) Neither A nor B

129. Importance of Sociometry lies in

(A) To have an idea of the group at a glance, to form appropriate groups of students for various projects and activities.

(B) To find out the changes taking place in the group structure and qualities of leadership appreciated by the group.

(C) To compare one group with the other to help the guidance worker by acquainting him with the pupil relationships.

(D) All of the above .

130. In case of true experimental research the investigator is always required to make a compromise between which of the following four is not correct?

(A) Internal validity and external validity

(B) Contrived setting and natural setting

(C) Randomization and manipulation

(D) Control of extraneous variables and building the correlated variable into design.

131. While writing a research report investigators mostly arrange items in Bibliography in

(A) Heading like – books, perdiocals, newspaper reports, public documents and miscellaneous.

(B) In a single alphabetized list.

(C) Both A and B

(D) Neither A nor B

132. When researchers refer to a significant difference, they mean that the

(A) Scores of two groups shows great variability.

(B) Experimental results have social importance.

(C) Results of a study occurred by chance.

(D) Results of a study can be replicated by another similar study.

133. Free Association in Psychoanalysis means

(A) Allowing a subject to talk freely.

(B) Focused interview.

(C) A structured interview.

(D) None of the above.

134. There is only person who has defined Educational Research. He is

(A) John W. Best.

(B) W.M. Travers.

(C) George Mouly.

(D) None of these.

135. Who said "Educational Research is that activity which is directed toward development of science of behavior in educational situation?"

(A) F.L. Whites

(B) W.S. Monroe

(C) W.M. Travers

(D) J.W. Best.

136. Which is not a characteristic of Science?

(A) Science employs hypothesis

(B) Science is based on facts

(C) Science is not free from emotional bias

(D) Science uses quantitative methods.

137. What is not the reason underlying the importance of research in education?

(A) It is a tool for verifying, testing and validating knowledge

(B) It is a potent means of creating new knowledge

(C) It has moved to the centre of the behavioral sciences

(D) It provides answers to many problems faced by educators.

138. What is not essential about a research problem?

(A) It should be amenable to research

(B) It should be significant

(C) It should lead to new knowledge

(D) It should lead to theory building.

139. In a normal distribution, 100 per cent of observations are covered by the following

(A) 3.09 s.

(B) 3 s.

(C) 2 s.

(D) s.

140. What can Statistics do?

(A) Prove anything
(B) Disprove anything
(C) Neither prove nor disprove anything-is just a tool
(D) None of these.

141. Who said, Statistics has been defined as "The Science of Counting"?
(A) Bowley
(B) Galton
(C) Stephen King
(D) R.A.Fisher.

142. On what is placed reliance in most investigations?
(A) Secondary data
(B) Primary data
(C) Both primary and secondary data
(D) None of these.

143. What is true about Secondary data?
(A) Should never be used
(B) Should be used after careful scrutiny
(C) No scrutiny is required while using it
(D) While scrutinizing, only thing to see is who collected it.

144. To which aspect are related questioning assumptions under-lying the problem?
(A) Identifying the problem
(B) Defining the problem
(C) Analyzing the problem
(D) Stating the problem.

145. What does description of the research problem NOT include?
(A) Background of the study
(B) Theories on which it is based
(C) Assumptions underlying it
(D) Review of research done.

146. Which of the following is the least helpful to locating and analyzing problems?
(A) Exploring the literature in an area of interest
(B) Discussing with the research guide
(C) Examining every day experiences
(D) Critical analysis of the existing theories and practices.

147. The correlation between two variables in which the effect of some other variable or variables on their relationship is controlled is called

(A) Contingency coefficient of correlation.

(B) Multiple correlations.

(C) Partial correlation.

(D) Product-moment correlation.

148. What is the nature of the statement that experimental generalizations are statistical inferences; they can only attain a degree of probability somewhere along a continuum between truth and falsity?

(A) Not wholly true

(B) Wholly true

(C) Incorrect entirely

(D) None of the above .

149. Which of the following is NOT an advantage of non-parametric statistical tests?

(A) They can be used when data are in the forms of ranks or categories

(B) They yield statements of exact probabilities irrespective of the shape of the population distribution

(C) They are less powerful than the parametric tests.

(D) They can be used in situations where parametric tests are applicable

150. ANOVA does NOT assume that

(A) The treatment groups are selected at random from the same population.

(B) The adjusted scores within groups have normal distribution.

(C) The treatment groups are homogeneous.

(D) The treatment groups are drawn from a larger population.

Probable answer key.

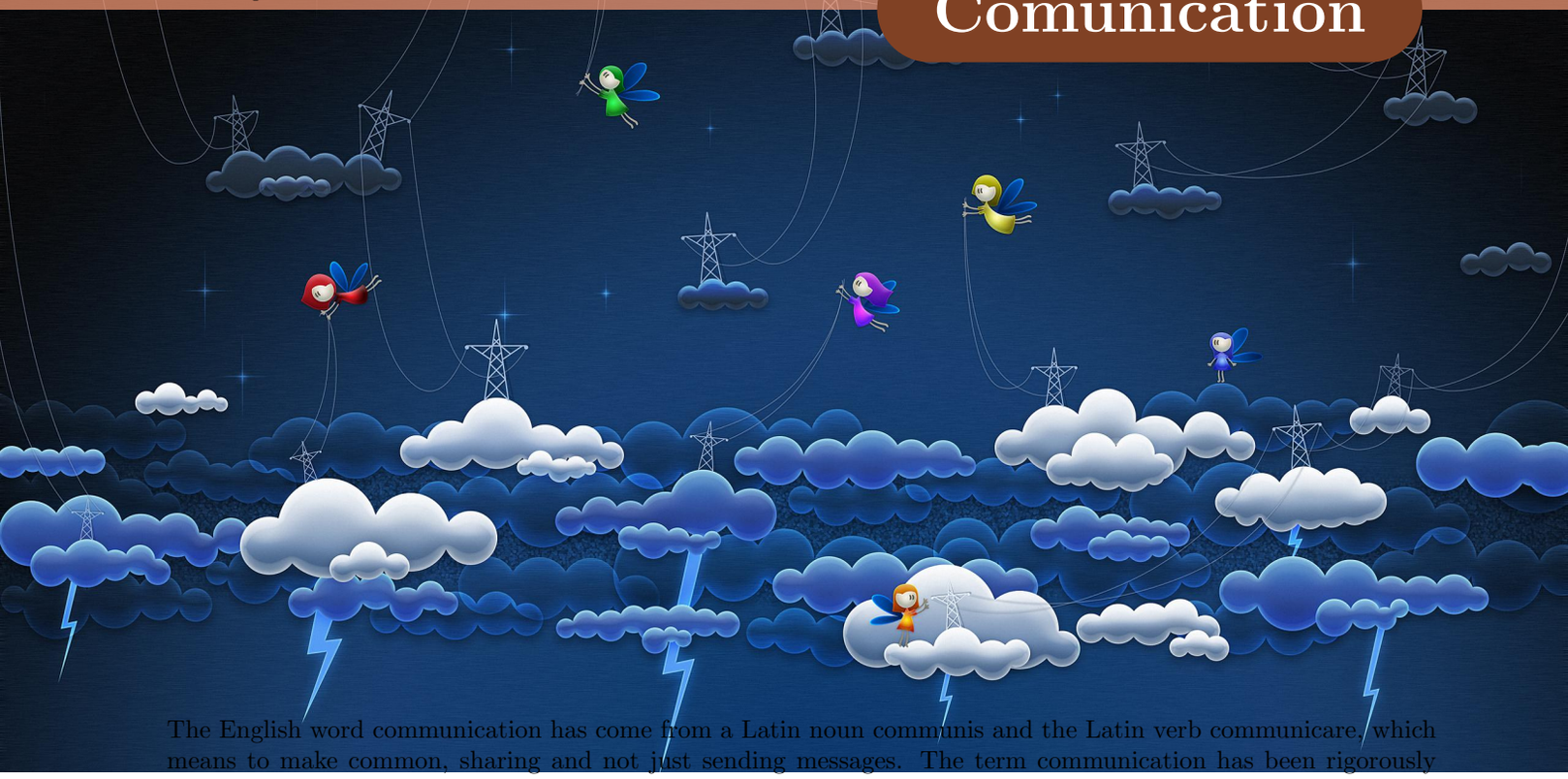
If you get any wrong answer please mail me at narayan.changder@gmail.com. I am still working on answer key. Dont only criticise, rather report right answer at above email or you can message me in facebook

Answers

1. A 2. B 3. D 4. C 5. B 6. D 7. B 8. C 9. D 10. C 11. B 12. B 13. A 14. C 15. C 16. A
17. D 18. A 19. B 20. A 21. A 22. C 23. D 24. B 25. B 26. D 27. A 28. A 29. B 30. C
31. B 32. B 33. C 34. C 35. D 36. A 37. C 38. D 39. A 40. A 41. A 42. A 43. A 44. B
45. C 46. A 47. B 48. A 50. A 51. A 52. C 53. B 54. A 55. B 56. D 57. A 58. D 59. A
60. B 61. A 62. D 63. D 64. D 65. A 66. A 67. D 68. D 69. A 70. A 71. A 72. B 73. A
74. D 75. A 76. D 77. B 78. D 80. A 81. A 82. C 83. A 84. B 85. C 86. D 87. C 88. B
89. B 90. B 91. A 92. A 93. D 94. D 95. A 96. A 97. C 98. A 99. D 100. C 101. C 102. D
103. D 104. B 105. A 106. D 107. B 108. D 109. A 110. A 111. C 112. D 113. A 114. D
115. A 116. C 117. A 118. A 119. B 120. A 121. D 122. B 123. A 124. B 125. B 126. C
127. C 128. C 129. D 130. A 131. B 132. D 133. A 134. B 135. C 136. C 137. C 138. D
139. A 140. C 141. A 142. A 143. B 144. C 145. D 146. C 147. B 148. B 149. B 150. D

Chapter 3

Comunication



The English word communication has come from a Latin noun communis and the Latin verb communicare, which means to make common, sharing and not just sending messages. The term communication has been rigorously defined by different communication expert as follows

- **Oxford dictionary:** The transfer or convening of meaning
- **Claude Shannon:** One mind effecting another
- **L.A.Richards:** It is the exchange of meaning between individuals through a common system of symbols
- **Wilbur Schramm:** The mechanism through which you mend relations exist and develop

In other words, we can simply describe, communication is the interchange of information between two or more persons. One might think that communication is only limited to the art of speaking or writing, but it is not true. Communication also covers someone's body language, personal manners and the way of their style and effect, any gesture visible to someone's eyes , or audible in someone's ear.

3.1 Definition and meaning of computation

Communication is crucial for existence of human behaviour. Some sociologist define communication as "the mechanism through which human relations exist and develop". According to the American Society of Training Directors, a good communication is "*the interchange of thought or information to bring about mutual understanding and confidence or good human relations*". Mary Ellen Guffey defines communication as "*the transmission of information and meaning from one individual or group to another*". It should be noted that communication is anything which make a message meaningful to the one being communicated with, Communication is a two-way process and is not complete without feedback. Feedback helps a communication to be an effective communication because feedback confirms receipt an adequate understanding of the intended message. Communication can be describe as a process of information transmission by three rules

- **Syntactic:** It means formal properties of sign and symbols
- **Pragmatic:** It concerned with the relations between signs/expressions and their users
- **Semantic:** It is the study of relationships between signs and symbols and what they represent.

In a simple communication model ,information or message is sent from an emisor/Sender/encoder to a destination/receiver/Decoder.

3.2 Different viewpoints of communication

Communication is important in our daily life, business and other activities. It has taken much more attention nowadays both in academic and professional field. The most important factor, however, is how communication could be used to solve organizational communication difficulties. There are various viewpoints of communication available including the 'modern', 'interpretive', 'critical', and 'post-modern'.

3.2.1 Modern viewpoint

Modern framework of communication relies on objective measurement and decision-making based on traditional calculations and progress towards an improved and more general understanding of real world phenomena. In this framework, it requires the person to follow a clear appreciation of perspective implication for the communication process to be effective.

3.2.2 Interpretive viewpoint

The interpretive perspective of communication tends to be less concerned with generalized theory, but aims at revealing the complexity and richness of communication. It has been established that interpretive perspective of communication has some linkage to the ethnographic tradition in anthropology. An application of ethnographic studies to communication, therefore, will imply that researchers must spend lengthy periods in the field of communication using qualitative research methods like observation to record conversations, stories, rituals and other activities bothering on communication especially in offices, assembly plants, and in informal relationships. In such circumstances, such information may be interpreted in the form of detailed narratives. What must be noted however is that researchers in the field of interpretive communication are barred from imposing their own interpretation since this is likely to distort the whole process of communication.

3.2.3 Critical viewpoint

The idea behind the critical perspective is linked with the ways that communication channels are used to exercise power over employees in an organization for example. Research information on methods found in the modern and interpretive perspectives are also relevant to the critical perspective of communication. The critical perspective, however, uses a more sceptical approach, and this means a certain degree of critique of the manner in which communication evolves, especially in relation to manner of use of power relating to communication in organizations.

3.2.4 Post modern viewpoint

The post modern perspective normally challenges the assumptions of the modern perspective, for example, the way and manner in which research is used in the evolution of theory of communication science. The main focus of the post modern view is that there is no neutral access to the world, as portrayed by the modernists. Communication, it is believed, may be influenced by variables such as language, globalization and contemporary trends such as the internet. The implication of this is that it is possible to make an objective, generalized or unified statement about communication.

3.3 Goals of communication

Communication is a very important tool in our daily lives. Communication happens daily at workplace or at home and so many places. There are basically four major goals achievable by communication

a) Improve recipient's level of understanding;

b) Elicit receiver's response;

c) Create good relations; and

d) Create organisational goodwill.

3.3.1 Improve recipient's level of understanding

Suppose a sender send a message, it is obvious that sender of this message knows what is the meaning of the message. But, on the other hand if receiver is unable to understand the intended meaning of the message then it is ambiguous. The expected receiver's understanding of a message is the most critical goal or objective of the communication process.

3.3.2 Elicit receiver's response

Once a message is received, the receiver will respond by one of several actions, depending on his (that is, receiver's) understanding of the message. In direct conversation, the receiver has the benefit of seeking clarification on the import of the message and the sender could also take advantage of the face-to-face interaction to explain any ambiguities in his message. In written communication, however, this is not possible and the message may thus elicit varying interpretations, based on receiver's understanding.

3.3.3 To create good relations

Another goal of communication is the creation of good relations between the parties. The sender of a message must ensure that the content of the message does not cause strains in relations. Primary responsibility for creating and maintaining good relations would be assumed by the sender and this can be done by ensuring that the wording of the message looks good, positive and encouraging. Composing messages whose contents stress the interests of the receiver is critical.

3.3.4 To create organisational goodwill

Goodwill is a critical success factor in business and communication that must be used to enhance the creation of organisational goodwill. The goodwill of all stakeholders that the organisation deals with such as clients, suppliers, customers, government, the community, etc., is necessary for the continued successful operation of business. Similarly, when individuals communicate, the receiver of the message must enjoy his or her (sender's) confidence and trust as this is likely to facilitate receiver's appreciation and response.

3.4 Process of communication

The process of communication can be viewed as six point process.

1. Conception
2. Encoding
3. Channel selection
4. Decoding
5. Interpreta
6. Feedback

The process of communication start with the idea of the message. This process may be instantaneous, that is, invention of message does not need serious reasoning.

Encoding the message

In the communication process, sender sends the message. To encode the message, sender nets to port the message into suitability form such that no one except the intended receiver understands the meaning of the message. The sender has the duty to ensure that language, vocabulary, symbols, pictures and signs used will convey the intended meaning to the receiver.

Selection of suitable channel

To send the message ,sender needs to choose the media channel. The actual transformation of the message from sender to receiver takes place inside the channel. Factors to be considered in deciding on a suitable channel include speed, cost, convenience, confidentiality, distance considerations as well as the nature and type of message.

Decoding the message

Whenever receiver receives the message from sender, the message is actually encoded message. In order to give the response to the sender, receiver needs to decode the message for effective understanding. It is totally the responsibility of the receiver to decode the message correctly.

Interpretation of the message

Decoding the message and interpretation of the message looks similar. But, decoding the message means get the original message from the encoded message. After receiver gets the original message it is the receiver responsibility to interpret the meaning of the message properly. The interpretation made by receiver may be hampered if sender the message in complex way which may be unknown by the receiver.

Feedback

After receiver gets the message and interpreted correctly, it needs to tell the sender that the message is received correctly. The way by which Sender confirms the receiver about the message delivery is called feedback. Without feedback, whole communication process is unsuccessful. Depending on the type of communication, feedback could be oral , written or involve the use of body language.

3.5 Principles of effective communication

Each and every model of any process requires some standard. Similarly the model of copy effective communication follows below principles

Choice of words

choice of words is crucial is the intention of sender is to ensure effective decoding of the message by the receiver. The sender must choose the words carefully such that receiver will understand those words. The sender needs to know the interest of recipients, attitudes and emotion level to choose the word.

Clarity of purpose

The sender should be clear, concise, and to the point and thus avoid any irrelevant matter. Once this is done, no room is left for ambiguities, which could possibly lead to the message failing to convey the intended meaning.

Listen intelligently

communication is a two way process. Listening and speaking of the two opposite process but they are like husband-and-wife. When sender speak, she must speak in way such that receiver can understand. Suppose receiver listening the message intelligently but sender speak the message ambiguously. In this case, the communication is totally an unsuccessful communication.

Selection of proper media

The method for delivery of the message could have an impact on the expected results. This impact could be favourable or unfavourable depending on the suitability of the medium in a particular circumstance. For optimum results, therefore, it is imperative that the encoded message is delivered through the most suitable medium in order that the message would elicit the right response. Choice of media should be considered in relation to distance, time, sense of urgency, and cost.

Appropriate timing of the communication

It is important to decide when to send a particular message. Depending on the nature of the message a particular time may not be suitable. In our traditional African setting, transmission of news of death of a dear one, for instance, is carefully managed and this includes finding the most suitable time to break such news. This is for the obvious reason of managing the shock or impact of such bad piece of message on the recipient.

Obtaining feedback

Obtaining feedback will ensure that the communication has been effective. As stated earlier, a message may not be understood as a result of the inadequacies of the receiver but also because the sender may not have made the right decisions in relation to what likely impression could have been created by language and expressions used, suitability of the timing of delivery, nature of tone and appropriateness of the manner of delivery.

Standards

The quality of response obtained from the communication process is as good as the standard set for all aspects of the process. High standards in choice of media, methods used both in relation to language and presentation are likely to deliver results, in so far as they are suitable for the purpose and objective of the message being communicated.

3.6 Importance of communication

Communication happens in daily life and it has lots of significance in our daily workplace or social life. Following are the points given describing importance of communication.

1. Communication happens with the individuals and in the society. Communication is the main tool for the achievement of organizational goals and objectives.
2. Communication happens between two parties where sender sends a message to the receiver and receiver interprets the message and sends the response to the receiver.
3. A good communicator has more grabbing power. Good communication always keep up the interest of the audience in the subject matter being discussed.
4. Good communication helps a person to be a good and efficient leader. Good communication skills always lead to unambiguous, clear instruction and always motivates others in the workplace.
5. Good communication always promote good relationship with others.

why communication skills are important

the main purpose of communication is to communicate with others unambiguously. To do this, both the sender and receiver are equally responsible. Message sent by sender can be misinterpreted by the receiver and in this case there is confusion. In fact, communication is successful when both the sender and receiver understand the same information as a result of communication.

3.7 Models of communication

In our dynamic life whenever we are communicating with other people we have to to test it. Model is used to test the communication. Models have been used in our daily life from engineering to the normal communication. A model is a theoretical representation of a real world situation. In the below model, Sx is the transmitter of the message and Rx is the receiver of the same message. When Rx gets the message from Sx, and respond to the message then there must be a feedback.

3.8 Barriers to effective communication

Barriers in the communication may affect the understanding of the message by receiver or even distort the messages. Barriers may arise at any stage of communication process.

1. At sender's level
2. At the encoding level
3. At the transmission level
4. At the receiver's level
5. At the feedback level

The main communication barriers are as follows

Unclear objective

If the sender of the message is not clear about the objective of the message then this situation occurs. And dignity and the lack of clarity in the message creates communication breakdown because the receiver have two unlikely to respond as expected by the sender.

Choice of wrong medium

Communication breakdown may happen in the complication process if the choice of medium is not suitable. For example, if you want to post some important letter you must go for speed post. Once an appropriate medium is chosen, the effectiveness of the commutation process and the chances of eliciting the desired response are enhanced.

Wrong timing

Timing of the communication is also crucial for the success of communication process. For example, it is better to discuss the research process whenever your mind is stable. Communication process must be chosen at a time when there is a full concentration and thereby enhancing the effectiveness of the process.

Using bad words

The choice of words has great impact in the communication process. Suppose, the sender of the message choose the words which are too technical or too difficult for the receiver to understand. In this situation, the receiver cannot decode the message easily. Words that appear too easy or too simple may also constitute a problem. It is necessary, therefore, for the sender to be able to assess the receiver in order to be able to choose the most suitable words for the message. This way, the sender ensures that the message would achieve its goals.

Meaning of words

Whereas the sender may choose words with a certain and clear meaning in mind, the words in actual fact may connote some other meaning as far as the receiver is concerned. When this happens, the sender and the receiver are at cross purpose as they both have different meanings of the message. Connotative meaning can also arise as a result of one's experiences, opinions, emotional status and interests. In order to obtain shared meaning required for words used, the sender should analyse the message being sent to be able to determine what likely connotations could arise as a result of use of certain words.

Environmental factor

The environment within which, negation takes place also have great impact on the effectiveness of communication. For example, a telephone call from a crowded place or work from busy roadways is not clearly audible.

Capability of the receiver

Physical disabilities of recipient will have an obvious effect on the extent to which the recipient appreciates the intended meaning of a message. Hearing difficulties, for instance, are obvious situations that will constitute a barrier. It is important that the sender is able to take the receiver's capability into consideration in order to ensure effective communication.

Relationships

Relationships will, no doubt, affect the effectiveness of communication.

3.9 Media of communication

In this section, we will consider the media or methods for communicating a message. There are three main methods for communication: verbal method, non-verbal method and written communication

3.9.1 Verbal communication

Verbal communication always involves use of words. It is also known as oral communication. In this type of complication the information or message is transmitted by word from mouth. Verbal, negation is always two-way process involving two or more persons. Effective verbal communication needs would good pronunciation skills, good articulation of words etc

3.9.1.1 Different forms of verbal/oral communication

We have already seen that verbal communication is also known as oral communication. We can categories verbal or oral communication into the following forms:

Interviews Interviews are always two party conversations for some specific objective. This type of communication is specially used for recruitment and selection process.

Meetings In a meeting people are gathered together for the purpose of discussion. Meeting may be arranged within the organization at any level.

Telephone communication One of the most prominent uses of verbal communication is happen in telephone conversation. In this type of communication, conversation may take place between two or more persons from different location. When appropriately used, this method of communication could be very effective as it provides immediate feedback and may be relatively less expensive.

3.10 non-verbal communication

In non-verbal communication message or information transmitted to the receiver by using body language, facial expressions, symbols and pictures. This type of communication is a perfect example of routine and non-routine communication. The various forms of diagrams, pictures, graphs and slides facilitate the effective transmission of non-verbal communication

3.10.1 different areas of non-verbal communication

There are different categories of non-verbal communication which is described below

Kinetics or body language: this involves the movement of the body and it can further be divided into the following categories

- facial expression: facial expression always comes with some meaning. A smiley face always different than an awkward face.
- Gestures: this involves pointing fingers, movement of head to show the agreement or disagreement.
- Movements: moving the finger, head or other body parts conveys non-verbal communication which may be used to send the messages to the receiver.

Proxemics: this involves physical contact like handshake. It can be further classified into the following categories Positioning: Keeping a respectful distance, looking over one's shoulder, sitting close to someone are all forms of using non-verbal cues to communicate. They transmit awareness of differing status, a close working relationship or relaxed mutual trust respectively.

- Posture: Standing straight and erect, lounging, sitting hunched up, leaning forward, spreading oneself in a chair are all means of communicating non-verbally. These convey alertness and care, self confidence (or even over confidence), nervousness or ease respectively
- Paralinguistic: Feedback sounds of surprise or agreement or annoyance or impatience, for example, uh-uh ooops!'. A heightened awareness of what people are saying non-verbally would greatly assist the manager to read a situation and to act perhaps to ward-off a personality clash or to calm an irate customer.

3.10.2 Characteristics of non-verbal communication

Following are the important characteristics of non-verbal communication

1. Non-verbal communication provides additional visual stimulus. The presence of diagrams enhances the quality of what is being communicated
2. Sometimes non-verbal communication can be unintentional. Whenever sender sends the message to the receiver, sender may be unaware that the message is non-verbal.
3. Non-verbal communication reinforces oral communication by providing non-verbal cues to emphasize what is being said orally
4. Non-verbal communication may be more honest than the verbal communication
5. Non-verbal communication is always present. Neither oral nor written communication exists without non-verbal communication

3.10.3 Advantages of Non-Verbal Communication

a) Non-verbal communication can help the communicator to overcome language barriers.

b) Non-verbal communication makes it possible for information to be conveyed to many audiences.

c) Non-verbal communication may be more reliable, at times, than verbal or oral communication because it is mostly transmitted unconsciously.

d) Non-verbal communication is always present because this form of communication is always associated with oral or written communication.

3.10.4 Disadvantages of Non-Verbal Communication

a) Non-verbal communication can, at times, be difficult to interpret without reinforcing it with written or spoken word

b) Non-verbal communication may require additional skills of comprehension and interpretation

c) Non-verbal communication does not allow time for evaluation

3.10.5 Written communication

Written communication is a form of communication in which the information to be transmitted is documented. It includes letters, memorandum, fax transmission, electronic mail, and organisational periodicals.

The following are the advantages of written communication.

a) It provides written record and evidence of receipt.

b) It is capable of transmitting complex ideas.

c) It provides analysis, evaluation and summary.

d) It disseminates information to dispersed receivers.

e) It can confirm, interpret and clarify oral communication.

f) It serves as the basis of contract or agreement.

The disadvantages of written communication include

a) It can be expensive and take time to produce.

b) Communication tends to be formal and distant.

c) There is the tendency for misinterpretation to take place.

d) There is no instant feedback.

e) It does not allow for exchange of opinions, viewer's attitudes except over a period of time.

Visual communication

visual communication refers to the transfer of information through diagrams, display boards, flip charts and other forms of visual aids. The different types of Visual Aids/Communication are as

1. The White Board
2. Objects and Models
3. Posters, Diagrams and Charts
4. Tables and Graphs
5. Strips and Slide Projectors
6. Overhead Projectors (OHP)
7. Video Tapes/Video Cassette Recorders

3.11 Patterns of communication

Communication in our society may take different patterns and various forms. The various types/ patterns of communication are Formal, Vertical, Horizontal and also Informal System.

3.11.1 Formal system of communication

The formal system of communication always communicates which passes through the official channels. In this type of communication flow of communication is always backed by some degree of authority.

3.11.2 Vertical system of communication

In any organisation vertical system of communication means principal channel for routing the policies and directives from top decision-makers down to the all levels who implement them. All the ideas, suggestions, criticism antiquaries that originates from the superior level in any organisation is called as vertical communication. Vertical communication is discriminated either downward or upward direction.

3.11.2.1 Downward communication

In downward communication, communication is always flows from superiors to the subordinates. Downward flows of communication are the most common flow of communication in any organization. Following are the forms of downward communication.

a) **Job instructions:** it is basically a direction about what to do and how to do it?

b) **Procedures and practices:** it is the information about the rules and regulations, policies and benefits in any organization.

c) **Feedback:** The manager can also provide information about how effective a subordinate is performing

3.11.2.2 Upward communication

In any organisation if the information goes from subordinates to superiors then it is known as upward communication. Upward communication is as important as the downward communication. Upward communication may take place in the following forms.

a) Information of the subordinate about himself, his performance, his problems and grievances.

b) Suggestion about what needs to be done and how it could be done.

c) Report on what has been done.

d) Information about other subordinates and their problems.

e) Feedback about the subordinate and may include some of the issues listed above. What should be noted is that managers rely on upward communication for ideas and how things can be improved

3.11.3 Horizontal system of communication

Horizontal communication is also known as lateral communication. This type of communication happens between peoples works at the same or similar level in the organisation. Horizontal communication serves five purposes

1. **Task coordination**
2. **Problem-solving**
3. **Sharing information that will enhance employee's performance**
4. **Conflict resolution**
5. **Building a rapport among the employees**

3.11.4 Informal communication system

Inside any organisation some or some of the communication is done informally even it is official. Some aspects of informal communication are discussed below.

3.11.4.1 Grapevine

One of the major form of informal communication is Grapevine communication. Grapevine communication is totally unofficial communication system which is constantly changing.

Characteristics of Grapevine communication The major characteristics of the grapevine are as follows

1. Management has absolutely no control over this form of communication.
2. It is perceived by most employees as being more believable and reliable than formal communication issued by top management.
3. It is largely used to serve the self interest of the people within it.

It has been observed that the basis for grapevine is rumours and gossips.

3.12 Barriers to organisational communication

Barriers to effective organisational communication refer to all forms of impediments that may hinder the successful flow of communication in the organisation. A number of barriers can retard or distort effective communication. Some of these barriers are discussed below.

- Language
- Selective perception
- Information overload
- Emotion
- Noise
- Filtering
- Cultural differences
- Lack of feedback

One may take following steps to reduce the barriers to effective communication.

1. Expanding the basis of communication to include feedback
2. Use proper language
3. Improving the listening skills
4. Practising empathy
5. Follow basic communication guidelines like ambiguities, proper follow-ups, timing of messages
6. Filtering
7. Cultural differences
8. Lack of feedback

3.13 Interpersonal communication

Interpersonal communication is applied to both verbal and non-verbal interaction in one-to-one or in small group. The primary elements of the persons interpersonal communications are as follows

Listening: listening is the mental activity that a person goes through whilst he awaits his/her turn to speak. The listening process consists of four elements

- Hearing
- Filtering
- Interpreting
- Recalling

Listening, as a process, can be improved if the receiver takes an active role. The following guidelines can help to improve listening skills.

- Concentrating on the message
- Keeping an open mind
- Asking question if there is doubt

- Provided regular feedback
- Monitoring and controlling personal non-verbal communication signals
- Ensuring that written or tape-recorded notes are made clearly and in sufficient details for future reference and follow-up work

Speaking/oral communication : One of the main part of oral communication is speaking, by this we can convey messages. In order to create a well-structured oral message, the speaker should do following

1. First decide on the context of the oral communication and what outcomes are desired.
2. Establish the key points to get across and what running order would best link them together in a beginning, middle and an end.
3. Advance the salient facts and figures which will support the argument.
4. Decide on what the delivery style of the message should be before embarking it.
5. The speaker should constantly monitor the feedback he receives from his audience
6. The speaker should know when he has said enough () and (then) stop on a positive note.

3.14 The 7 C's of communication

There are 7 C's of effective communication which are applicable to both written as well as oral communication. These are as follows:

Completeness : The communication must be complete. It should convey all facts required by the audience. The sender of the message must take into consideration the receiver's mind set and convey the message accordingly. A complete communication has following features:

a) Complete communication develops and enhances reputation of an organization.

b) Moreover, they are cost saving as no crucial information is missing and no additional cost is incurred in conveying extra message if the communication is complete.

c) A complete communication always gives additional information wherever required. It leaves no questions in the mind of receiver.

d) Complete communication helps in better decision-making by the audience/readers/receivers of message as they get all desired and crucial information.

e) It persuades the audience.

Conciseness: Conciseness means wordiness, i.e, communicating what you want to convey in least possible words without forgoing the other C's of communication. Conciseness is a necessity for effective communication. Concise communication has following features:

a) It is both time-saving as well as cost-saving.

b) It underlines and highlights the main message as it avoids using excessive and needless words.

c) Concise communication provides short and essential message in limited words to the audience.

d) Concise message is more appealing and comprehensible to the audience.

e) Concise message is non-repetitive in nature.

Consideration : Consideration implies "stepping into the shoes of others". Effective communication must take the audience into consideration, i.e, the audience's view points, background, mind-set, education level, etc. Make an attempt to envisage your audience, their requirements, emotions as well as problems. Ensure that the self-respect of the audience is maintained and their emotions are not at harm. Modify your words in message to suit the audience's needs while making your message complete. Features of considerate communication are as follows:

a) Emphasize on "you" approach.

b) Empathize with the audience and exhibit interest in the audience. This will stimulate a positive reaction from the audience.

c) Show optimism towards your audience. Emphasize on "what is possible" rather than "what is impossible". Lay stress on positive words such as jovial, committed, thanks, warm, healthy, help, etc.

Clarity : Clarity implies emphasizing on a specific message or goal at a time, rather than trying to achieve too much at once. Clarity in communication has following features:

a) It makes understanding easier.

b) Complete clarity of thoughts and ideas enhances the meaning of message.

c) Clear message makes use of exact, appropriate and concrete words.

Concreteness : Concrete communication implies being particular and clear rather than fuzzy and general. Concreteness strengthens the confidence. Concrete message has following features:

a) It is supported with specific facts and figures.

b) It makes use of words that are clear and that build the reputation.

c) Concrete messages are not misinterpreted.

Courtesy: Courtesy in message implies the message should show the sender's expression as well as should respect the receiver. The sender of the message should be sincerely polite, judicious, reflective and enthusiastic. Courteous message has following features:

a) Courtesy implies taking into consideration both viewpoints as well as feelings of the receiver of the message.

b) Courteous message is positive and focused at the audience.

c) It makes use of terms showing respect for the receiver of message.

d) It is not at all biased.

Correctness : Correctness in communication implies that there are no grammatical errors in communication. Correct communication has following features:

a) The message is exact, correct and well-timed.

b) If the communication is correct, it boosts up the confidence level.

c) Correct message has greater impact on the audience/readers.

d) It checks for the precision and accurateness of facts and figures used in the message.

e) It makes use of appropriate and correct language in the message.

Awareness of these 7 C's of communication makes you an effective communicator.

3.15 Barriers to communication

3.16 Features of communication

1. If a person replied like “I see” or “mm-hmm” then it is known as
   - (A) Positive feed back
   - (B) Negative feed back
   - (C) Ambiguous feed back
   - (D) Nonverbal feedback

2. Which of the following methods of communication is the most effective?
   - (A) Presenting written material
   - (B) Nonverbal Communication
   - (C) Multi-media method
   - (D) Oral Communication

3. Teaching on TV is superior to class room instruction because
   - (A) Very large classes are made possible and thus it is economically advantageous
   - (B) Experts for teaching difficult topics can be arranged
   - (C) Teaching can be filmed for reuse
   - (D) All of these

4. The most basic function of communication is to
   - (A) Inform people
   - (B) Instruct people
   - (C) Influence people
   - (D) All of these

5. Encoding is
   - (A) The formulation of messages in the communicator’s mind
   - (B) The formulation messages in the receiver’s mind
   - (C) Coding of whole communication process
   - (D) None of these

6. The two major types of essay are
   - (A) Simple and long
   - (B) Simple and complex
   - (C) Simple and direct
   - (D) Direct and long

7. In writing an essay, ideas may NOT be generated in the mind through
   - A Decomposition
   - B Compounding
   - C Association
   - D Cooperation

8. ONE of the following is NOT a characteristic of oral presentations.
   - A Appropriateness
   - B Clarity
   - C Clumsiness
   - D Adequacy

9. Which of the following newspaper oldest and still existing?
   - A Times of India
   - B The Hindu
   - C Mumbai Samachar
   - D None of them existing now

10. Mumbai Samachar is a magazine in language
    - A Hindi
    - B Urdu
    - C Gujarati
    - D Marathi

11. Which of the following is oldest magazine published from Kolkata since 1944?
    - A The Calcutta review
    - B Bartaman patrika
    - C Dainik jagran
    - D The Calcutta news

12. Which of the following is the largest single edition regional newspaper?
    - A Anandabazar patrika
    - B janasatta
    - C Nai Dunia
    - D None of the above

13. The oldest existing English daily of India is

A The Times of India

B The Hindustan Times

C The Hindu

D The Telegraph

14. Channels used for downward communication are

A Types of print

B Oral media

C Handbook manuals

D All of the above

15. What is the other name of Hicky's Bengal Gazette?

A The Bengal News

B Calcutta General advertiser

C Bengal Journal

D None of them

16. Which communication has an emotional appeal?

A Intrapersonal communication

B Interpersonal communication

C Mass communication

D Group communication

17. A fatwa was issued in Salman Rushdie's name following the publication of

A Midnight's children

B Shame

C Satanic Verses

D none of the above

18. The teacher has arranged a meeting with Sakshi's mother to discuss these concerns. Which of the following statements is best for the teacher to say to Sakshi's mother?

A Sakshi needs extra practice reading and writing problematic letters and words at home at least 30 minutes per day.

B Please discuss the importance of schoolwork to Sakshi so that she will increase her efforts in classwork.

C These are possible symptoms of dyslexia so I would like to refer her to a specialist for diagnosis.

D Please adjust Sakshi's diet because she is most likely showing symptoms of ADHD due to food allergies.

19. In which language the highest newspapers are published in India

(A) English
(B) Hindi
(C) Bengali
(D) Gujarati

20. Which of the following is best suited with the Reader's Digest?
(A) It is monthly periodical
(B) It is a newspaper
(C) It is quarterly periodical
(D) None of the above

21. The first objective of teaching English is to develop
(A) Listening skill
(B) speaking skill
(C) Reading skill
(D) writing skill

22. The numbers of kings of sounds are
(A) 2
(B) 3
(C) 4
(D) 5

23. Which of the following is used to facilitate oral presentation?
(A) Aid
(B) Aids
(C) Visual Aids
(D) Manual Aids

24. Which ONE of the following is a basic type of speech?
(A) Poetry
(B) Written
(C) Public
(D) Precise

25. A speech-writer earns a good living by writing speeches is
(A) Professional
(B) Personal

C Elementary

D Semi-literate

26. When using remote communication it is best to

A Use concise, accurate and clear statements.

B Use unexplained jargon.

C Use spoken expression and construction.

D Avoid checking spelling and grammar.

27. The kinds of sounds are

A Consonant sounds, oral sounds

B Oral sounds, vowel sound

C Verbal sounds, consonant sounds

D Consonant sounds, Vowel sounds

28. Phonemins the unit of sound

A Maximum

B Minimum

C Medium

D Large

29. The number of branches of phonetics are

A 2

B 3

C 4

D 5

30. Which of the following is matched with press trust of India

A It is an News agency

B It is an newspaper

C It is a trust for poor

D None of the above

31. In which year modern postal service started in India?

A 1837

B 1839

C 1848

D 1948

32. Who said that communication is the interchange of thoughts and ideas

(A) McLuhan
(B) Dennis McQuail
(C) Charles E. Osgood
(D) Lord Mountbatten

33. ONE of the following groups is the components of The Rhetorical Triangle.
(A) Appeal and logic
(B) Appeal, emotion and logic
(C) Appeal, resolution and logic
(D) Resolution, logic and emotion

34. In an organization, the two basic types of correspondence are
(A) External and international
(B) International and regional
(C) Internal and external
(D) Internal and regional

35. ONE of the following is NOT a characteristic of internal correspondence.
(A) May not be disclosed to outsiders
(B) Sometimes restrictive
(C) Sometimes secretive
(D) May be disclosed to outsiders

36. Internal correspondence may be either secret or
(A) Closed
(B) Open
(C) National
(D) Departmental

37. At the end of 19th century who introduced motion pictures?
(A) Lumiere Brothers
(B) Guttenberg
(C) Thomas Kuhn
(D) Donald Knuth

38. Non-verbal communication is
(A) Kinesics
(B) Proxemics
(C) Para language
(D) All of the above

39. Interpersonal communication is

    A Person to person contact

    B When an individual sends and receives messages

    C The thought process

    D Communication with mass audience

40. When using remote communication it is advisable to avoid

    A Formal language.

    B Abrupt and impolite messages.

    C Correcting spelling and grammar.

    D Using one idea to a sentence.

41. Phonology is the study of how sounds are

    A Produced

    B Transmitted

    C Organized

    D Distinguished

42. Which of the following incidents happened in year 1854?

    A IU postal system was introduced

    B Post office savings bank started

    C The first postage stamp introduced

    D All of them happened in the same year

43. Which of the following is the full form of UNI

    A United Nations information

    B United Nations India

    C United News Indian

    D None of the above

44. The highest level in linguistics is

    A Phonology

    B phonetics

    C Morphology

    D Pragmatics

45. DNA is a joint venture of

(A) Zee TV and Star TV

(B) Zee TV and Dainik Jagran

(C) Zee TV and Dainik Bhaskar

(D) Zee TV and Doordarshan

46. Who among the following is a celebrated cartoonist

(A) Abu Abraham

(B) Ajay Jadeja

(C) Morris Odumbe

(D) Sanath Jayasurya

47. The official secrets act came into effect in

(A) 1910

(B) 1923

(C) 1945

(D) 1947

48. The Right to information act came into effect in

(A) 2006

(B) 2004

(C) 2005

(D) 1999

49. The numbers of vowels in English are

(A) 21

(B) 3

(C) 4

(D) 5

50. The number of consonants in English are

(A) 15

(B) 21

(C) 26

(D) 31

51. What is an external correspondence issued to the mass media on a specific issue, which is meant for public consumption called?

(A) House Release

(B) Press Release

(C) Press Note

(D) House Report

52. Which of the following is NOT a feature of an official letter?

(A) Written on the letter head

(B) Contains personal feelings

(C) Carries a reference number

(D) contains address and telephone number(s)

53. ONE of the following is NOT a feature of a special meeting.

(A) Handling of routine matters

(B) No consideration of minutes of any previous meeting

(C) Notice of meeting

(D) Called to consider a specific issue or issues

54. The convession of spoken words into written language is

(A) Transplantation

(B) Transmission

(C) Transcription

(D) Translation

55. Remote communication takes many forms and has various characteristics. It includes

(A) Telephones and the internet.

(B) Written reports and databases.

(C) Video/teleconferences.

(D) All of the above.

56. Which of the following is the full form of PIN (related to PIN code)

(A) Postal index number

(B) Postal identity number

(C) Both A and B

(D) None of the above

57. In which year air mail system started

(A) 1854

(B) 1853

(C) 1829

(D) 1975

58. In 1881-82, the first telephone service was started in

(A) Kolkata

(B) Mumbai

(C) Delhi

(D) Howrah

59. Effective communication requires

(A) Connection, an uncommon purpose and mutual understanding

(B) Receiving and understanding

(C) Understanding of different environmental factors

(D) None of the above

60. The Indian equivalent of communication is

(A) Antology bhab

(B) Sadaharanikaran

(C) Anubhav

(D) All of the above

61. Intrapersonal communication is best described as

(A) Complication between person to person

(B) Talking to oneself

(C) More than two persons are talking

(D) All of the above

62. Which is the father of Indian language journalism in India

(A) Raja Rammohan Roy

(B) Swami Vivekananda

(C) Sister Nivedita

(D) Netaji Subhash Chandra Bose

63. Who among the following wrote the book television in India

(A) Vinod Mehta

(B) Nalin Mehta

(C) Milkha singh

(D) Amitava Bachhan

64. Which of the following newspaper is published in a tabloid form

(A) Mail today
(B) The statement
(C) The Telegraph
(D) The Tribune

65. Grapevine is related to
(A) Horizontal communication
(B) Vertical communication
(C) Oral communication
(D) Informal communication

66. Misunderstandings
(A) Can be easily avoided if you supply written information.
(B) Only occur when you have not clearly explained something.
(C) Can be avoided if you adjust your language appropriately and allow time for questioning and clarifying.
(D) Are breakdowns in communication

67. Which of the following is NOT a feature of a regular meeting?
(A) Notice of meeting
(B) Consideration of minutes of a previous meeting
(C) Motion for adjournment
(D) Call to the bar

68. Which of the following is the purpose for convening an emergency meeting?
(A) There is a ceremony to be performed
(B) There is a member of staff to be sent off
(C) There is an urgent matter at hand
(D) There is money to be shared

69. Channel for upward communication is
(A) Newspapers
(B) Letters sent to home
(C) Posters
(D) Offer options that allow anonymous input, such as suggestion boxes etc

70. When was censorship introduced on Indian press
(A) 1970
(B) 1790
(C) 1792
(D) 1795

71. When was commercial broadcasting started in Akashvani?
    - A November 1, 1967
    - B November 1, 1957
    - C November 1, 1935
    - D November 1, 1945

72. In India, the first automatic telephone exchange was commissioned at
    - A Calcutta
    - B Delhi
    - C Shimla
    - D None of the above

73. Which of the following is full form of NSD with respect to communication technology
    - A National subscriber dialling
    - B National School of defence technology
    - C National system of dialling technology
    - D none of the above

74. In which year VSNL was formed
    - A 1986
    - B 1983
    - C 1922
    - D 1935

75. When was the national channel started up broadcast quality music.
    - A 18 May, 1988
    - B 18 May, 1936
    - C 18 May, 1947
    - D 18 May, 1992

76. Which of the following happened in 1976
    - A Doordarshan was separated from AIR
    - B Doordarshan was separated from FM
    - C Colour television was introduced in India
    - D None of the above

77. Which of the following is true about Prasar Bharti?

(A) It is a television channel

(B) It is newspaper

(C) It is magazine

(D) It is autonomous broadcasting Corporation

78. The first newspaper in India started in

(A) Kolkata

(B) Assam

(C) Bangladesh

(D) Chattagram

79. ONE of the following is NOT a purpose for which a notice of meeting is sent to members of a meeting.

(A) Invite participants to an event

(B) Inform participants prior to the take-off of an event

(C) Inform participants after the take-off of an event

(D) Give ample time for participants to plan to attend an event

80. Which of the following states the three fundamental tools of a meeting?

(A) Notice of Meeting, Chairman's Opening Remarks and Agenda

(B) Notice of Meeting, Agenda and Minutes of Meeting

(C) Agenda, Chairma's Opening Remarks and Chairman's Closing Remarks

(D) Notice of Meeting, Chairman'S Closing Remarks and Agenda

81. Match the following

A	Sounds	1	Facial expressions
B	Writing of a letter	2	Formal communication
C	Mannerism	3	Speech rate
D	Office meeting	4	Written communication

(A) $A-2, B-3, C-1, D-4$

(B) $A-3, B-2, C-1, D-4$

(C) $A-4, B-3, C-1, D-2$

(D) $A-3, B-2, C-4, D-1$

82. In Internet technology ISP means

(A) Internet service provider

(B) Internet subscriber Porter

(C) Internet subscriber provider

(D) Internet system provider

83. Which of the following is the largest Internet service provider in India

A VSNL

B BSNL

C NTML

D Airtel

84. Where from the term cummunis came from

A Latin

B Greek

C Roman

D Persia

85. Which of the following is nature of communication

A Process of exchange of ideas

B A purposive process

C A psychosocial process

D All of the above

86. Match the following

A	Ratan tata	1	We the people
B	Arun Shorie	2	Editor of Indian Express
C	Barkha Dutt	3	grapevine
D	Keith davis	4	Industrialist

A $A-2, B-3, C-1, D-4$

B $A-4, B-2, C-1, D-3$

C $A-4, B-3, C-1, D-2$

D $A-3, B-2, C-4, D-1$

87. Cultural safety

A Protects the culture of the health professional, keeping it safe.

B Requires special places of safety that accommodate the relevant culture.

C Requires understanding of your own culture, the culture of the health service and the culture of the person seeking assistance.

D All of the above.

88. Match the following

A	Pictures	1	High order skills
B	High skills	2	Visual communication
C	Hums	3	Speech art
D	Long distances	4	Public telephone network

(A) $A-2, B-3, C-1, D-4$

(B) $A-2, B-1, C-3, D-4$

(C) $A-4, B-3, C-1, D-2$

(D) $A-3, B-2, C-4, D-1$

89. Match the following

A	Teleconferencing	1	First para of news
B	Angle	2	A website where you can add, remove or edit the content
C	Lead	3	group of persons
D	Wikipedia	4	Focus of the story

(A) $A-2, B-3, C-1, D-4$

(B) $A-3, B-4, C-1, D-2$

(C) $A-4, B-3, C-1, D-2$

(D) $A-3, B-2, C-4, D-1$

90. Generally in a communication the position of perception, retention and recall will be

(A) Like Channel variables

(B) Like dependent variable

(C) Like destination variable

(D) None of the above

91. Which of the following is the responsibility of a messenger?

(A) To encode the message

(B) To decline the message

(C) To develop the message

(D) All of the above

92. In the question below the two statements labelled as assertion (A) and reason (R) . Which one of the following is correct

Assertion (A) : downward communication flows from superior to downward

Reason(R) : downward communication helps in resolving conflicts

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true, R is not the correct explanation of A

(C) A is true, R is false

(D) A is false, R is false

93. Which of the following is responsible for decoding the message?

A Sender
B Receiver
C Channel
D Adapter

94. Which of the following is known as the biggest barrier of communication?
A Noise
B Bad words
C Channel distortion
D None of the above

95. At present network, Akashvani comprises of how many broadcasting centres
A 197
B 132
C 120
D 95

96. Communication with indigenous peoples
A Is no diff erent to communication with non-indigenous peoples.
B Is inevitable when practising as a health professional.
C Requires the health professional to stereotype each indigenous person they see.
D Requires understanding of the complexity and diversity of cultural identity to create cultural safety

97. Which of the following is NOT a type of technical report?
A Research Report
B Committee Report
C Spectator's Report of a football match
D Investigative Report of Communal riot

98. ONE of the following is NOT a part of a technical report.
A Title Page
B Table of Contents
C Acknowledgement
D Invitation

99. The reference section of a report does NOT have ONE of the following features.
A Author's names are arranged alphabetically
B Titles of cited works are indicated in full
C Year of publication for each entry is indicated
D Acknowledgement

100. Which of the following is NOT included in the appendix section of a report?

(A) Conclusion

(B) Maps

(C) Questionnaire

(D) Graphs

101. How many relay centres does Akashvani have

(A) 10

(B) 12

(C) 14

(D) 15

102. Communication by using the Eyes is an example of

(A) Non-verbal communication

(B) Written communication

(C) Verbal communication

(D) None of the above

103. Which of the following is responsible to change the messages into symbols?

(A) Decoding

(B) Encoding

(C) Symbolic expression

(D) All of the above

104. When did the radio broadcasting started in India

(A) 1927

(B) 1925

(C) 1936

(D) 1920

105. Which of the following places two privately owned transmitters placed when AIR started in India?

(A) Mumbai and Kolkata

(B) Mumbai and pune

(C) Kolkata and Pune

(D) Kolkata and Assam

106. When did Vividh Bharati started?

(A) 1957

(B) 1955

(C) 1947

(D) 1920

107. In which year FM became private organization?

(A) July 6, 1999

(B) July 6, 1997

(C) July 6, 1995

(D) July 6, 1993

108. In the question below the two statements labelled as assertion (A) and reason (R) . Which one of the following is correct.

Assertion (A):two way communication is not possible in the mass media
Reason (R):the message is conveyed, but the feedback is not immediate

(A) Both A and R are true, R is the correct explanation of A

(B) Both A and R are true, R is not the correct explanation of A

(C) A is true, R is false

(D) A is false, R is false

109. Which of the following is known as important element of communication?

(A) The sender and the receiver

(B) The sender and the chairman

(C) The receiver and the channel

(D) The sender, Channel and receiver

110. For a teacher to be an effective communicator it is essential that

(A) Teacher must start from the point from where the children are ready to learn

(B) Teacher must use good teaching aid

(C) The teacher must be a master in that subject

(D) All of the above

111. A teacher should behave with the children

(A) Intellectually

(B) Democratically

(C) Autocratically

(D) Morally

112. In the question below the two statements labelled as assertion (A) and reason (R) . Which one of the following is correct.

Assertion (A):a newspaper is a mass media tool
Reason (R):newspaper connects masses with pieces of information

A Both A and R are true, R is the correct explanation of A
B Both A and R are true, R is not the correct explanation of A
C A is true, R is false
D A is false, R is false

113. Interpretation is beneficial when communicating across cultures. There are different kinds of interpretation, which include

A Simultaneous.
B Transliteration.
C Sequential.
D All of the listed items.

114. In the question below the two statements labelled as assertion (A) and reason (R) . Which one of the following is correct.

Assertion (A):non-verbal communication is related to expression of feelings, emotions in a wordless manner
Reason (R):body language is helpful in creating an understanding of any matter of feelings

A Both A and R are true, R is the correct explanation of A
B Both A and R are true, R is not the correct explanation of A
C A is true, R is false
D A is false, R is false

115. Suppose you are unable to follow a foreigners language. In this case, communication of messages will be carried out through

A Symbolic language
B Body language
C Screaming
D None of the above

116. Message is passing through the

A Transmission wire
B Channel
C Transmission medium
D None of the above

117. Which of the following is the meaning of communication according to Hegons

A Dialogue between two-persons

B Interaction among two groups

C Both A and B

D None of the above

118. The general appeal of a report is NOT dependent on ONE of the following.

A Language choice

B Language use

C Format

D Launching ceremony

119. Marketing communication in an organization is NOT directed at ONE of the following.

A Middlemen

B Consumers

C Salesmen

D Management

120. Which of the following is NOT a method of establishing and sustaining marketing relations?

A Press Release

B Advertorial

C Feature article

D Force

121. Identify the correct sequence of newspaper format

A Mast-head, headline, conclusion, body

B Body, conclusion, headline, mast-head

C Conclusion, headline, body, mast-head

D Mast-head, headline, body, conclusion

122. Identify the correct sequence of news channels

A Zee news, colors, Star plus, Al Jazeera

B Zee news, ABP news, Al Jazeera, Times

C CNBC,BBC,Star world, Sony

D All of the above

123. Which of the following is not true about the types of oral communication?

A) Auditory communication is dependent on hearing

B) Idiolect is a language of an individual at a particular period in life

C) monologue is a long utterance by many people simultaneously

(A) Only A

(B) Only B

(C) Only C

(D) all of the above

124. Which of the following is not a true statement about an oral communication?

I) Oral communication provides an immediate feedback

II) Oral communication is more authentic than written communication

III) Oral communication is not frequently used in legal records

(A) Both I and II

(B) Both I and III

(C) Both II and III

(D) None of the above

125. Which of the following is the barrier of communication?

(A) Language barrier

(B) Physical barrier

(C) Psychological barrier

(D) All of the above

126. In effective communication a long statement is considered as

(A) Barrier

(B) Not a barrier to

(C) Effective message

(D) Wrong message

127. Which of the following train disseminates scientific awareness in the country?

(A) Technological rail

(B) Scientific rail

(C) Science and technology rail

(D) All of the above

128. Culturally appropriate communication is essential for eff ective communication.

(A) It requires the health professional to live in the country and speak the language.

(B) It is impossible for a health professional to be culturally competent so being friendly and helpful will compensate.

(C) If the health professional uses an interpreter they will achieve culturally appropriate communication.

(D) It requires awareness of cultural diff erences, sensitivity and openness to these differences, and acknowledgement of the validity of the other culture.

129. To communicate easily and effectively with your readers, how many number of principles communication are applied

A Nine

B Seven

C Eleven

D Six

130. A letter that completes a valid contract between a buyer and a seller is called.

A An order letter

B An acknowledgment letter

C An inquiry

D A sales letter

131. Who enforced the vernacular press act?

A Raymond Williams

B Marshall Lyton

C Queen Victoria

D Lord Clive

132. Who among the following differentiated between Hot and Cold messages?

A Raymond Williams

B Marshall Mcluhan

C James Augustus

D None of the above

133. Which of the following is NOT an effective advertising media?

A Bill boards

B Television

C Whisper

D Internet

134. ONE of the following is NOT an example of an electronic media.

A The internet

B Newspapers

C Television

D Cable network

135. Which of the following is NOT an example of the print media?

(A) Television
(B) National Dailies
(C) Metropolitan Dailies
(D) Magazines

136. Which of the following is an important property for an effective communicator?
(A) The objective of communication
(B) Thinking about the evaluation procedure
(C) Both A and B
(D) None of the above

137. The ultimate objective of feedback in the process of communication is a
(A) To bring some desirable changes in the process of communication
(B) To understand about the messages
(C) To understand the disadvantage of communication
(D) All of the above

138. In discussion with small group, the students can interact with each other in
(A) Restricted environment
(B) A more liberal environment
(C) A fully restricted environment
(D) None of the above

139. Which committee was set up to re-examine the Prasar Bharti Act?
(A) Sengupta committee
(B) Changder committee
(C) Ghosh committee
(D) Pradhan committee

140. A combination of document analysis, observations and interviews are applied usefully in
(A) Content analysis
(B) Case study
(C) Survey research
(D) Field experiment

141. Which was the first Indian advertising agency?
(A) Indian advertising agency
(B) Indian national advertising agency
(C) national advertising agency
(D) international advertising agency

142. Which of the following is the popular editing software for film/video?

A Photoshop

B Indesign

C Final cut pro

D VCD cutter

143. Which of the following is the most important step for an effective communicator?

A Determining objectives of communication

B Identifying mediums of communication

C Selecting the most suitable channel

D All of the above

144. Culture includes

A Values and beliefs.

B Customs, traditions, values and desires.

C Ways of living and behavioural habits.

D Beliefs, values, spirituality, language, familial and social roles, artistic expression, food, non-verbal behaviour and remedies.

145. Family/person-centred practice is

A Supported by all health professions.

B A new concept that developed at the beginning of this century.

C Only useful when working with children.

D The use of a collaborative relationship to fulfil the needs and achieve the goals of the person seeking assistance.

E The practice of mainstream medical health professions only.

146. Respect is essential when practising as a health professional.

A However, you only need to respect yourself and your colleagues.

B It is the foundational factor that builds mutual understanding and a therapeutic relationship.

C It is especially important when relating to people older than you.

D However, you only need to respect those people who respect you.

147. The interpretation of physical message into a form that has eventual meaning for a receiver is called

A Coding

B Recording

C Decoding

D Encoding

148. Which of the following is the first newspaper to have a reader's editor?

(A) The Times of India

(B) The Hindu

(C) Hindustan Times

(D) the pioneer

149. In communication, ... confirms receipt of the message.

(A) Receiver

(B) Communication

(C) Channel

(D) Sender

150. Communication is a ..... way process.

(A) Two

(B) Three

(C) One

(D) None of above

151. Which is India's first channel on children on TV?

(A) Cartoon network

(B) Walt Disney

(C) United home entertainments Hungama TV

(D) Nick Junior

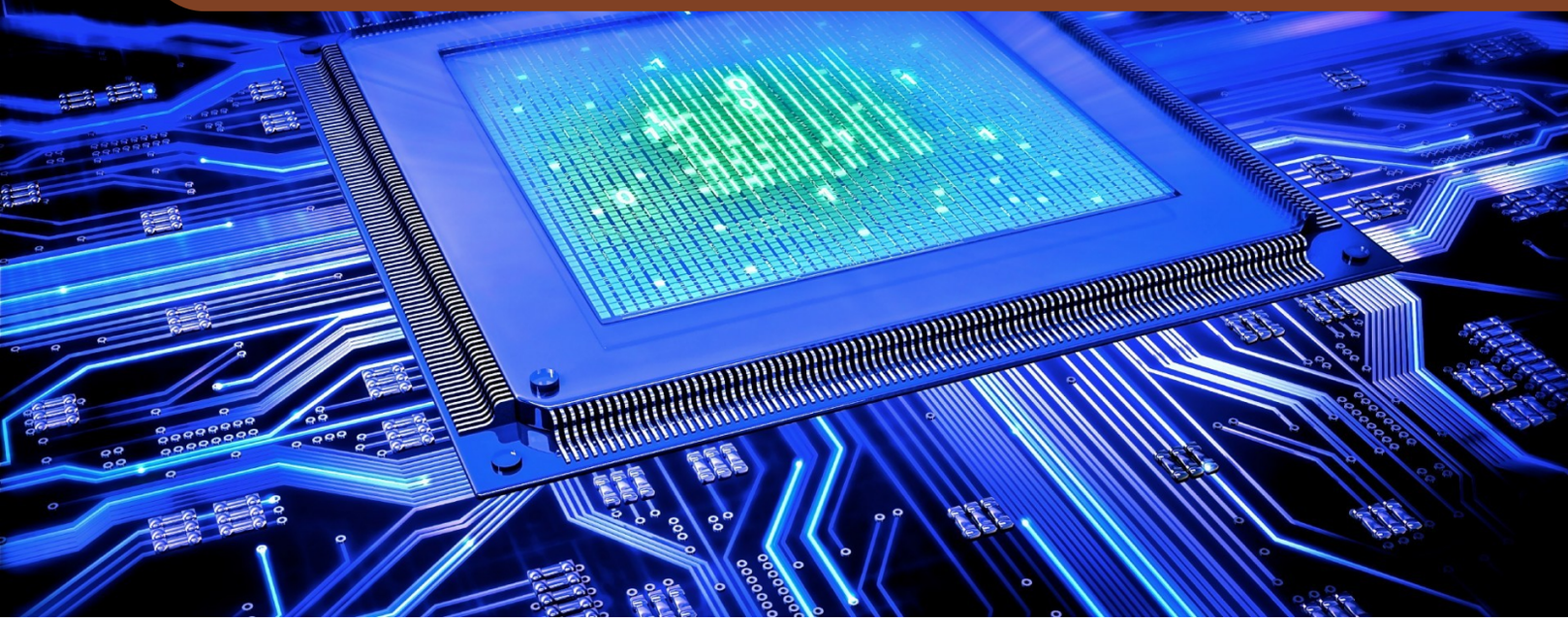
Probable answer key.

If you get any wrong answer please mail me at narayan.changder@gmail.com. I am still working on answer key. Dont only criticise, rather report right answer at above email or you can message me in facebook

Answers

1. C 2. C 3. D 4. D 5. A 6. A 7. D 8. C 9. C 10. C 11. A 12. A 13. A 14. D 15. B 16. B
17. C 18. C 19. B 20. A 21. A 22. A 23. C 24. C 25. A 26. A 27. D 28. B 29. B 30. A
31. A 32. B 33. B 34. C 35. D 36. B 37. A 38. D 39. A 40. B 41. C 42. C 43. A 44. B
45. C 46. A 47. B 48. C 49. D 50. B 51. B 52. B 53. A 54. C 55. D 56. A 57. A 58. A
59. B 60. B 61. B 62. A 63. B 64. A 65. D 66. C 67. D 68. C 69. D 70. D 71. A 72. C
73. A 74. A 75. A 76. A 77. D 78. A 79. C 80. B 81. B 82. A 83. A 84. A 85. D 86. B
87. C 88. B 89. B 90. A 91. D 92. B 93. B 94. A 95. A 96. D 97. C 98. D 99. D 100. A
101. A 102. A 103. B 104. A 105. A 106. A 107. B 108. A 109. D 110. A 111. B 112. A
113. D 114. C 115. A 116. B 117. C 118. D 119. D 120. D 121. D 122. B 123. C 124. B
125. D 126. A 127. C 128. D 129. B 130. B 131. B 132. B 133. C 134. B 135. A 136. C
137. A 138. B 139. A 140. D 141. A 142. C 143. A 144. D 145. D 146. B 147. C 148. B
149. A 150. A 151. C

Information and Communication technology



In this chapter we will learn about the computer and its different viewpoint. So what is a computer system?. In principle, any system is contained within a boundary, either logical or physical. The system interacts with the environment where the environment lies outside the boundary. A computer system interacts with its environment via inputs and outputs. Mind it, the computer system has no direct control over the environment it can only control what is happening inside the boundary. The system receives inputs, but it has no control over what these inputs are. At the end it gives output.

Systems can be defined in many ways. They could have the same boundary, but a different way of looking at it. It could also have a different boundary.

Computer Systems

You could look at a computer system in the following ways:

1. A tool that takes commands and returns data.
2. A collection of components that take in electrical signals and returns electrical signals.
3. A device for converting characters to binary code.
4. A component in an office workflow diagram.

4.1 Computer systems

Computer Systems

Computer is an advanced electronic device that takes raw data as input from the user and processes these data under the control of set of instructions (called program) and gives the result (output) and saves output for the future use. It can process both numerical and non-numerical (arithmetic and logical) calculations.

A computer has four functions:

1. **Input(Data)** Computer input is whatever is entered or fed into a computer system. Input can be supplied by a person (such as by using a keyboard) or by another computer or device (such as a diskette or CD-ROM). Some examples of input include the words and symbols in a document, numbers for a calculation, instructions for completing a process, pictures, and so on.

2. **Processing** Process is the manipulating the data in many ways.This manipulation is called processing. Examples of processing include performing calculations, sorting lists of words or numbers, modifying documents and pictures according to user instructions, and drawing graphs. A computer processes data in the CPU.

What is a process

Process is A systematic series of actions a computer uses to manipulate data.

3. **Output:** Output is the processed data given by computer after data processing. Output is also called as Result. We can save these results in the storage devices for the future use.

4. **Store result:** A computer must store data so that it is available for processing. Most computers have more than one location for storing data (the hard drive or C:\and the floppy drive or A:\). The place where the computer stores the data depends on how the data is being used. The computer puts the data in one place while it is waiting to be processed and another place when it is not needed for immediate processing. The storage of data in the computer is called online storage while the storage of data on computer tapes, diskettes or CD-ROMs is called offline storage.

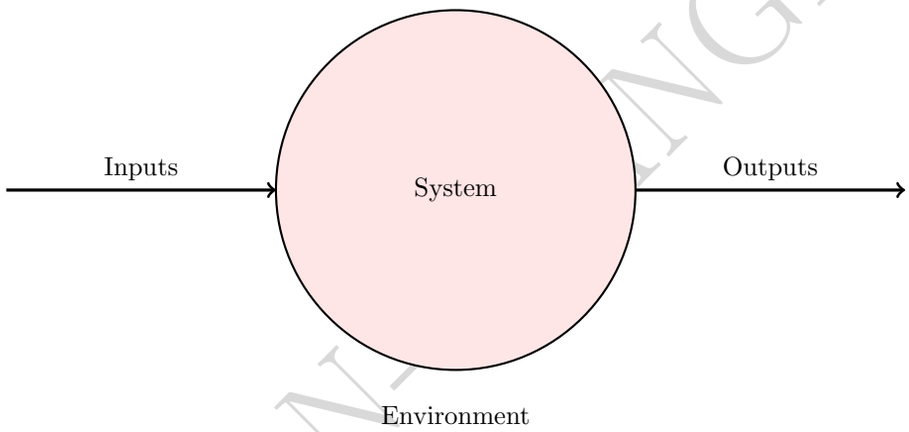


Figure 4.1: figure
View of a system

All of the components of a computer system can be summarized with the simple equation.

COMPUTER SYSTEM = HARDWARE + SOFTWARE+ USER.

- **Hardware = Internal Devices + Peripheral Devices**
  All physical parts of the computer (or everything that we can touch) are known as Hardware.

- **Software = Programs**
  Software gives *"intelligence"* to the computer.

- **USER = Person**, who operates computer.

4.1.1 Types of Computer

A computer is a programmable machine. It allows the user to store all sorts of information and then process that information,or data, or carry out actions with the information, such as calculating numbers or organising words. Computers can be generally classified by size and working principle, although there can be considerable overlap. Following are descriptions of several different types of computers.

Computer as data procesing Systems

1. **Data (pural):** The representation of information in a formalised manner suitable for communication, interpretation and processing, generally by a computer system.
2. **Information:** Knowledge that is communicated.
3. **Computer:** A machine that can receive and store information and change or process it

4.1.1.1 Types of Computer On the basis of working principle

a) **Analog Computer:**An analog computer (spelt analogue in British English) is a form of computer that uses *continuous* physical phenomena such as electrical, mechanical, or hydraulic quantities to model the problem being solved.

b) **Digital Computer:**A computer that performs calculations and logical operations with quantities represented as digits, usually in the binary number system.

c) **Hybrid Computer (Analog + Digital):**A combination of computers those are capable of inputting and outputting in both digital and analog signals. A hybrid computer system setup offers a cost effective method of performing complex simulations.

4.1.1.2 Types of Computer on the basis of Size:

a) **Super Computer:** The fastest type of computer. Supercomputers are very expensive and are employed for specialized applications that require immense amounts of mathematical calculations. For example, weather forecasting requires a supercomputer. Other uses of supercomputers include animated graphics, fluid dynamic calculations, nuclear energy research, and petroleum exploration.
The chief difference between a supercomputer and a mainframe is that a supercomputer channels all its power into executing a few programs as fast as possible, whereas a mainframe uses its power to execute many programs concurrently.

Figure 4.2: Indian-American uses supercomputer to make HIV evolutionary

b) **Mainframe computer:** It is large-sized, powerful multi-user computers that can support concurrent programs. That means, they can perform different actions or processes at the same time. Mainframe computers can be used by as many as hundreds or thousands of users at the same time. Large organisations may use a mainframe

computer to execute large-scale processes such as processing the organisations payroll.
In the hierarchy that starts with a simple microprocessor (in watches, for example) at the bottom and moves to supercomputers at the top, mainframes are just below supercomputers. In some ways, mainframes are more powerful than supercomputers because they support more simultaneous programs. But supercomputers can execute a single program faster than a mainframe.

Figure 4.3: Mainframe computer

c) **Mini Computer:** A midsized computer. In size and power, minicomputers lie between *workstations* and *mainframes*. In the past decade, the distinction between large minicomputers and small mainframes has blurred, however, as has the distinction between small minicomputers and workstations. But in general, a minicomputer is a multiprocessing system capable of supporting from 4 to about 200 users simultaneously.

Figure 4.4: Mini computer

d) **Workstations:** It is powerful, single-user computers. They have the capacity to store and process large quantities of data, but they are only used by one person at a time.However, workstations are typically linked together to form a computer network called a local area network, which means that several people, such as staff in an office,can communicate with each other and share electronic files and data.

Computer network

A grouping of computers and peripherals connected together by telecommunications links to enable a group of users to share and exchange information

A workstation is similar to a personal computer but is more powerful and often comes with a higher-quality monitor. In terms of computing power, workstations lie in between personal computers and mini-computers. Workstations commonly support applications that require relatively high-quality graphics capabilities and a lot of memory, such as desktop publishing, software development and engineering applications.

e) **Micro Computer:** A microcomputer is a computer with a microprocessor as its central processing unit. They are physically small compared to mainframe and minicomputers. Many microcomputers (when equipped with a keyboard and screen for input and output) are also personal computers (in the generic sense).

i) **Desktop Computer:** A personal or micro-mini computer sufficient to fit on a desk.

ii) **Laptop Computer:** A portable computer complete with an integrated screen and keyboard. It is generally smaller in size than a desktop computer and larger than a notebook computer.

iii) **Palmtop Computer/Digital Diary /Notebook /PDAs:** A hand-sized computer. Palmtops have no keyboard but the screen serves both as an input and output device.

4.2 The Generations of Computers

The development of computers started with mechanical and electromechanical devices (17^{th} through 19^{th} century) and has progressed through four generations of computers.

4.2.1 Mechanical Devices:

Blaise Pascal(1623-1662)

One of the earliest mechanical calculating devices was the Pascaline, invented in 1642 by the French philosopher and mathematician Blaise Pascal. The Pascaline was a complicated set of gears that operated similarly to a clock. It was designed to only perform addition.Unfortunately, due to manufacturing problems, Pascal never got the device to work properly. Later in the 17th century Gottfried Wilhelm von Leibniz, a famous mathematician, invented a device that was supposed to be able to add and subtract, as well as multiply, divide, and calculate square roots.His device, the Stepped Reckoner, included a cylindrical wheel called the Leibniz wheel and a moveable carriage that was used to enter the number of digits in the multiplicand. However, because of mechanically unreliable parts, the device tended to jam and malfunction.In 1822 Charles Babbage began work on the Difference Engine, which was intended to calculate numbers to the 20th place and then print them at 44 digits per minute. The original purpose of this machine was to produce tables of numbers that would be used by ships navigators. At the time, navigation tables were often highly inaccurate due to calculation errors and a number of ships were known to have been lost at sea because of these errors. Although never built, the ideas for the Difference Engine led to the design of Babbages Analytical Engine. The Analytical Engine, designed around 1833, was supposed to perform a variety of calculations by following a set of instructions, or program, stored on punched cards. During processing, the Analytical Engine was planned to store information in a memory unit that would allow it to make decisions and then carry out instructions based on those decisions. For example, when comparing two numbers, it could be programmed to determine which was larger and then follow an appropriate set of instructions. The Analytical Engine was also never built, but its design served as a model for the modern computer.

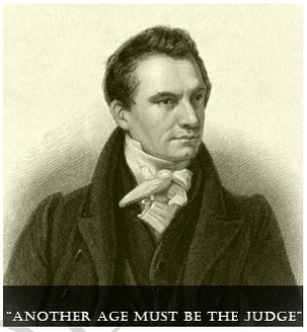
Babbages chief collaborator on the Analytical Engine was Ada Byron, Countess of Lovelace, the daughter of Lord Byron. Interested in mathematics, Lady Byron was a sponsor of the Analytical Engine and one of the first people to realize its power and significance. She also wrote of its achievements in order to gain support for it. Ada Byron is often called the first programmer because she wrote a program based on the design of the Analytical Engine.

Babbage had hoped that the Analytical Engine would be able to think. Ada Byron, however, said that the Engine could never originate anything, meaning that she did not believe that a machine, no matter how powerful, could think. To this day her statement about computing machines remains true.

4.2.2 Electro-Mechanical Devices:

By the end of the 19th century, U.S. Census officials were concerned about the time it took to tabulate the continuously increasing number of Americans. This counting was done every 10 years, as required by the Constitution. However, the Census of 1880 took nine years to compile which made the figures out of date by the time they were published.

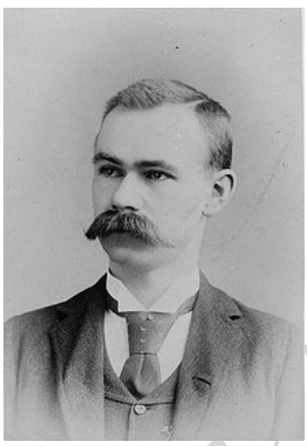
In response to a contest sponsored by the U.S. Census Bureau, Herman Hollerith invented a tabulating machine that used electricity rather than mechanical gears. Holes representing information to be tabulated were punched in cards, with the location of each hole representing a specific piece of information (male, female, age, etc.). The cards were then inserted into the machine and metal pins used to open and close electrical circuits. If a circuit was closed, a counter was increased by one.



Charles Babbage(1792-1871)

Holleriths machine was immensely successful. The general count of the population, then 63 million, took only six weeks to compile. Although the full statistical analysis took seven years, it was still an improvement over the nine years it took to compile the previous census.Based on the success of his tabulating machine, Herman Hollerith started the Tabulating Machine Company in 1896. In 1924, the company was taken over by International Business Machines (IBM)

The first electronic computer was built based on vacuum tube technology between 1939 and 1942 at Iowa State University by John Atanasoff, a math and physics professor, and Clifford Berry, a graduate student. Vacuum tubes were used to perform logic operations and to store data. Generations of computers has been divided into five according to the development of technologies used to fabricate the processors, memories and I/O units.. The Atanasoff-Berry Computer (ABC) used the binary number system of 1s and 0s that is still used in computers today. It contained hundreds of vacuum tubes and stored numbers for calculations by electronically burning holes in sheets of paper. The output of calculations was displayed on an odometer type of device.



Herman Hollerith(1860-1929)

The patent application for the ABC was not handled properly, and it was not until almost 50 years later that Atanasoff received full credit for his invention. In 1990, he was awarded the Presidential Medal of Technology for his pioneering work. A working replica of the ABC was unveiled at the Smithsonian in Washington, D.C. on October 9, 1997.

In June 1943, John Mauchly and J. Presper Eckert began work on the ENIAC (Electronic Numerical Integration and Calculator). It was originally a secret military project which began during World War II to calculate the trajectory of artillery shells. Built at the University of Pennsylvania, it was not finished until 1946, after the war had ended. But the great effort put into the ENIAC was not wasted. In one of its first demonstrations, ENIAC was given a problem that would have taken a team of mathematicians three days to solve. It solved the problem in twenty seconds.

The ENIAC weighed 30 tons and occupied 1500 square feet, the same area taken up by the average three bedroom house. It contained over 17,000 vacuum tubes, which consumed huge amounts of electricity and produced a tremendous amount of heat requiring special fans to cool the room.

The ABC and the ENIAC are first generation computers because they mark the beginning of the computer era.

4.2.3 The Stored Program Computer:

The ABC and ENIAC required wire pulling, replugging, and switch flipping to change their instructions. A breakthrough in the architectural design of first generation computers came as a result of separate publications by Alan Turing and John von Neumann, both mathematicians with the idea of the stored program.

In the late 30s and 40s, Alan Turing developed the idea of a universal machine. He envisioned a computer that could perform many different tasks by simply changing a program rather than by changing electronic components. A program is a sequence of instructions written in a code that the computer understands.

In 1945, John von Neumann presented his idea of the stored program concept. The stored program computer would store computer instructions in a CPU (Central Processing Unit). The CPU consisted of different elements used to control all the functions of the computer electronically so that it would not be necessary to flip switches or pull wires to change instructions.

Together with Mauchly and Eckert, von Neumann designed and built the EDVAC (Electronic Discrete Variable Automatic Computer) and the EDSAC (Electronic Delay Storage Automatic Computer). These computers were

designed to solve many different problems by simply entering new instructions that were stored on paper tape. The instructions were in machine language, which consists of 0s and 1s to represent the status of a switch (0 for off and 1 for on).

The third computer to employ the stored program concept was the UNIVAC (UNIVersal Automatic Computer) built by Mauchly and Eckert. With the UNIVAC came the first computer language called C- 10, which was developed by Betty Holberton. Holberton also designed the first computer keyboard and numeric keypad in an effort to make the computer more user-friendly. The first UNIVAC was sold to the U.S. Census Bureau in 1951.

These first generation computers continued to use many vacuum tubes which made them large and expensive. They were so expensive to purchase and run that only the largest corporations and the U.S. government could afford them. Their ability to perform up to 1,000 calculations per second, however, made them popular.

Summary of First Generation computer

1. Vacuum tubes were used basic arithmetic operations took few milliseconds.
2. Consume more power with limited performance
3. High cost and bulky.
4. Uses assembly languag- to prepare programs. These were translated into machine level language for execution.
5. Mercury delay line memories and Electrostatic memories were used.
6. Fixed point arithmetic was used.
7. Punched cards and paper tape were invented to feed programs and data and to get results..
8. Magnetic tape/magnetic drum were used as secondary memory.
9. Mainly used for scientific computations.

Generation	Period
I Generation	1945 55
II Generation	1955 65
III Generation	1965 75
IV Generation	1975 89
V Generation	1989 to present

Table 4.1: Generation of computer

4.2.4 Second Generation Computers:

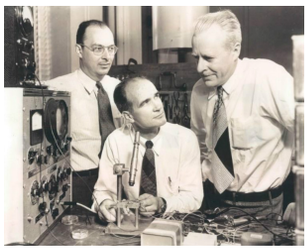
In 1947, William Shockley, John Bardeen, and Walter Brittain of Bell Laboratories invented the transistor. A transistor is a semiconductor device that could replace a vacuum tube. Transistors were much smaller than vacuum tubes, less expensive, and allowed computer to process up to 10,000 calculations per second:

Summary of second Generation computer

1. Transistors were used in place of vacuum tubes. (invented at AT&T Bell lab in 1947)
2. Small in size& Lower cost
3. Lesser power consumption and better performance.
4. Magnetic ferrite core memories were used as main memory which is a random-access nonvolatile memory.
5. Magnetic tapes and magnetic disks were used as secondary memory.
6. Hardware for floating point arithmetic operations was developed.
7. Index registers were introduced which increased flexibility of programming.
8. High level languages such as FORTRAN, COBOL etc were used - Compilers were developed to translate the high-level program into corresponding assembly language program which was then translated into machine language.
9. Separate input-output processors were developed that could operate in parallel with CPU.
10. Punched cards continued during this period also.
11. Increasingly used in business, industry and commercial organizations for preparation of payroll, inventory control, marketing, production planning, research, scientific & engineering analysis and design etc.

In the early 1960s, IBM introduced the first medium-sized computer named the Model 650. It was expensive, but much smaller than first generation computers and still capable of handling the flood of paperwork produced by many government agencies and businesses. Such organizations provided a ready market for the 650, making it popular in spite of its cost.

Second generation computers also saw a change in the way data was stored. Punched cards were replaced by magnetic tape and high speed reel-to-reel tape machines. Using magnetic tape gave computers the ability to read (access) and write (store) data quickly and reliably.Transistors made computers smaller, less expensive, and more reliable than those with vacuum tubes.



John Bardeen, William Shockley and Walter Brattain at Bell Labs, 1948.

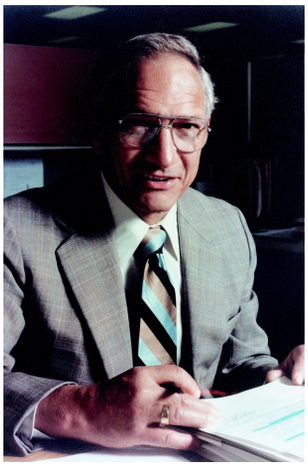
4.2.5 Third Generation Computers:

The use of integrated circuits (ICs) began the third generation of computers. In 1961, Jack Kilby and Robert Noyce, working independently, developed the IC, also called a chip.Noyce developed the integrated circuit while working at Fairchild Semiconductor. In 1968, he formed the company that is now Intel Corporation. Hundreds of transistors, as well as other electronic components and wiring could be housed within a single IC, which allowed computers to process information at a rate of millions of calculations per second.

Summary of third Generation computer

1. ICs were used.
2. Small Scale Integration and Medium Scale Integration technology were implemented in CPU, I/O processors etc.
3. Smaller& better performance
4. Comparatively lesser cost.
5. Faster processors.
6. In the beginning magnetic core memories were used. Later they were replaced by semiconductor memories (RAM & ROM)
7. Introduced microprogramming.
8. Microprogramming, parallel processing (pipelining, multiprocessor system etc), multiprogramming, multi-user system (time shared system) etc were introduced.
9. Operating system software were introduced (efficient sharing of a computer system by several user programs)
10. Cache and virtual memories were introduced (Cache memory makes the main memory appear faster than it really is. Virtual memory makes it appear larger).
11. High level languages were standardized by ANSI eg. ANSI FORTRAN, ANSI COBOL etc.
12. Database management, multi-user application, online systems like closed loop process control, airline reservation, interactive query systems, automatic industrial control etc emerged during this period.

ICs are created from silicon wafers which are then etched with intricate circuits and then coated with a metallic oxide to allow the circuits to conduct electricity. The silicon wafers are housed in special plastic cases that have metal pins. The pins allow the ICs to be plugged into circuit boards that have wiring printed on them.
In 1964, the IBM System 360 was one of the first computers to use integrated circuits and was so popular with businesses that IBM had difficulty keeping up with the demand. Computers had come down in size and price to such a point that smaller organizations such as universities and hospitals could now afford them.



Robert Noyce
1927 1990

4.2.6 Fourth Generation of Computers:

In 1970, Marcian Hoff, an engineer at Intel Corporation, invented the microprocessor, an entire CPU on a single chip. The replacement of several larger components by one microprocessor made possible the fourth generation of computers.

The small microprocessor made it possible to build a computer called a microcomputer, which was small enough to fit on a desktop.The first of these was the Altair built in 1975. In 1976, Stephen Wozniak and Steven Jobs designed and built the first Apple computer. The Apple Macintosh set new standards for ease of computer use with its graphical user interface. In 1981, IBM introduced the IBM-PC. The computer was an instant success because of the availability of spreadsheet, accounting, and word processor software. Desktop computers are referred to as either PCs or Macs.

Advances in technology made personal computers inexpensive and therefore available to many people. Because of these advances almost anyone could own a machine that had more computing power and was faster and more

reliable than either the ENIAC or UNIVAC. As a comparison, if the cost of a sports car had dropped as quickly as that of a computer, a new Porsche would now cost about one dollar.

Summary of fourth Generation computer

1. Microprocessors were introduced as CPU-Complete processors and large section of main memory could be implemented in a single chip.
2. Tens of thousands of transistors can be placed in a single chip (VLSI design implemented)
3. CRT screen, laser& ink jet printers, scanners etc were developed.
4. Semiconductor memory chips were used as the main memory.
5. Secondary memory was composed of hard disks Floppy disks & magnetic tapes were used for backup memory.
6. Parallelism, pipelining cache memory and virtual memory were applied in a better way.
7. LAN and WANS were developed (where desktop work stations interconnected).
8. Introduced Graphical User Interface.
9. Less power consumption.
10. High performance, lower cost and very compact.
11. Much increase in the speed of operation.

4.3 Brief overview of a Computer

Your PC (Personal Computer) is a system, consisting of many components. Some of those components, like Windows XP, and all your other programs, are software. The stuff you can actually see and touch, and would likely break if you threw it out a fifth-story window, is hardware.

Not everybody has exactly the same hardware. But those of you who have a desktop system, like the example shown in Figure 4.5, probably have most of the components shown in that same figure. Those of you with notebook computers probably have most of the same components. Only in your case the components are all integrated into a single book-sized portable unit. The system unit is the actual computer; everything else is called a peripheral

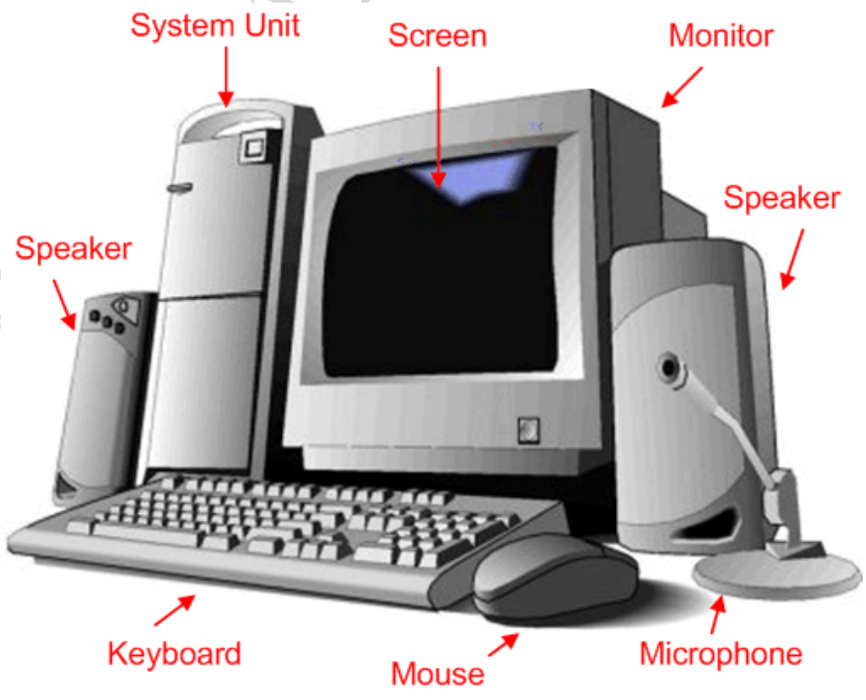


Figure 4.5: View of a Personal computer

device. Your computer's system unit probably has at least one floppy disk drive, and one CD or DVD drive, into

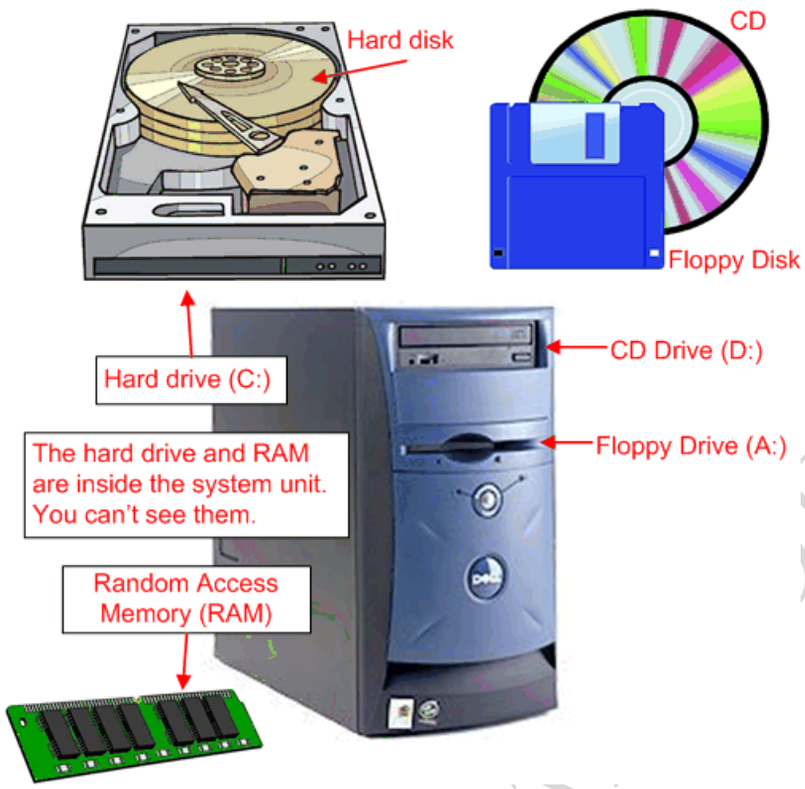


Figure 4.6: View of RAM,Hard drive,Floppy disk

which you can insert floppy disks and CDs. There's another disk drive, called the hard disk inside the system unit, as shown in Figure 4.6. You can't remove that disk, or even see it. But it's there. And everything that's currently "in your computer" is actually stored on that hard disk. (We know this because there is no place else inside the computer where you can store information!).

The floppy drive and CD drive are often referred to as drives with removable media or removable drives for short, because you can remove whatever disk is currently in the drive, and replace it with another. Your computer's hard disk can store as much information as tens of thousands of floppy disks, so don't worry about running out of space on your hard disk any time soon. As a rule, you want to store everything you create or download on your hard disk. Use the floppy disks and CDs to send copies of files through the mail, or to make backup copies of important items.

4.3.1 Different component of a computer

Computers are made up of two parts, the hardware and the software.Hardware is The physical equipment required to run the software. Software is The computerised instructions that operate a computer, manipulate the data and execute particular functions or tasks.

Definition 4.3.1: Computer hardware & software

Computer hardware is any physical device, something that you are able to touch and software is a collection of instructions and code installed into the computer and cannot be touched. For example, the computer monitor you are using to read this text on and the mouse you are using to navigate the web page is computer hardware. The Internet browser that allowed you to visit the web-page and the operating system that the browser is running on is software.

All computers require the following hardware components:

1) **CPU (Central Processor Unit):** The chip or chips at the heart of a computer that enable it to process data.Also known as a processor. It does the 'work', fetches, stores and manipulates values that are stored in the computers memory. Processors come in all different 'shapes and sizes' – there are many different types of architectures which are suited to a variety of different tasks.

2) **Main memory (RAM-Random Access Memory):** An area within a computer system that holds *data*

waiting to be processed. It is used to store values during execution of a program. It can be written to and read from at any time.

3) **Disc drive (hard or floppy):** 'Permanently' stores files (programs and data). Hard discs are generally located inside the machine and come in a variety of different sizes and speeds. They do not, in fact, store files permanently – they often go wrong and so must undergo a back-up at regular intervals. The floppy disc drive allows a user to make his or her own back up of important files and data. It is very important to keep back-ups. Do not be caught out – you may well lose all your work!

4) **VDU (Visual Display Unit):** Visually outputs data. There are numerous types of VDU differing in the resolution (dots per inch) and the number of colours that can be represented.

5) **Printer:** Allows a hard copy to be made. Again, there are many different types of printers available, for example, line printers, dot-matrix printers, bubble jet printers and laser printers. These also differ in their resolution and colour palette.

The central processing unit (CPU) is the heart of the computer. It carries out all of the instructions given in a program, such as a word processing or spreadsheet program. The CPU consists of one or more chips (another name for integrated circuits).

Definition 4.3.2: what is chip

A small piece of semi-conducting material (such as silicon) about 1 centimetre (inch) square on which an integrated circuit is embedded. An integrated circuit is a number of electronic components joined together to form a path for electricity. Central processing unit chips contain the circuits representing the CPU.

CPUs are not all equal. Some process data faster than others. A computer contains a system clock that emits pulses to establish the timing of all systems operations. The system clock operates at a speed quite different from a clock that keeps track of the time of the day. The system clock determines the speed at which the computer can execute an instruction, and therefore limits the number of instructions the computer can complete within a specific amount of time. The time to complete an instruction execution cycle is measured in megahertz (MHz) or millions of cycles per second. Although some instructions require multiple cycles to complete, the processor speed should be thought of in terms of the number of instructions the processor can execute in one second.

4.4 Block diagram of a digital computer

In the diagram, the arrows indicate the direction of data flow.Some data flows in one direction only.In some cases it flows in both directions.At the heart of the computer is the microprocessor.This contains several REGISTERS to store data and an ARITHMETIC LOGIC UNIT (ALU) which manipulates data.It acts as the central processing unit (CPU) of the computer, carrying out a sequence of instructions, called a program.The program may be stored in memory, as software, or written into the memory from tape or disk.

4.4.1 Different types of storage Unit:

The storage unit of the computer holds data and instructions that are entered through the input unit, before they are processed. It preserves the intermediate and final results before these are sent to the output devices. It also saves the data for the later use.

Types of Storage Devices:

1. **Primary Storage:**
   (a) Stores and provides very fast.
   (b) This memory is generally used to hold the program being currently executed in the computer, the data being received from the input unit, the intermediate and final results of the program.
   (c) The primary memory is temporary in nature. The data is lost, when the computer is switched off.
   (d) In order to store the data permanently, the data has to be transferred to the secondary memory. The cost of the primary storage is more compared to the secondary storage.

Definition 4.4.1: Primary storage

1. **Secondary Storage:**
   (a) It stores several programs, documents, data bases etc.
   (b) The programs that run on the computer are first transferred to the primary memory before it is actually run.
   (c) Whenever the results are saved, again they get stored in the secondary memory.
   (d) The secondary memory is slower and cheaper than the primary memory. Some of the commonly used secondary memory devices are Hard disk, CD, etc.

Definition 4.4.2: Secondary storage

4.4.1.1 Memory Size:

All digital computers use the binary system, i.e. 0s and 1s. Each character or a number is represented by an 8 bit code. The set of 8 bits is called a byte. A Character occupies 1 byte space. A numeric occupies 2 byte space. Byte is the space occupied in the memory. The size of the primary storage is specified in KB (Kilobytes) or MB (Megabyte). One KB is equal to 1024 bytes and one MB is equal to 1000KB. The size of the primary storage in a typical PC usually starts at 16MB. PCs having 32 MB, 48MB, 128 MB, 256MB memory are quite common.

4.4.2 Interface:

Memory (ROM) .The computer needs to communicate with the outside world.It does this via interfaces which are usually a plug or socket of some type.The computer is a digital device.It may need to communicate with an analogue device such as a loudspeaker or variable speed control.To do this it uses digital to analogue and analogue to digital converters.

Block diagram of a digital computer

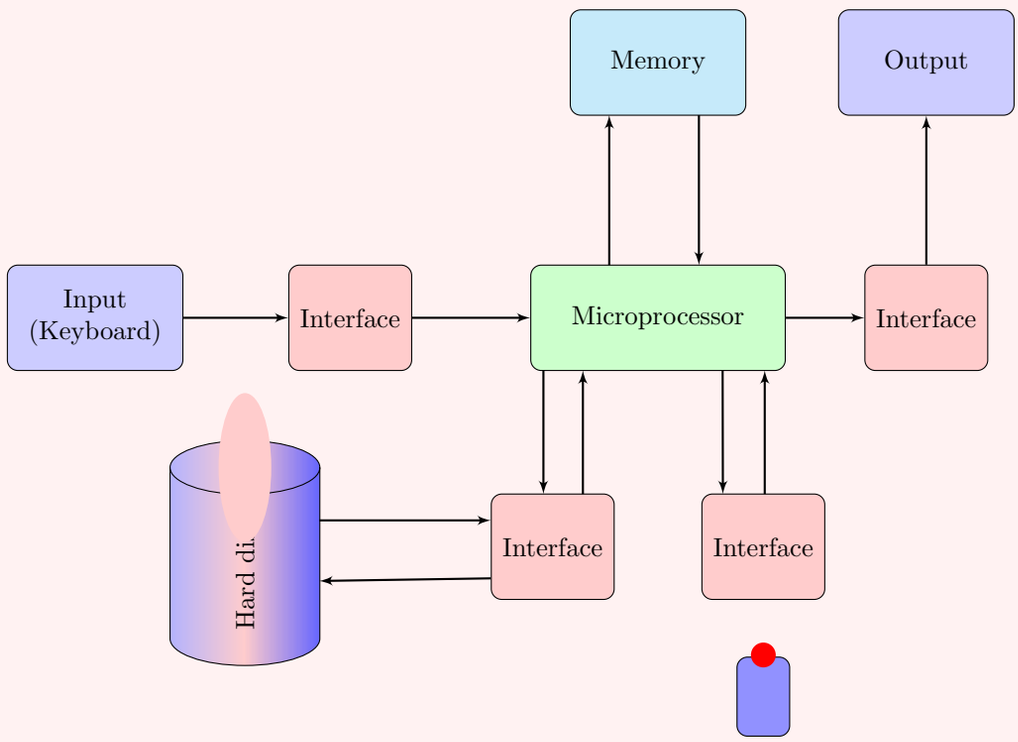


Figure 4.7: Block diagram of a digital computer

4.4.3 Central Processing Unit:

The control unit and ALU of the computer are together known as the Central Processing Unit (CPU). The CPU is like brain performs the following functions:

1. It performs all calculations.
2. It takes all decisions.
3. It controls all units of the computer.

A PC may have CPU-IC such as Intel 8088, 80286, 80386, 80486, Celeron, Pentium, Pentium Pro, Pentium II, Pentium III, Pentium IV, Dual Core, and AMD etc.

4.4.3.1 Control Unit:

It controls all other units in the computer. The control unit instructs the input unit, where to store the data after receiving it from the user. It controls the flow of data and instructions from the storage unit to ALU. It also controls the flow of results from the ALU to the storage unit. The control unit is generally referred as the central nervous system of the computer that control and synchronizes its working.

4.4.3.2 Arithmetic Logical Unit:

All calculations are performed in the Arithmetic Logic Unit (ALU) of the computer. It also does comparison and takes decision. The ALU can perform basic operations such as addition, subtraction, multiplication, division, etc and does logic operations viz $>$, $<$, $=$ etc.

Whenever calculations are required, the control unit transfers the data from storage unit to ALU once the computations are done, the results are transferred to the storage unit by the control unit and then it is send to the output unit for displaying results.

4.4.4 Input & Output Devices

Before a computer can process your data, you need some method to input the data into the machine. The device you use will depend on what form this data takes (be it text, sound, artwork, etc.).

Similarly, after the computer has processed your data, you often need to produce output of the results. This output could be a display on the computer screen, hardcopy on printed pages, or even the audio playback of music you composed on the computer.

The terms input and output are used both as verbs to describe the process of entering or displaying the data, and as nouns referring to the data itself entered into or displayed by the computer.

Below we discuss the variety of peripheral devices used for computer input and output.

4.4.4.1 Input Devices

the devices that allow data and instructions to enter a computer (such as a keyboard, mouse, scanner).*Input* is the Any resource required for the functioning of a process, in the course of which it will be transformed into one or more outputs.

Definition 4.4.3: Input device

Computers need to receive data and instruction in order to solve any problem. Therefore, we need to input the data and instructions into the computers. The input unit consists of one or more input devices. Keyboard is the one of the most commonly used input device. Other commonly used input devices are the mouse, floppy disk drive, magnetic tape, etc. All the input devices perform the following functions.

1. *Accept the data and instructions from the outside world.*
2. *Convert it to a form that the computer can understand.*
3. *Supply the converted data to the computer system for further processing.*

i) **Keyboard:** The keyboard is a means of interacting with your computer. You really only need to use the keyboard when you're typing text. Most of the keys on the keyboard are laid out like the keys on a typewriter. But there are some special keys like Esc (Escape), Ctrl (Control), and Alt (Alternate). There are also some keys across the top of the keyboard labeled F1, F2, F3, and so forth. Those are called the function keys, and the exact role they play depends on which program you happen to be using at the moment.

Most keyboards also have a numeric keypad with the keys laid out like the keys on a typical adding machine. If you're accustomed to using an adding machine, you might want to use the numeric keypad, rather than the numbers across the top of the keyboard, to type numbers. It doesn't really matter which keys you use. The numeric keypad is just there as a convenience to people who are accustomed to adding machines.

Most keyboards also contain a set of navigation keys. You can use the navigation keys to move around around through text on the screen. The navigation keys won't move the mouse pointer. Only the mouse moves the mouse pointer.

On smaller keyboards where space is limited, such as on a notebook computer, the navigation keys and numeric keypad might be one in the same. There will be a Num Lock key on the keypad. When the Num Lock key is "on", the numeric keypad keys type numbers. When the Num Lock key is "off", the navigation keys come into play. The Num Lock key acts as a toggle. Which is to say, when you tap it, it switches to the opposite state. For example, if Num Lock is on, tapping that key turns it off. If Num Lock is off, tapping that key turns Num Lock on.

ii) **The Mouse:** Obviously you know how to use your mouse, since you must have used it to get here. But let's take a look at the facts and buzzwords anyway. Your mouse probably has at least two buttons on it. The button on the left is called the *primary mouse button*, the button on the right is called the *secondary mouse button* or just the *right mouse button*. I'll just refer to them as the left and right mouse buttons. Many mouse have a small wheel between the two mouse buttons, as illustrated in Figure **??**.

The mouse pointing device sits on your work surface and is moved with your hand. In older mice, a ball in the bottom of the mouse rolls on the surface as you move the mouse, and internal rollers sense the ball movement and transmit the information to the computer via the cord of the mouse.

The newer optical mouse does not use a rolling ball, but instead uses a light and a small optical sensor to detect the motion of the mouse by tracking a tiny image of the desk surface. Optical mice avoid the problem of a dirty mouse ball, which causes regular mice to roll unsmoothly if the mouse ball and internal rollers are not cleaned frequently.

A cordless or wireless mouse communicates with the computer via radio waves (often using BlueTooth hardware and protocol) so that a cord is not needed (but such mice need internal batteries).

A mouse also includes one or more buttons (and possibly a scroll wheel) to allow users to interact with the GUI. The traditional PC mouse has two buttons, while the traditional Macintosh mouse has one button. On either type of computer you can also use mice with three or more buttons and a small scroll wheel (which can also usually be clicked like a button). The buzzwords that describe how you use the mouse are as follows:

Point: To point to an item means to move the mouse pointer so that it's touching the item.

Click: Point to the item, then tap (press and release) the left mouse button.

Double-click: Point to the item, and tap the left mouse button twice in rapid succession - click-click as fast as you can.

Right-click: Point to the item, then tap the mouse button on the right.

Drag: Point to an item, then hold down the left mouse button as you move the mouse. To drop the item, release the left mouse button.

Right-drag: Point to an item, then hold down the right mouse button as you move the mouse. To drop the item, release the right mouse button.

iii) **Touch pad:** Most laptop computers today have a touch pad pointing device. You move the on-screen cursor by sliding your finger along the surface of the touch pad. The buttons are located below the pad, but most touch pads allow you to perform mouse clicks by tapping on the pad itself.

Touch pads have the advantage over mice that they take up much less room to use. They have the advantage over trackballs (which were used on early laptops) that there are no moving parts to get dirty and result in jumpy cursor control.

iv) **Trackpoint:** The trackball is sort of like an upside-down mouse, with the ball located on top. You use your fingers to roll the trackball, and internal rollers (similar to whats inside a mouse) sense the motion which is transmitted to the computer. Trackballs have the advantage over mice in that the body of the trackball remains stationary on your desk, so you dont need as much room to use the trackball. Early laptop computers often used trackballs (before superior touch pads came along).

Trackballs have traditionally had the same problem as mice: dirty rollers can make their cursor control jumpy and unsmooth. But there are modern optical trackballs that dont have this problem because their designs eliminate the rollers.

v) **Joysticks:** Joysticks and other game controllers can also be connected to a computer as pointing devices. They are generally used for playing games, and not for controlling the on-screen cursor in productivity software.

vi) **Light pen:** A light pen is a light-sensitive pointing device commonly used to select or otherwise modify text or data on a screen.

The term light pen may also refer to a pointing device utilizing a light that is commonly used during a presentation

vii) **Trackball:** A trackball is a pointing device consisting of a ball held by a socket containing sensors to detect a rotation of the ball about two axeslike an upside-down mouse with an exposed protruding ball. The user rolls the ball with the thumb, fingers, or the palm of the hand to move a pointer. Compared with a mouse, a trackball has no limits on effective travel; at times, a mouse can reach an edge of its working area while the operator still wishes to move the screen pointer farther. With a trackball, the operator just continues rolling. Some trackballs, such as Logitech's optical-pickoff types, have notably low friction, as well as being dense (glass), so they can be spun to make them coast.

viii) **Touch screen:** Some computers, especially small hand-held PDAs, have touch sensitive display screens. The user can make choices and press button images on the screen. You often use a stylus, which you hold like a pen, to write on the surface of a small touch screen.

ix) **Graphics tablet:** A graphics tablet consists of an electronic writing area and a special pen that works with it. Graphics tablets allows artists to create graphical images with motions and actions similar to using more traditional drawing tools. The pen of the graphics tablet is pressure sensitive, so pressing harder or softer can result in brush strokes of different width (in an appropriate graphics program).

x) **Scanners:** A scanner is a device that images a printed page or graphic by digitizing it, producing an image made of tiny pixels of different brightness and color values which are represented numerically and sent to the computer. Scanners scan graphics, but they can also scan pages of text which are then run through OCR (Optical Character Recognition) software that identifies the individual letter shapes and creates a text file of the page's contents.

xi) **Microphone:** A microphone can be attached to a computer to record sound (usually through a sound card input or circuitry built into the motherboard). The sound is digitizedturned into numbers that represent the original analog sound wavesand stored in the computer to later processing and playback.

xii) **MIDI Devices:** MIDI (Musical Instrument Digital Interface) is a system designed to transmit information between electronic musical instruments. A MIDI musical keyboard can be attached to a computer and allow a performer to play music that is captured by the computer system as a sequence of notes with the associated timing (instead of recording digitized sound waves).

4.4.4.2 Output Devices:

An output device receives information from the computer and translates it from machine language to a form that humans can read or so that another machine can read the information. An output device is any piece of computer hardware equipment used to communicate the results of data processing carried out by an information processing system (such as a computer) to the outside world.

Electronic output devices can be mechanical, audio, or visual. Mechanical outputs include motors, solenoids, and other electromagnetic devices. Audio outputs include buzzers, loudspeakers, piezo transducers, and ultrasonic transmitters. Mechanical and audio outputs tend to have a higher power demand than other output devices. Visual outputs include lamps, LEDs (light-emitting diodes), and infrared transmitters.

Definition 4.4.4: Ouput device

The output unit of a computer provides the information and results of a computation to outside world. Printers, Visual Display Unit (VDU) are the commonly used output devices. Other commonly used output devices are floppy disk drive, hard disk drive, and magnetic tape drive.

1. **CRT Monitor:** The traditional output device of a personal computer has been the CRT (Cathode Ray Tube) monitor. Just like a television set (an older one, anyway) the CRT monitor contains a large cathode ray tube that uses an electron beam of varying strength to paint a picture onto the color phosphorescent dots on the inside of the screen. CRT monitors are heavy and use more electrical power than flat panel displays, but they are preferred by some graphic artists for their accurate color rendition, and preferred by some gamers for faster response to rapidly changing graphics.

   Monitor screen size is measured diagonally across the screen, in inches. Not all of the screen area may be usable for image display, so the viewable area is also specified. The resolution of the monitor is the maximum

number of pixels it can display horizontally and vertically (such as 800×600, or 1024×768, or 1600×1200). Most monitors can display several resolutions below its maximum setting. Pixels (short for picture elements) are the small dots that make of the image displayed on the screen. The spacing of the screens tiny phosphor dots is called the dot pitch (dp), typically .28 or .26 (measured in millimeters). A screen with a smaller dot pitch produces sharper images.

Your computer must produce a video signal that a monitor can display. This may be handled by circuitry on the motherboard, but is usually handled by a video card in one of the computers expansion slots; often the slot is a special one dedicated to video use, such as an AGP slot (Accelerated Graphics Port). Video cards are also called video display adapters, and graphics cards. Many video cards contain separate processors and dedicated video memory for generating complex graphics quickly without burdening the CPU. These accelerated graphics cards are loved by gamers.

2. **Flat Panel Monitor:** A flat panel display usually uses an LCD (Liquid Crystal Display) screen to display output from the computer. The LCD consists of several thin layers that polarize the light passing through them. The polarization of one layer, containing long thin molecules called liquid crystals, can be controlled electronically at each pixel, blocking varying amounts of the light to make a pixel lighter or darker. Other types of flat panel technology exist (such as plasma displays) but LCDs are most commonly used in computers, especially laptops.

   Older LCDs had slow response times and low contrast, but active matrix LCD screens have a transparent thin film transistor (TFT) controlling each pixel, so response, contrast, and viewing angle are much improved.

   Flat panel displays are much lighter and less bulky than CRT monitors, and they consume much less power. They have been more expensive than CRTs in the past, but the price gap is narrowing. You will see many more flat panels in the future.

   As with CRTs, the display size of a flat panel is expressed in inches, and the resolution is the number of pixels horizontally and vertically on the display.

3. **Ink Jet Printer:** For hardcopy (printed) output, you need some kind of printer attached to your computer (or available over a network). The most common type of printer for home systems is the color ink jet printer. These printers form the image on the page by spraying tiny droplets of ink from the print head. The printer needs several colors of ink (cyan, yellow, magenta, and black) to make color images. Some photo-quality ink jet printers have more colors of ink.

   Ink jet printers are inexpensive, but the cost of consumables (ink cartridges and special paper) make them costly to operate in the long run for many purposes.

4. **Laser Printer:** A laser printer produces good quality images by the same technology that photocopiers use. A drum coated with photosensitive material is charged, then an image is written onto it by a laser (or LEDs) which makes those areas lose the charge. The drum then rolls through toner (tiny plastic particles of pigment) that are attracted to the charged areas of the drum. The toner is then deposited onto the paper, and then fused into the paper with heat.

   Most laser printers are monochrome (one color only, usually black), but more expensive laser printers with multiple color toner cartridges can produce color output.

   Laser printers are faster than ink jet printers. Their speed is rated in pages per minute (ppm). Laser printers are more expensive than ink jets, but they are cheaper to run in the long term if you just need good quality black & white pages.

5. **Other Printers:** Multi-function printers are available that not only operate as a computer printer, but also include the hardware needed to be a scanner, photocopier, and FAX machine as well.

6. **Dot matrix printer:** It use small electromagnetically activated pins in the print head, and an inked ribbon, to produce images by impact. These printers are slow and noisy, and are not commonly used for personal computers anymore (but they can print multi-layer forms, which neither ink jet or laser printers can).

7. **Sound Output:** Computers also produce sound output, ranging from simple beeps alerting the user, to impressive game sound effects, to concert quality music. The circuitry to produce sound may be included on the motherboard, but high quality audio output from a PC usually requires a sound card in one of the expansion slots, connected to a set of good quality external speakers or headphones.

   Multimedia is a term describing computer output that includes sound, text, graphics, movies, and animation. A sound card is an example of a multimedia output device (as is a monitor that can display graphics).

4.5 How does the computer work?

Software is the computerised instructions that operate the computer, execute particular functions or tasks, and manipulate the data. For software (the instructions) to perform various functions, it must be programmed. That is, the instructions need to be written in a programming language that the computer can understand. Without a program, a computer is useless.

Definition 4.5.1: What is a programming language

Programming language: *An artificial set of rules, vocabulary and syntax used to instruct the computer to execute certain tasks.A programming language is a computer language,programmers use to develop applications, scripts, or other set of instructions for a computer to execute.*

The language the computer actually understands is called machine language, which comprises numbers only. This language is used by the computer to understand the programming language and translate the terms into executable instructions. Lying between programming languages and machine languages are assembly languages. Assembly languages have the same structure and set of commands as machine languages but they enable a program to use names instead of numbers.
There are two kinds of software, systems software and applications software.Systems software includes the operating system and all the utilities that enable the computer to function. The most important program that runs on a computer is the operating system. Every general-purpose computer must have an operating system in order to run other programs. This includes controlling functions such as the coordination of the hardware and applications software, allocating storage facilities, controlling the input and output devices and managing time sharing for linked or networked computers.

Definition 4.5.2: Program

Computer program: *A computer is nothing but a very dumb machine that has the ability to perform mathematical operations very rapidly and very accurately, but it can do nothing without the aid of a program written by a human being. Moreover, if the human being writes a program that turns good data into garbage, the computer will very obediently, and very rapidly turn good data into garbage. It is possible to write a large program with one small error that will do just that. In some cases the error will be obvious, but if the error is subtle, the answers may appear to be right, and the error will go unnoticed. It is up to you, the human programmer, to write a correct program to tell the computer what to do. You can think of the computer as your very obedient slave ready to do your every whim. It is up to you to tell your slave what you want it to do.*
A computer program is a "recipe" which the computer will use on the input data to derive the desired output data. It is similar to the recipe for baking a cake. The input data is comparable to the ingredients, including the heat supplied by the oven. The program is comparable to the recipe instructions to mix, stir, wait, heat, cool, and all other possible operations on the ingredients. The output of the computer program can be compared to the final cake sitting on the counter ready to be cut and served. A computer then is composed of two parts, the data upon which the program operates, and the data. The data and program are inseparable as implied by the last sentence.

4.5.1 Software

Computers seem to perform amazing feats as they process information and display output almost instantly; but behind the scenes, they are really very simpleminded devices. All they do is plod along executing long strings of instructions that were previously written by a clever human programmer. The thing that makes a computers performances seem so amazing is that it executes these instructions very, very, very quickly, accurately, and tirelessly. Computers arent smart; they are just FAST.

But computers cant do ANYTHING without step-by-step instructions written out for them. These lists of instructions are called programs. Programs (and the associated data) are known as software. Software needs to be installed onto a computer before it can be used. Software is often sold in sets of several programs and associated data called a software package, and typically comes on a CD-ROM or may be downloaded from the Internet. The Microsoft Office Suite is such a collection of programs and data that allows users to manipulate words, numbers, and data.

There are two major categories of software: System software and Application software.

4.5.1.1 System Software

System software controls a computers operations and manages a computers resources. System software includes the operating system, utilities, and computer programming tools.

The operating system (OS) controls the allocation of hardware resources such as memory space and CPU processing time, and handles the basic input and output (I/O) for data flowing from and to storage devices (such as hard disks) and peripherals (such as your keyboard). The operating system allows application software to access system resources without the applications having to know the details about the system hardware. The operating system often allocates resources and processing time between several programs which are running at once, which is called multitasking. Multitasking allows you to perform multiple tasks at the same time, such copying a chart from an open Excel document and pasting it into a report you have open in Word, all while your web browser is downloading a large file from the Internet in the background. It is the OS that plays traffic cop in this situation, deciding which program gets time on the CPU when, and handles the flow of data.

System software also includes the software needed to access a peripheral device connected to the computer. Such software is called a device driver, and it controls I/O to the peripheral. The device drivers may come already installed in the OS, or you may have to install or update a driver when you add a new peripheral device.

System software may also include security software, such as Virus checkers and firewalls. A virus checker searches files for potentially harmful programs such as viruses, worms, or trojan horses that are written by malicious programmers. Viruses and similar programs can perform disastrous activities on your computer system, such as erasing your hard disk. To be safe, you should scan all downloaded files and messages on your PC (anti-virus software can automatically do this) and never run any e-mail attachments if you dont know what they are. (Note: There are vastly fewer viruses that affect Macintosh computers than affect PCs.) A firewall, or similar program, protects your computer from unauthorized access over a network or telecom connection.

Utilities are programs that perform a very specific task, usually related to managing system resources such as disk drives, printers, etc. Unlike application software, utilities tend to be smaller in size and perform activities related to the computer system (scanning for viruses, manipulating file settings, scanning for disk errors, etc.). Some utilities are memory-resident programs that are loaded into RAM and operate in the background.

System software also includes the tools used to write other programs. These include compilers, assemblers, and debuggers for various computer programming languages. A programming language allows a person to write computer instructions in a language that is easier for a human to understand, but which is then converted into the low level numerical instruction codes that a computer processor unit can execute. Some programming languages include C, C++, Java, FORTRAN, COBOL, PASCAL, BASIC, Visual Basic (and such scripting languages as JavaScript and Perl)

4.5.1.2 Application Software

Application software runs on top of the operating system and allows the user to perform a specific task, such as word processing a letter, calculating a payroll in a spreadsheet, manage a database of information, reading e-mail messages, or manipulating digital photographs. Most applications allow the production and editing of documents (which are the data files created by the application programs). The document files (such as a report created in Word, or a PowerPoint presentation, or a budget spreadsheet) can then be printed, displayed on a screen, or transmitted to other locations.

Applications (and other programs) are stored on your PC as executable files (they contain program steps that the computer can execute); documents are stored as data files. **Applications software** includes programs that users access to carry out work. They include applications for the following functions.

1. Word processing is the most common applications software. The great advantage of word processing over using a typewriter is that you can make changes without retyping the entire document. Word processors make it easy to manipulate and format documents.

2. Spreadsheets are computer programs that let people electronically create and manipulate spreadsheets (tables of values arranged in rows and columns with predefined relationships to each other). Spreadsheets are used for mathematical calculations such as accounts, budgets, statistics and so on.

3. Database management applications are computer programs that let people create and manipulate data in a database. A database is a collection of related information that can be manipulated and used to sort information, conduct statistical analyses or generate reports.

4. Presentation packages and graphics are computer programs that enable users to create highly stylised images for slide presentations and reports. They can also be used to produce various types of charts and graphs. Many software applications include graphics components including: paint programs, desktop publishing applications and so on.

5. Communications applications typically include software to enable people to send faxes and emails and dial into other computers.

4.6 Operating system

This section provides an overview of Operating System principles. We begin with Objectives, Functions and Services of Operating System, which serves to define the requirements that an operating system is intended to meet. We will also see how the resources are effectively managed by operating system. Then we will focus on how an operating system evolved from Simple batch system to Multiprogrammed, and Timesharing systems.

4.6.1 Introduction to Operating System

An operating system is a program that controls the execution of application programs and acts as an interface between the user of a computer and the computer hardware. In other words The software that controls the hardware. Some examples of operating systems are UNIX, Mach, MS-DOS, MS-Windows, Windows/NT, OS/2, MacOS, VMS, MVS, and VM.

Controlling the computer involves software at several levels. We will differentiate kernel services, library services, and application-level services, all of which are part of the operating system. Processes run Applications, which are linked together with libraries perform standard services. The kernel supports the processes by providing a path to the peripheral devices. The kernel responds to service calls from the processes and interrupts from the devices. The core of the operating system is the kernel, a control program that functions in privileged state (an execution context that allows all hardware instructions to be executed), reacting to interrupts from external devices and to service requests and traps from processes. Generally, the kernel is a permanent resident of the computer. It creates and terminates processes and responds to their request for service. Operating Systems are resource managers. The main resource is computer hardware in the form of processors, storage, input/output devices, communication devices, and data.

Definition 4.6.1: What is operating system

Operating system:

1. *A program that is executed by the processor that frequently relinquishes control and must depend on the processor to regain control.*
2. *A program that mediates between application programs and the hardware*
3. *A set of procedures that enable a group of people to use a computer system.*
4. *A program that controls the execution of application programs*
5. *An interface between applications and hardware*

4.6.1.1 Functions of an operating system

The basic functions of an operating system are:

1. Booting the computer.
2. Performs basic computer tasks eg managing the various peripheral devices eg mouse, keyboard.
3. Provides a user interface, e.g. command line, graphical user interface (GUI) Handles system resources such as computer's memory and sharing of the central processing unit (CPU) time by various applications or peripheral devices.
4. Provides file management which refers to the way that the operating system manipulates, stores, retrieves and saves data.

Booting the computer

The process of starting or restarting the computer is known as booting. A cold boot is when you turn on a computer that has been turned off completely. A warm boot is the process of using the operating system to restart the computer.

Performs basic computer tasks

The operating system performs basic computer tasks, such as managing the various peripheral devices such as the mouse, keyboard and printers. For example, most operating systems now are plug and play which means a device such as a printer will automatically be detected and configured without any user intervention.

Provides a user interface

A user interacts with software through the user interface. The two main types of user interfaces are: command line and a graphical user interface (GUI). With a command line interface, the user interacts with the operating system by typing commands to perform specific tasks. An example of a command line interface is DOS (disk operating system). With a graphical user interface, the user interacts with the operating system by using a mouse to access windows, icons, and menus. An example of a graphical user interface is Windows Vista or Windows 7.

The operating system is responsible for providing a consistent application program interface (API) which is important as it allows a software developer to write an application on one computer and know that it will run on another computer of the same type even if the amount of memory or amount of storage is different on the two machines.

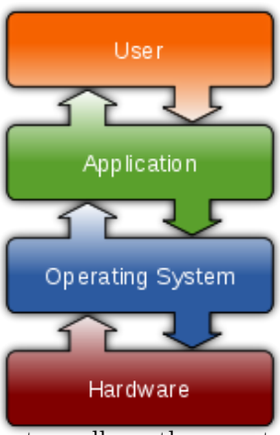


Figure 4.8: **Operating system**

Handles system resources

The operating system also handles system resources such as the computer's memory and sharing of the central processing unit (CPU) time by various applications or peripheral devices. Programs and input methods are constantly competing for the attention of the CPU and demand memory, storage and input/output bandwidth. The operating system ensures that each application gets the necessary resources it needs in order to maximise the functionality of the overall system.

Provides file management

The operating system also handles the organisation and tracking of files and directories (folders) saved or retrieved from a computer disk. The file management system allows the user to perform such tasks as creating files and directories, renaming files, coping and moving files, and deleting files. The operating system keeps track of where files are located on the hard drive through the type of file system. The type two main types of file system are File Allocation table (FAT) or New Technology File system (NTFS).

4.6.2 The History of Operating Systems

Operating systems have evolved through a number of distinct phases or generations, which corresponds roughly to the decades.

The 1940's - First Generations

The earliest electronic digital computers had no operating systems. Machines of the time were so primitive that programs were often entered one bit at time on rows of mechanical switches (plug boards). Programming languages were unknown (not even assembly languages).

The 1950's - Second Generation

By the early 1950's, the routine had improved somewhat with the introduction of punch cards. The General Motors Research Laboratories implemented the first operating systems in early 1950's for their IBM 701. The system of the 50's generally ran one job at a time. These were called single-stream batch processing systems because programs and data were submitted in groups or batches.

The 1960's - Third Generation

The systems of the 1960's were also batch processing systems, but they were able to take better advantage of the computer's resources by running several jobs at once. So operating systems designers developed the concept of multiprogramming in which several jobs are in main memory at once; a processor is switched from job to job as needed to keep several jobs advancing while keeping the peripheral devices in use.

For example, on the system with no multiprogramming, when the current job paused to wait for other I/O operation to complete, the CPU simply sat idle until the I/O finished. The solution for this problem that evolved

was to partition memory into several pieces, with a different job in each partition. While one job was waiting for I/O to complete, another job could be using the CPU.

Another major feature in third-generation operating system was the technique called SPOOLing (simultaneous peripheral operations on line). In spooling, a high-speed device like a disk interposed between a running program and a low-speed device involved with the program in input/output. Instead of writing directly to a printer, for example, outputs are written to the disk. Programs can run to completion faster, and other programs can be initiated sooner when the printer becomes available, the outputs may be printed.

Another feature present in this generation was time-sharing technique, a variant of multiprogramming technique, in which each user has an on-line (i.e., directly connected) terminal. Because the user is present and interacting with the computer, the computer system must respond quickly to user requests, otherwise user productivity could suffer. Timesharing systems were developed to multiprogram large number of simultaneous interactive users.

Fourth Generation

With the development of LSI (Large Scale Integration) circuits, chips, operating system entered in the system entered in the personal computer and the workstation age. Microprocessor technology evolved to the point that it became possible to build desktop computers as powerful as the mainframes of the 1970s. Two operating systems have dominated the personal computer scene: MS-DOS, written by Microsoft, Inc. for the IBM PC and other machines using the Intel 8088 CPU and its successors, and UNIX, which is dominant on the large personal computers using the Motorola 6899 CPU family.

4.7 Some Basic Terminology

It is necessary to cover some terminology. Hopefully, much of it will be familiar – you will hear many of the terms used throughout the course

- **Bit**– is the smallest piece of information used by the computer. Derived from "binary digit". In computer language, is short for Binary Digit. Bits have value of 1 or 0, (or on or off, or, true or false).
- 8 Bits make up 1 **Byte**.

  1024 Bytes make up 1 KByte (1 KiloByte or 1K), (Because $2^{10} = 1024$).

  1024 KBytes make up 1 MByte (1 MagaByte or 1M).

  1024 MBytes make up 1 GByte (1 GigaByte or 1G).
- All machines have a wordsize – a fundamental unit of storage, for example, 8-bits, 16-bits, etc. The size of a word (in Bytes) differs between machines. A Pentium based machine is 32-bit.
- parallel processing occurs when two or more CPUs work on solution of the same problem at the same time
- **Access time**–The performance of a hard drive or other storage device– how long it takes to locate a file.
- **Active program or window**– The application or window at the front (foreground) on the monitor.
- **Alert box**– a message that appears on screen, usually to tell you something went wrong.
- **Application**– a program in which you do your work.
- **ASCII** (pronounced ask-key)– American Standard Code for Information Interchange. a commonly used data format for exchanging information between computers or programs.
- **Boot**– to start up a computer.
- **Bug** –A programming error that causes a program to behave in an unexpected way.
- **Bus** –An electronic pathway through which data is transmitted between components in a computer.
- **Card**– a printed circuit board that adds some feature to a computer.
- **CD-ROM**– An acronym for Compact Disc Read-Only Memory.
- **Clock Rate (MHz)**– The instruction processing speed of a computer measured in millions of cycles per second (i.e., 200 MHz).
- **Compiler**– a program the converts programming code into a form that can be used by a computer.

- **Compression**– a technique that reduces the size of a saved file by elimination or encoding redundancies (i.e., JPEG, MPEG, LZW, etc.)
- **Control panel**– a program that allows you to change settings in a program or change the way a Mac looks and/or behaves.
- **CPU**– the Central Processing Unit. The processing chip that is the "brains" of a computer.
- **Crash**– a system malfunction in which the computer stops working and has to be restarted.
- **Cursor**– The pointer, usually arrow or cross shaped, which is controlled by the mouse.
- **Daisy chaining** – the act of stringing devices together in a series (such as SCSI).
- **Windows:**
  i. The most widely used operating system for personal computers from Microsoft. (Software only. Other companies manufacture the hardware that runs the Windows Operating System.) Compare Macintosh. (Windows with a large "W".)
  ii. The thing you see on screen that contains a directory listing or the contents of a document. (Window with a small "w".)
- **Trash:** Place where you put files and folders that you want to delete or get rid of.
- **System files:** Allows our computer to work.
- **Software:** Instructions that tell the computer what to do.
- **Shut down:** To quit all applications and turn off the computer
- **Scroll bar:** Allows you to move around through your document.
- **Save As :** Give the file a name and/or store the file in a certain place.
- **Save:** Tell the computer to create a file on disk that has the information you've put into the document (usually typing).
- **Right click:** To press the right button on the mouse. (This is Windows specific. On a Mac running System 8 or higher, you hold down the Control key and then click to get the same effect.)
- **Recycle Bin:** Place where you put files and folders that you may later want to delete or get rid of. Compare Trash.
- **Random Access Memory (RAM):** This stands for Random Access Memory. You can think of this as the "space" where you computer does its processing. The more space you have the more processes you can run at the same time. More RAM is always better than less. You can never have much RAM.
- **Pointer (Cursor):** The name of the arrow (or other shape) that tracks across the screen as you move the mouse (or other pointing device) around.
- **Operating System (OS):** System software that allows your computer to work.
- **Mouse:** Pointing device that allows you to tell the computer what to do.
- **MegaHertz (Mhz):** This stands for MegaHertz. A hertz is an electronics term. 1 hz = one cycle (or wavelength) per second. 1 megahertz = 1,000,000 cycles per second. In computer jargon, Mhz measures how *fast* your CPU chip runs. Although it's more important to know the chip than the speed, if you're comparing the same kind of CPU chip then a higher / faster CPU speed (measured in MHz) is better than a slower speed.
- **Macintosh:** The brand name of a family of personal computers (hardware) and an operating system (software) from Apple, introduced in 1984.
- **Keyboard:** This if the primary text input device. It also contains certain standard function keys, such as the Escape key, tab, and arrow keys, shift and control keys, and sometimes other manufacturer-customized keys.
- **Icons:** In a graphical user interface (GUI), a small, pictorial, on screen representation of an object, such as a document, program, folder or disk drive.

- **Folder (Directory, Sub-Directory):** Allows you to organize files and other folders.
- **Folder Icons:** Collections of documents and other folders.
- **Edit:** To make a change to existing data
- **Drag:** To move an object on screen in which its complete movement is visible from starting location to destination.
- **Double Click:** To press the mouse button twice in rapid succession without moving the mouse between clicks.
- **Documents:** Files you create and edit.
- **Disk Space:** This is the place where your files live. The greater the disk space the more files you can keep.More disk space is always better than less. You can never have much disk space.
- **Desktop:** An on-screen representation of a desktop such as used in the Macintosh and Windows operating systems.
- **Delete:** To remove an item of data from a file or to remove a file from the disk.
- **Creating A File:** Storing data as a file with an assigned file name that is unique within the directory it resides in.
- **Crash:** Your computer or application no longer works correctly and so you "loose" all the work you've done since the last time you saved.
- **Central Processor Unit (CPU) :**This term has two meanings
  i. Central Processor Unit−the main chip on the computer that makes everything go.
  ii. The box that holds the guts of the computer.

  A faster CPU is always better than a slower one. You can never have too fast of a CPU.
- **Compute:** A general-purpose machine that processes data according to a set of instructions that are stored internally either temporarily or permanently.
- **WORM:** Acronym for Write Once-Read Many; an optical disk that can only be written to once (like a CD-ROM).
- **vaporware :** "software" advertised, and sometimes sold, that does not yet exist in a releasable for.
- **UPS:**acronym for *"Uninterruptible Power Source"*,a constantly charging battery pack which powers the computer. A UPS should have enough charge to power your computer for several minutes in the event of a total power failure, giving you time to save your work and safely shut down.
- **upload:** To send a file from one computer to another through a network.
- **title bar**the horizontal bar at the top of a window which has the name of the file or folder it represents.
- **System folder:** an all-important folder that contains at least the System file.
- **System file:**a file in the System folder that allows your Mac to start and run.
- **start up disk:** the disk containing system software and is designated to be used to start the computer.
- **spreadsheet:** a program designed to look like an electronic ledger as in Excel.
- **server:**a central computer dedicated to sending and receiving data from other computers (on a network).
- **serial port:** a port that allows data to be transmitted in a series (one after the other), such as the printer and modem ports on a Mac.
- **SCSI:** acronym for Small Computer System Interface.
- **SCSI address:** a number between zero and seven that must be unique to each device in a SCSI chain. Fast and Wide SCSI devices will allow up to 15 SCSI Ids (hexidecimal); however, the length restriction (3 meters) is such that it is virtually impossible to link 15 devices together.

- **SCSI port:** a 25 pin connector on the back of a Mac (native SCSI port); used to connect SCSI devices to the CPU.
- **root directory:**the main hard drive window.
- **ROM:**acronym for Read Only Memory; memory that can only be read from and not written to.
- **RISC:** acronym for Reduced Instruction Set Computing; the smaller set of commands used by the PowerPC and Power Mac.
- **RAM:**Acronym for Random-Access Memory.
- **QuickTime:**the Apple system extension that gives one the ability to compress, edit and play animation, movies and sound on the Mac.
- **print spooler:** a program that stores documents to be printed on the hard drive, thereby freeing the memory up and allowing other functions to be performed while printing goes on in the background.
- **PCI:**acronym for Peripheral Component Interchange - the newer, faster bus achitecture.
- **paste:** to insert text, or other material, from the clipboard or copy buffer.
- **partition:** a subdivision of a hard drives surface that is defined and used as a separate drive.
- **optical disk:** a high-capacity storage medium that is read by a laser light.
- **nanosecond:**one billionth of a second.
- **multi tasking:** running more than one application in memory at the same time.
- **memory:** the temporary holding area where data is stored while it is being used or changed; the amount of RAM a computer has installed.
- **megabyte:**1024 kilobytes.
- **Measurements (summary)**
- **database:**an electronic list of information that can be sorted and/or searched.
- **defragment:** to concatenate fragments of data into contiguous blocks in memory or on a hard drive.
- **digitize:**to convert linear, or analog, data into digital data which can be used by the computer.
- **disk:**a spinning platter made of magnetic or optically etched material on which data can be stored.
- **disk drive:** the machinery that writes the data from a disk and/or writes data to a disk.
- **DOS:**acronym for Disk Operating System - used in IBM PCs.
- **DPI:** acronym for Dots Per Inch - a gauge of visual clarity on the printed page or on the computer screen.
- **download:** to transfer data from one computer to another. (If you are on the receiving end, you are downloading. If you are on the sending end, you are uploading).
- **driver:**a file on a computer which tells it how to communicate with an add-on piece of equipment (like a printer).
- **Ethernet:**a protocol for fast communication and file transfer across a network.
- **font :**a typeface that contains the characters of an alphabet or some other letterforms.
- **fragmentation:**The breaking up of a file into many separate locations in memory or on a disk.
- **freeze:** a system error which causes the cursor to lock in place.
- **hard drive:**a large capacity storage device made of multiple disks housed in a rigid case.
- **head crash:** a hard disk crash caused by the heads coming in contact with the spinning disk(s).
- **icon:** a graphic symbol for an application, file or folder.
- **Measurements:**

* 1024 bytes =one kilobyte
* K= kilobyte
* Kb = kilobit
* MB= megabyte
* Mb= megabit
* MB/s = megabytes per second
* Mb/s= megabits per second
* bps= bits per second

155 Mb/s = 19.38 MB/s

4.8 Some shortcut command

Command name	**Shortcut key**
All Caps	CTRL+SHIFT+A
Annotation	ALT+CTRL+M
App Maximize	ALT+F10
App Restore	ALT+F5
Apply Heading1	ALT+CTRL+1
Apply Heading2	ALT+CTRL+2
Apply Heading3	ALT+CTRL+3
Apply List Bullet	CTRL+SHIFT+L
Auto Format	ALT+CTRL+K
Auto Text	F3 or ALT+CTRL+V
Bold	CTRL+B or CTRL+SHIFT+B
Bookmark	CTRL+SHIFT+F5
Browse Next	CTRL+PAGE DOWN
Browse Previous	CTRL+PAGE UP
Browse Sel	ALT+CTRL+HOME
Cancel	ESC
Center Para	CTRL+E
Change Case	SHIFT+F3
Char Left	LEFT
Char Left Extend	SHIFT+LEFT
Char Right	RIGHT
Char Right Extend	SHIFT+RIGHT
Clear	DELETE
Close or Exit	ALT+F4
Close Pane	ALT+SHIFT+C
Column Break	CTRL+SHIFT+ENTER
Column Select	CTRL+SHIFT+F8
Copy	CTRL+C or CTRL+INSERT
Copy Forma	t CTRL+SHIFT+C
Copy Text	SHIFT+F2
Create Auto Tex	t ALT+F3
Customize Add Menu	ALT+CTRL+=
Customize Keyboard	ALT+CTRL+NUM +
Customize Remove Menu	ALT+CTRL+-
Cut	CTRL+X or SHIFT+DELETE
Date Field	ALT+SHIFT+D
Delete Back Word	CTRL+BACKSPACE
Delete Word	CTRL+DELETE
Dictionary	ALT+SHIFT+F7
Do Field	Click ALT+SHIFT+F9
Doc Close	CTRL+W or CTRL+F4
Doc Maximize	CTRL+F10
Doc Move	CTRL+F7

Doc Restore	CTRL+F5
Doc Size	CTRL+F8
Doc Split	ALT+CTRL+S
Double Underline	CTRL+SHIFT+D
End of Column	ALT+PAGE DOWN
End of Column	ALT+SHIFT+PAGE DOWN
End of Doc Extend	CTRL+SHIFT+END
End of Document	CTRL+END
End of Line	END
End of Line Extend	SHIFT+END
End of Row	ALT+END
End of Row	ALT+SHIFT+END
End of Window	ALT+CTRL+PAGE DOWN
End of Window Extend	ALT+CTRL+SHIFT+PAGE DOWN
Endnote Now	ALT+CTRL+D
Extend Selection	F8
Field Chars	CTRL+F9
Field Codes	ALT+F9
Find	CTRL+F
Font	CTRL+D or CTRL+SHIFT+F
Font Size Select	CTRL+SHIFT+P
Footnote Now	ALT+CTRL+F
Go Back	SHIFT+F5 or ALT+CTRL+Z
Go To	CTRL+G or F5
Grow Font	CTRL+SHIFT+.
Grow Font One Point	CTRL+]
Hanging Indent CTRL+T	
Header Footer Link	ALT+SHIFT+R
Help	F1
Hidden	CTRL+SHIFT+H
Hyperlink	CTRL+K
Indent	CTRL+M
Italic	CTRL+I or CTRL+SHIFT+I
Justify Para	CTRL+J
Left Para	CTRL+L
Line Down	DOWN
Line Down Extend	SHIFT+DOWN
Line Up	UP
Line Up Extend	SHIFT+UP
List Num Field	ALT+CTRL+L
Lock Fields	CTRL+3 or CTRL+F11
Macro	ALT+F8
Mail Merge Check	ALT+SHIFT+K
Mail Merge Edit Data Source	ALT+SHIFT+E
Mail Merge to Doc	ALT+SHIFT+N
Mail Merge to Printer	ALT+SHIFT+M
Mark Citation	ALT+SHIFT+I
Mark Index Entry	ALT+SHIFT+X
Mark Table of Contents Entry	ALT+SHIFT+O
Menu Mode	F10
Merge Field	ALT+SHIFT+F
Microsoft Script Editor	ALT+SHIFT+F11
Microsoft System Info	ALT+CTRL+F1
Move Text	F2
New	CTRL+N
Next Cell	TAB
Next Field	F11 or ALT+F1
Next Misspelling	ALT+F7
Next Object	ALT+DOWN
Next Window	CTRL+F6 or ALT+F6
Normal	ALT+CTRL+N

Normal Style	CTRL+SHIFT+N or ALT+SHIFT+CLEAR (NUM 5) Open CTRL+O or CTRL+F12 or AL
Open or Close Up Para	CTRL+0
Other Pane	F6 or SHIFT+F6
Outline	ALT+CTRL+O
Outline Collapse	ALT+SHIFT+- or ALT+SHIFT+NUM
Outline Demote	ALT+SHIFT+RIGHT
Outline Expand	ALT+SHIFT+=
Outline Expand	ALT+SHIFT+NUM +
Outline Move Down	ALT+SHIFT+DOWN
Outline Move Up	ALT+SHIFT+UP
Outline Promote	ALT+SHIFT+LEFT
Outline Show First Line	ALT+SHIFT+L
Overtype	INSERT
Page	ALT+CTRL+P
Page Break	CTRL+ENTER
Page Down	PAGE DOWN
Page Down Extend	SHIFT+PAGE DOWN
Page Field	ALT+SHIFT+P
Page Up	PAGE UP
Page Up Extend	SHIFT+PAGE UP
Para Down	CTRL+DOWN
Para Down Extend	CTRL+SHIFT+DOWN
Para Up	CTRL+UP
Para Up Extend	CTRL+SHIFT+UP
Paste	CTRL+V or SHIFT+INSERT
Paste Format	CTRL+SHIFT+V
Prev Cell	SHIFT+TAB
Prev Field	SHIFT+F11 or ALT+SHIFT+F1
Prev Object	ALT+UP
Prev Window	CTRL+SHIFT+F6 or ALT+SHIFT+F6
Print	CTRL+P or CTRL+SHIFT+F12
Print Preview	CTRL+F2 or ALT+CTRL+I
Proofing	F7
Redo	ALT+SHIFT+BACKSPACE
Redo or Repeat	CTRL+Y or F4 or ALT+ENTER
Repeat Find	SHIFT+F4 or ALT+CTRL+Y
Replace	CTRL+H
Reset Char	CTRL+SPACE or CTRL+SHIFT+Z
Reset Para	CTRL+Q
Revision Marks Toggle	CTRL+SHIFT+E
Right Para	CTRL+R
Save	CTRL+S or SHIFT+F12 or ALT+SHIFT+F2
Save As	F12
Select All	CTRL+A or CTRL+CLEAR (NUM 5) or CTRL+NUM 5
Select Table	ALT+CLEAR (NUM 5)
Show All	CTRL+SHIFT+8
Show All Headings	ALT+SHIFT+A
Show Heading1	ALT+SHIFT+1
Show Heading2	ALT+SHIFT+2
Show Heading3	ALT+SHIFT+3
Show Heading4	ALT+SHIFT+4
Show Heading5	ALT+SHIFT+5
Show Heading6	ALT+SHIFT+6
Show Heading7	ALT+SHIFT+7
Show Heading8	ALT+SHIFT+8
Show Heading9	ALT+SHIFT+9
Shrink Font	CTRL+SHIFT+,
Shrink Font One Point	CTRL+[
Small Caps	CTRL+SHIFT+K
Space Para1	CTRL+1
Space Para15	CTRL+5

Space Para2	CTRL+2
Spike	CTRL+SHIFT+F3 or CTRL+F3
Start of Column	ALT+PAGE UP
Start of Column	ALT+SHIFT+PAGE UP
Start of Doc Extend	CTRL+SHIFT+HOME
Start of Document	CTRL+HOME
Start of Line	HOME
Start of Line Extend	SHIFT+HOME
Start of Row	ALT+HOME
Start of Row	ALT+SHIFT+HOME
Start of Window	ALT+CTRL+PAGE UP
Start of Window Extend	ALT+CTRL+SHIFT+PAGE UP
Style	CTRL+SHIFT+S
Subscript	CTRL+=
Superscript	CTRL+SHIFT+=
Symbol Font	CTRL+SHIFT+Q
Thesaurus	SHIFT+F7
Time Field	ALT+SHIFT+T
Toggle Field Display	SHIFT+F9
Toggle Master Subdocs	CTRL+
Tool	SHIFT+F1
Un Hang	CTRL+SHIFT+T
Un Indent	CTRL+SHIFT+M
Underline	CTRL+U or CTRL+SHIFT+U
Undo	CTRL+Z or ALT+BACKSPACE
Unlink Fields	CTRL+6 or CTRL+SHIFT+F9
Unlock Fields	CTRL+4 or CTRL+SHIFT+F11
Update Auto Format	ALT+CTRL+U
Update Fields	F9 or ALT+SHIFT+U
Update Source	CTRL+SHIFT+F7
VBCode	ALT+F11
Web Go Back	ALT+LEFT
Web Go Forward	ALT+RIGHT
Word Left	CTRL+LEFT
Word Left Extend	CTRL+SHIFT+LEFT
Word Right	CTRL+RIGHT
Word Right Extend	CTRL+SHIFT+RIGHT
Word Underline	CTRL+SHIFT+W

4.9 General definition and terminology

- **Monitor:** A device used to display information visually
- **Mouse:** A peripheral device used to point to items on a monitor
- **NIC:** Network interface card; a board inserted in a computer that provides a physical connection to a network
- **Printer:** A peripheral device that converts output from a computer into a printed image
- **Applications:** Complete, self-contained programs that perform a specific function (ie. spreadsheets, databases)
- **Bit:** A computer's most basic unit of information
- **Boot:** The process of loading or initializing an operating system on a computer; usually occurs as soon as a computer is turned on
- **Browser:** A program used to view World Wide Web pages, such as Netscape Navigator or Internet Explorer
- **Bug:** A part of a program that usually causes the computer to malfunction; often remedied in patches or updates to the program
- **Byte:** Small unit of data storage; 8 bits; usually holds one character
- **Click:** Occurs when a user presses a button on a mouse which in turn, generates a command to the computer

- **Database:** A large structured set of data; a file that contains numerous records that contain numerous fields
- **Diskette:** A small flexible disk used for storing computer data
- **Double Click:** Occurs when a user presses a button on the mouse twice in quick succession; this generates a command to the computer
- **Download:** Transferring data from another computer to your computer
- **Drag:** Occurs when a user points the mouse at an icon or folder, presses the button and without releasing the button, moves the icon or folder to another place on the computer where the button is released
- **Driver:** Software program that controls a piece of hardware or a peripheral
- **FAQ:** Frequently asked question; documents that answer questions common to a particular website or program
- **File:** Namable unit of data storage; an element of data storage; a single sequence of bytes
- **Folder:** A graphical representation used to organize a collection of computer files; as in the concept of a filing cabinet (computer's hard drive) with files (folders)
- **Freeware:** Software provided at no cost to the user
- **Gigabyte:** 1,073,741,824 bytes or 1,024 megabytes; generally abbreviated GB
- **GUI:** Graphical user interface; uses pictures and words to represent ideas, choices, functions, etc.
- **Icon:** A small picture used to represent a file or program in a GUI interface
- **Internet:** A network of computer networks encompassing the World Wide Web, FTP, telnet, and many other protocols
- **IP number:** Internet protocol; a computer's unique address or number on the Internet
- **Kilobyte:** 1,024 bytes; usually abbreviated KB
- **Megabyte:** 1,048,576 bytes or 1,024 kilobytes; enough storage to approximately equal a 600 page paperback book; generally abbreviated Mb
- **Memory:** Any device that holds computer data
- **Menu:** A list of operations available to the user of a program
- **Network:** A collection of computers that are connected
- **Peripheral:** Any of a number of hardware devices connected to a CPU
- **RAM:** Random access memory; the type of storage that changes; when the computer is turned off, the RAM memory is erased
- **ROM:** Read-only memory; the type of storage that is not changed even when the computer is turned off
- **Scroll Bar:** Allows the user to control which portion of the document is visible in the window; available either horizontally or vertically or both
- **Shareware:** Software provided at a minimal cost to users who are on their honor to send in payment to the programmer
- **Spreadsheet:** A program arranged in rows and columns that manipulates numbers
- **Tool Bar:** A graphical representation of program activities; a row of icons used to perform tasks in a program
- **URL:** Uniform resource locator; the address of a site on the World Wide Web; a standard way of locating objects on the Internet
- **Virus:** A deliberately harmful computer program designed to create annoying glitches or destroy data
- **Window:** A screen in a software program that permits the user to view several programs at one time
- **Word Processor:** A program that allows the user to create primarily text document.

- **CPU:** Central processing unit; the brain of the computer; controls the other elements of the computer
- **Disk Drive:** A peripheral device that reads and/or writes information on a disk
- **Hard Drive:** A device (usually within the computer case) that reads and writes information, including the operating system, program files, and data files
- **Keyboard:** A peripheral used to input data by pressing keys
- **Modem:** A peripheral device used to connect one computer to another over a phone line
- **Application Files :**Program files environment where you can create and edit the kind of document that application makes.
- **Click :**To select an object by pressing the mouse button when the cursor is pointing to the required menu option, icon or hypertext link.
- **Close :**To close a window that has been opened for viewing and / or editing.
- **Computer :**A general-purpose machine that processes data according to a set of instructions that are stored internally either temporarily or permanently.
- **Central Processor Unit (CPU) :**Central Processor Unit–the main chip on the computer that makes everything go.
- **Crash :**Your computer or application no longer works correctly and so you "loose" all the work you've done since the last time you saved.
- **Creating A File :**Storing data as a file with an assigned file name that is unique within the directory it resides in.
- **Delete :**To remove an item of data from a file or to remove a file from the disk.
- **Desktop :**An on-screen representation of a desktop such as used in the Macintosh and Windows operating systems.
- **Dialog Boxes :**Takes over your screen and allows you to "dialog" with the computer.
- **Directory (AKA Folder, sub-directory) :**Allows you to organize files and other folders.
- **Disk Space :**This is the place where your files live. The greater the disk space the more files you can keep. (See also Megabytes) More disk space is always better than less. You can never have much disk space.
- **Documents :**Files you create and edit.
- **Document Files :**Files we care about (memos, letters, pictures, etc.)
- **Double Click :**To press the mouse button twice in rapid succession without moving the mouse between clicks.
- **Drag :**To move an object on screen in which its complete movement is visible from starting location to destination.
- **Edit :**To make a change to existing data.
- **File Cabinet :**Metaphorically, the hard drive (and other kinds of storage media like floppy disks) which store files and folders.
- **Folder (AKA Directory, Sub-Directory) :**Allows you to organize files and other folders.
- **Folder Icons :**Collections of documents and other folders.
- **Icons :**In a graphical user interface (GUI), a small, pictorial, on screen representation of an object, such as a document, program, folder or disk drive.
- **Icon View :**Allows you to see icons of folders and files primarily as icons with little information.
- **Keyboard :**This if the primary text input device. It also contains certain standard function keys, such as the Escape key, tab, and arrow keys, shift and control keys, and sometimes other manufacturer-customized keys.

- **Kilo (K) :**This is a unit of measure = 1,000. So 1,000 bytes is a KiloByte.
- **List View :**Shows the icons but also orders the icons (often by name, but can sort the list in other ways) and shows more information about them.
- **Macintosh :**The brand name of a family of personal computers (hardware) and an operating system (software) from Apple, introduced in 1984.
- **Megabytes (Mb) :**Mega = million so Mb is 1,000,000 bytes. It's enough information for the computer to store one character (e.g. "h"), so 1mb text file = 1,000,000 keystrokes in that file. Just to confound the masses, although RAM and Disk Space do something completely different we measure both in megabytes. This leads to confusion.
- **Menu :**Displays a list of commands, some with images next to them.
- **Modifier Keys :**Keys that change the meaning of what you type.
- **Mouse :**Pointing device that allows you to tell the computer what to do.
- **Operating System (OS) :**System software that allows your computer to work.
- **Pointer (AKA Cursor) :**The name of the arrow (or other shape) that tracks across the screen as you move the mouse (or other pointing device) around.
- **Random Access Memory (RAM) :**This stands for Random Access Memory. You can think of this as the "space" where you computer does its processing. The more space you have the more processes you can run at the same time. More RAM is always better than less. You can never have much RAM.
- **Recycle Bin :**Place where you put files and folders that you may later want to delete or get rid of. Compare Trash.
- **Resize Box :**Allows you to change the size and shape of a window.
- **Right click :**To press the right button on the mouse. (This is Windows specific. On a Mac running System 8 or higher, you hold down the Control key and then click to get the same effect.)
- **Save :**Tell the computer to create a file on disk that has the information you've put into the document (usually typing).
- **Save As :**Give the file a name and/or store the file in a certain place.
- **Scroll bar :**Allows you to move around through your document.
- **Shut down :**To quit all applications and turn off the computer.
- **Software :**Instructions that tell the computer what to do.
- **System files :**Allows our computer to work.
- **Trash :**Place where you put files and folders that you want to delete or get rid of.
- **Volume Icons :**Devices that hold files and folders.
- **Windows :**1) The most widely used operating system for personal computers from Microsoft. (Software only. Other companies manufacture the hardware that runs the Windows Operating System.) Compare Macintosh. (Windows with a large "W".)
- **Hardware port:**any place on the computer where devices can be plugged in
- **USB:**type of computer port used for keyboards, drives, mouse, etc.
- **CD drive:**a piece of hardware that reads CDs
- **Hardware:**physical parts of the computer and devices used with a computer
- **Software:**computer programs
- **Operating system:**software that communicated with hardware enabling other software to run (examples: Windows, Mac OS, and Linux)
- **Icon:**a visual representation of files and programs on the computer

- **Shortcut:**uses an icon like a button to go directly to a file or program
- **Folder:**store files just like real folders
- **File:**a collection of data stored in one unit, identified by a filename(examples: document, pictures, videos, etc.)
- **Window:**an area on the screen that displays information for a specific program
- **Dialog box:**a window that pops up with options for the user to select
- **Toolbar:**a set of icons or buttons that is part of the software being used

4.10 Input-Output Devices

4.11 Data communication ports

4.12 Short forms for computer and internet terminology

AAL	ATM Adaptation Layer
AARP	AppleTalk Address Resolution Protocol
ABM	Asynchronous Balance Mode (HDLC)
ABR	Available Bit Rate
AC	Access Control (IEEE)
ACF	Access Control Field (DQDB)
ACK	Acknowledgment
ADM	Add/Drop Multiplexer
ADSL	Asymmetric Digital Subscriber Links
AIS	Alarm Indication Signal (SONET)
PC	Personal computer
COMPUTER	Commonly operating machine particularly used for technology entertainment and research
HTML	Hyper text markup language
AJAX	Asynchronous javascript and xml
ORACLE	Oak ridge automatic computer and logical engine
RDBMS	Relational database management system
SQL	Structured query language
XML	Extensible markup language
PERL	Practical extraction and report language
PHP	Hypertext preprocessor
ASP	Active server pages
API	Application programming interfaces
XHTML	Extensible hypertext markup language
CSS	Cascading style sheets
ASCII	American standard code for information interchange
XSL	Extensible style sheet language
J2EE-	Java 2 platform enterprise edition
JSP-	Java server page
VBS	Visual basic scripting language
JS	Java script
3GP	3rd generation protocol
3GPP	3rd generation partnership project
AAC	Advanced audio codec
AC3	Dolby digital sound file
AIFF	Audio interchange file format
AMR	Adoptive multi rate
AWB	Adoptive multi rate wideband
AVI	Audio video interleaved
CDA	Compact disk audio
DLL	Dynamik link library
DVD	Digital video disk

EXE	Executable format
FLAC	Free lossless audio codec
FLV	Flash live video
JPEG	Joint photographic expert group
BMP	Bitmap
GIF	Graphics interchange format
JAD	Java application development
JAR	Java archive
MIDI	Musical instrument digital interface
MMF	Music Mobile Format
MP2	Mpeg audio layer 2
MP3	Mpeg audio layer 3
MP4	Mpeg layer 4
MPEG	Motion picture experts group
PDF	Portable document format
PNG	Portable network/new graphics
RM	Real media
SIS	Symbian installation source
SWF-	Shock wave flash
ZIP	Zone improvement plan
VCD	Video compact disk
VOB	Video object
WAV	Waveform pcm audio
WMA	Windows media audio
PDF	Portable document format
M3G	Mobile 3d graphics
M4A	Mpeg-4 audio file
MMF	Synthetic music mobile application file
XMF	Extensible music file
WBMP	Wireless bitmap image
DVX	Divx video
WML	Wireless markup language
CD	Compact disk.
DVD	Digital versatile disk.
CRT	Cathode ray tube.
DAT	Digital audio tape.
DOS	Disk operating system.
GUI	Graphical user interface.
HTTP	Hyper text transfer protocol.
HTTPS	Hyper text transfer protocol secure
. IP	Internet protocol.
ISP	Internet service provider.
TCP	Transmission control protocol.
UPS	Uninterruptible power supply.
VHF	Very high frequency.
UHF	Ultra high frequency.
ALU	Arithmetic logic unit
URL	Uniform resource locator.
WINDOWS	Wide interactive network for development of office work solution
AMD	Advance micro device
ASPI	Advacne scsi programming interface
ASIC	Application specific integrated circuit
EPROM	Erasable programmable read only memory.
FPS	Frame per second
USB	Universal serial bus.
VIRUS	Vital information resource under seized.
RAM	Random access memory
ROM	Read only memory
MIME	Multipurpose internet mail extensions
SMTP	Simple mail transfer protocol
IMAP	Internet message access protocol

HSDPA	High speed downlink packet access.
EDGE	Enhanced data rate for gsm evolution.
GPRS	General packet radio service.
3G	3rd generation.
GSM	Global system for mobile communication.
CDMA	Code division multiple access.
UMTS	Universal mobile telecommunication system.
ARPANET	Advanced research project agency network.
AM/FM	Amplitude/ frequency modulation.
WLAN	Wireless local area network
CPU	Central processing unit
RAM	random access memory
ROM	read only memory
PROM	Programmable Read Only Memory
HDD	Hard Disk Drive
FDD	Floppy Disk Drive
KBD	KeyBoard
I/O	Input & Output
CD	Compact Disk
DVD	Digital Video Disk
SMPS	Switch Mode Power Supply
POST	Power ON Self Test
BIOS	Basic Input Output System
VDU	Visible Display Unit
LED	Light Embedded Diode
LCD	Liquid Crystal Display
USB	Universal Serial Bus
VGA	Video/Visual Graphic Adapter
LAN	Local Area Network
WAN	Wide Area Network
MAN	Metropolitan Area Network
HLL	High Level Language
LLL	Low Level Language
MIPS	Million of Instruction Per Second
Mbps	Mega Bytes Per second
Kbps	Kilo Bytes per second
CMD	Command
KB	Kilobyte
MB	Mega byte
GB	Giga byte
GiB	Gibi byte
TB	Tera byte
TiB	Tebi byte
PB	Peta byte
PiB	Pebi byte
EB	Exa byte
ATA	Advanced Technology Attachment
ASCII	American Standard Code for Information Interchange
ARPANET	Advanced Research Projects Agency Network
Ajax	Asynchronous JavaScript and XML
ASP	Active Server Pages/Application Service Provider
API	Application Programming Interface
ATA	Advanced Technology Attachment
ATM	Asynchronous Transfer Mode
BiDi	Bi-Directional
bin	binary
BAL	Basic Assembly Language
BASIC	Beginner's All-Purpose Symbolic Instruction Code
BIOS	Basic Input Output System
bps	bits per second
BCD	Binary Coded Decimal

Blog	Web Log
BMP	Basic Multilingual Plane
BT	BitTorrent / Bluetooth
BW	Bandwidth
CAD	Computer-Aided Design
CPU	Central Processing Unit
CIM	Common Information Model
CRS	Computer Reservations System
CRT	Cathode Ray Tube
CLI	Command Line Interface
CDMA	Code Division Multiple Access
CMOS	Complementary Metal-Oxide Semiconductor
CSI	Common System Interface
CD-R	CD-Recordable
CD-ROM	CD Read-Only Memory
CD-RW	CD-Rewritable
CMOS	Complementary Metal-Oxide Semiconductor
CSV	Comma-Separated Values
COBOL	Common Business-Oriented Language
CGI	Common Gateway Interface /Computer-Generated Imagery
DAO	Data Access Objects
DHTML	Dynamic Hypertext Markup Language
DAT	Digital Audio Tape
DB	Database
DIVX	Digital Video Express
DVD	Digital Video Disc
DVD-R	DVD-Recordable
DVD-ROM	DVD-Read Only Memory
DVD-RW	DVD-Rewritable
DOS	Disk Operating System
DDR	Double Data Rate
DNS	Domain Name System
EEPROM	Electronically Erasable Programmable Read-Only Memory
ENIAC	Electronic Numerical Integrator And Computer
EBCDIC	Extended Binary Coded Decimal Interchange Code
EPROM	Erasable Programmable Read-Only Memory
ESD	Electrostatic Discharge
FAT	File Allocation Table
FAQ	Frequently Asked Questions
FDD	Floppy Disk Drive
FDMA	Frequency-Division Multiple Access.
FS	File System
FSB	Front Side Bus
FTP	File Transfer Protocol
Gb	Gigabit / GB&Gigabyte
GIF	Graphics Interchange Format
GPL	General Public License
GPRS	General Packet Radio Service
HD	High Density
HDD	Hard Disk Drive
HD DVD	High Definition DVD
HP	Hewlett-Packard
HT	Hyper Threading
HTM	Hierarchical Temporal Memory
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
Hz	Hertz
IBM	International Business Machines.
IC	Integrated Circuit
ICMP	Internet Control Message Protocol
ICT	Information and Communication Technology

IDE	Integrated Development Environment /Integrated Drive Electronics
IE	Internet Explorer
IIS	Internet Information Services
IM	Instant Messaging
IMAP	Internet Message Access Protocol
I/O	Input/Output
IP	Intellectual Property /Internet Protocol
IrDA	Infrared Data Association
ISA	Industry Standard Architecture /Instruction Set Architecture
iSCSI	Internet Small Computer System Interface
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
IT	Information Technology
J2EE	Java 2 Enterprise Edition
J2ME	Java 2 Micro Edition
J2SE	Java 2 Standard Edition
JDK	Java Development Kit
JPEG	Joint Photographic Experts Group
JRE	Java Runtime Environment
JS	JavaScript
KB	Keyboard /Kilobyte /Knowledge Base
Kb	Kilobit
kHz	Kilohertz
KVM	Keyboard, Video, Mouse
LED	Light-Emitting Diode
MAN	Metropolitan Area Network
Mb	Megabit
MB	Megabyte
MBR	Master Boot Record
MDI	Multiple Document Interface
MHz	Megahertz
MIDI	Musical Instrument Digital Interface
MMU	Memory Management Unit
MMX	Multi-Media Extensions
MNG	Multiple-image Network Graphics
MPEG	Motion Pictures Experts Group
MOSFET	Metal-Oxide Semiconductor Field Effect Transistor
MPEG	Motion Pictures Experts Group
MS	Microsoft
MS-DOS	Microsoft DOS
NIC	Network Interface Controller
NTFS	NT Filesystem
NVRAM	Non-Volatile Random Access Memory
OO	Object-Oriented
OS	Open Source /Operating System
P2P	Peer-To-Peer
PAN	Personal Area Network
PATA	Parallel ATA
PC	Personal Computer
PCB	Printed Circuit Board
PC DOS	Personal Computer Disk Operating System
PCI	Peripheral Component Interconnect
PCIe	PCI Express
PERL	Practical Extraction and Reporting Language
PGA	Pin Grid Array
PHP	PHP: Hypertext Preprocessor
PIC	Peripheral Interface Controller /Programmable Interrupt Controller
PLC	Power Line Communication /Programmable Logic Controller
POST	Power-On Self Test
PPI	Pixels Per Inch
PS/2	Personal System/2

PSU	Power Supply Unit
RAD	Rapid Application Development
RAM	Random Access Memory
RAID	Redundant Array of Inexpensive Disks
RAIT	Redundant Array of Inexpensive Tapes
RF	Radio Frequency
RGB	Red, Green, Blue (RGBA&Red, Green, Blue, Alpha)
RIP	Raster Image Processor /Routing Information Protocol
ROM	Read Only Memory
ROM-DOS	Read Only Memory - Disk Operating System
SATA	Serial ATA
SCSI	Small Computer System Interface
SDRAM	Synchronous Dynamic Random Access Memory
SFTP	Secure FTP /Simple File Transfer Protocol
SHDSL	Single-pair High-speed Digital Subscriber Line
SIMD	Single Instruction, Multiple Data
SIMM	Single Inline Memory Module
SPI	Serial Peripheral Interface
SPI	Stateful Packet Inspection
SVG	Scalable Vector Graphics
SVGA	Super Video Graphics Array
TB	TeraByte
TCP/IP	Transmission Control Protocol/Internet Protocol
TDMA	Time Division Multiple Access
tmp	temporary
TTF	TrueType Font
TTL	Transistor-Transistor Logic
UPS	Uninterruptible Power Supply
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
USB	Universal Serial Bus
UTF	Unicode Transformation Format
UTP	Unshielded Twisted Pair
VB	Visual Basic
VBA	Visual Basic for Applications
VBS	Visual Basic Script
VPN	Virtual Private Network
VPU	Visual Processing Unit
WAN	Wide Area Network
WAP	Wireless Access Point /Wireless Application Protocol
Wi-Fi	Wireless Fidelity
WLAN	Wireless Local Area Network
WMA	Windows Media Audio
WMV	Windows Media Video
WPAN	Wireless Personal Area Network
XML	eXtensible Markup Language
Y2K	Year Two Thousand
EiB	Exbi byte
ZB	Zetta byte
ZiB	Zebi byte
YB	Yotta byte
YiB	Yobi byte
LCD	Liquid crystal display
LED	Light-emitting diode
NTFS	New technology file system
FAT	File allocation table
DOC	Document
TXT	Text
SD	Secure digital
USB	Universal serial bus
IT	Information technology

NET	Internet
IP	Internet protocol
AP	Access point
DNS	Domain name system
HTTP	Hypertext transfer protocol
HTTPS	Hypertext transfer protocol secure
HTML	Hypertext markup language
PHP	Hypertext preprocessor
XML	Extensible markup language
CSS	Cascading style sheets
ASP	Active server pages
SQL	Structured query language
RSS	Really simple syndication
DMCA	Digital millennium copyright act
IPV4	Internet protocol version 4
IPV6	Internet protocol version 6
VOIP	Voice over internet protocol
FAQ	Frequently asked questions
SEO	Search engine optimization
1024 Bytes	1 Kilo Byte (KB)
1024 KB	1 Mega Byte (MB)
1024 MB	1 Gyga Byte (GB)
1024 GB	1 Tera Byte (TB)
1024 TB	1 Peta Byte (PB)
1024 PB	1 Exa Byte (EB)
1024 EB	1 Zetta Byte (ZB)
1024 ZB	1 Yotta Byte (YB)
ANI	Automatic Number Identification
ANS	American National Standards
ANSI	American National Standards Institute
API	Application Programming Interface
APS	Automatic Protection Switching
ARM	Asynchronous Response Mode (HDLC)
ARP	Address Resolution Protocol
Async	Asynchronous
ATM	Asynchronous Transfer Mode
AU	Access Unit (DQDB)
AUI	Attachment Unit Interface (Ethernet 802.3)
B8ZS	Bipolar with 8 Zero Substitution
BCC	Block Check Characters
BCD	Binary Coded Decimal
BECN	Backward Explicit Congestion Notification (FR)
Bellcore	Bell Communications Research
BER	Bit Error Ratio or Rate
BGP	Border Gateway Protocol
BIP	Bit Interleaved Parity (8)
B-ISDN	Broadband Integrated Services Digital Network
B-NT	Broadband Network Terminator
BO	Bit Oriented (SONET)
BOC	Bell Operating Company
BOM	Beginning of Message (DQDB)
BootP	Bootstrap Protocol
bps	Bits per second or bytes per second
BRI	Basic Rate Interface (ISDN)
BSC	IBMs Binary Synchronous Communications protocol
B-TA	Broadband Terminal Adapter (ATM)
B-TE	Broadband Terminal Equipment (ATM)
CAD/CAM	Computer Aided Design/Computer Aided Manufacturing
CAN	Customer Access Node (SMDS)
CBDS	Connectionless Broadband Data Service
CBEMA	Computer and Business Equipment Manufacturers Association

CBR	Constant Bit Rate
CCI	Carrier-to-Carrier Interface
CCITT	Consultative Committee International Telegraph & Telephone
CD	CountDown counter (DQDB)
CE	Connection Endpoint
CEPT	Conference on European Post & Telegraph
CIR	Committed Information Rate (FR)
CL	Connectionless (SONET)
CLEC	Competitive Local Exchange Carrier
CLLM	Consolidated Link Layer Management (FR)
CLNP	Connectionless Layer Network Protocol
CLNS	ConnectionLess Network Service (OSI)
CLSF	ConnectionLess Server Function (ITU-T)
CMIP	Common Management Interface Protocol (ISO)
CMIS	Common Management Information Service (ISO)
CMISE	CMIS Element (ISO)
CMT	Connection Management (FDDI)
CNMS	Customer Network Management System
CO	Central Office
COAM	Customer Owned and Maintained
COCF	Connection-Oriented Convergence Function (DQDB)
COM	Continuation of Message (DQDB)
CONS	Connection-Oriented Network Service (ITU-T)
CPE	Customer Premises Equipment
C/R	Command/Response Indicator or bit
CRC	Cyclic Redundancy Check or Test
CS	Convergence Sublayer (DQDB)
CSMA/CD	Carrier-Sense Multiple Access with Collision Detection
CSU	Channel Service Unit
CTI	Computer-to-telephony interface
DA	Destination Address field
DAL	Dedicated Access Line
DARPA	Defense Advanced Research Program Agency
DARPAnet	Defense Advanced Research Program Agency network
DAS	Dual-Attach Station connection (FDDI)
DCE	Data Communications Equipment
DCS	Digital Cross-connect System
DDD	Direct Distance Dialing
DDS	Digital Data Service
DE	Discard Eligibility (FR)
DEC	Digital Equipment Corporation
DH	DMPDU Header (DQDB)
DHCP	Dynamic Host Configuration Protocol
DLCI	Data Link Connection Identifier (FR)
DMPDU	Derived MAC PDU (DQDB)
DNIS	Directory Number Information Service
DNS	Distributed Naming Service
DPG	Dedicated Packet Group (FDDI)
DoD	Department of Defense
DQDB	Distributed Queue Dual Bus (IEEE)
DS0	Digital Signal Level 0
DS1	Digital Signal Level 1
DS3	Digital Signal Level 3
DSAP	Destination Service Access Point (LLC)
DSG	Default Slot Generator (DQDB)
DSP	Digital Signal Processor
DSU	Data Service Unit
DT	DMPDU trailer (DQDB)
DTE	Data Terminal Equipment
DTMF	Dual Tone MultiFrequency
DVMRP	Distance Vector MulticaRouting Protocol

DXC	Digital Cross-Connect
DXI	Data Exchange Interface (SMDS, ATM)
E1	European Transmission Level 1
E3	European Transmission Level 3
EA	Extended Address
ECN	Explicit Congestion Notification (FR)
ECSA	Exchange Carriers Standards Association
ED	End Delimiter (IEEE 802)
EDI	Electronic Data Interchange (or document interchange)
EGP	Exterior Gateway Protocol
EGRP	Exterior Gateway Routing Protocol
EIA	Electronics Industries Association
EIGRP	Enhanced Interior Gateway Routing Protocol
EIR	Excess Information Rate
EMA	Enterprise Management Architecture (DEC)
EOM	End Of Message
EOT	End Of Transmission
ES	End System (OSI)
ESF	Extended SuperFrame
ES-IS	End System-to-Intermediate System protocol (OSI)
ETB	End of Transmission Block
ETSI	European Telecommunications Standards Institute
ETX	End of Text
F	Flag
FC	Frame Control field (FDDI)
FCS	Frame Check Sequence (FR)
FDDI	Fiber Distributed Data Interface (ANSI)
FDDI-II	Fiber Distributed Data Interface Version II
FDM	Frequency Division Multiplexing
FEBE	Far End Block Error
FEC	Forward Error Correction
FECN	Forward Explicit Congestion Notification (FR)
FERF	Far End Reporting Failure
FIFO	First In, First Out
FM	Frequency Modulation
FOIRL	Fiber-Optic InterRepeater Link (Ethernet 802.3)
fps	Frames per second
FR	Frame Relay
FRAD	Frame Relay Assembler/Disassembler, or Access Device
FS	Frame Status field (FDDI)
FT1	Fractional T1
FTP	File Transfer Protocol
Gbit	Gigabits (billions of bits)
Gbps	Gigabits per second (109 bps)
GFC	Generic Flow Control
GFID	General Format Identifier
GFI	General Format Identifier (X.25)
GGP	Gateway-Gateway Protocol (DoD)
GOS	Grade of Service
GOSIP	Government Open System Interconnection Profile
GUI	Graphical User Interface
HCS	Header Check Sequence (DQDB)
HDTV	High Definition TeleVision
HDLC	High-Level Data Link Control (ISO)
HEC	Header Error Control
HOB	Head of Bus (DQDB) A or B
HSRP	Hot Standby Routing Protocol
HSSI	High-Speed Serial Interface
HTML	Hypertext Markup Language
HTTP	Hypertext Trasfer Protocol
Hz	Hertz or cycles per second

ICF	Isochronous Convergence Function (DQDB)
ICIP	Inter-Carrier Interface Protocol (SMDS)
ICMP	Internet Control Message Protocol
IDRP	InterDomain Routing Protocol
IEC	InterExchange Carrier
IEEE	Institute of Electrical and Electronics Engineers
IETF	Internet Engineering Task Force
IGP	Interior Gateway Protocol
IGP	Interior Gateway Routing Protocol
IGRP	Interior Gateway Routing Protocol (CiscoS)
ILMI	Interim Local Management Interface
IMPDU	Initial MAC Protocol Data Unit (DQDB)
IMSSI	Inter-MAN Switching System Interface (DQDB)
I-MAC	Isochronous Media Access Control (FDDI)
intraLATA	intraLocal Access Transport Area
ISN	Initial Sequence Number (DoD)
IP	Internet Protocol (DoD)
IPCP	Internet Protocol Control Protocol (DoD)
IPX	Internetwork Packet Exchange protocol (Novell)
IS	Intermediate System (OSI)
ISDN	Integrated Services Digital Network
ISDU	Isochronous Service Data Unit (DQDB)
IS-IS	Intermediate System-to-Intermediate System (OSI)
ISO	International Standards Organization
ISP	Internet Service Protocol
ISSI	Inter-Switching System Interface (SMDS)
ISU	Isochronous Service User (SMDS)
IT	Integrated Technology
ITU	International Telecommunications Union
IVR	Integrated Voice Recognition
IXC	IntereXchange Carrier
kbit	kilobit (thousands of bits)
kbps	kilobits per second (103 bps)
km	kilometers (103 meters)
LAN	Local Area Network
LANE	LAN Emulation
LAP-B	Link Access Procedure - Balanced (X.25)
LAP-D	Link Access Procedure - D Channel (ISDN/Frame Relay)
LAP-F	Link Access Procedure - Frame Mode
LAT	Local Area Transport protocol (DEC)
LATA	Local Access Transport Area
LB	Letter Ballot
LCD	Liquid Crystal Display
LCGN	Logical Channel Group Number
LCP	Link Control Protocol
LEC	Local Exchange Carrier
LECS	LAN Emulation Configuration Server
LES	LAN Emulation Server
LLC	Logical Link Control (IEEE 802.X)
LME	Layer Management Entity (DQDB)
LMI	Local Management Interface (FR)
LSB	Least Significant Bit
LT	Line Termination
LTE	Line Terminating Equipment (SONET)
LU	Logical Unit (SNA)
m	meter
MAC	Media Access Control (IEEE 802.X)
MAN	Metropolitan Area Network (DQDB, FDDI)
Mbit	Megabits (millions of bits)
Mbps	Megabits per second (106 bps)
MCF	MAC Convergence Function (DQDB)

MCP	MAC Convergence Protocol (DQDB)
MHz	Megahertz
MIB	Management Information Base (SNMP)
MIC	Media Interface Connector (FDDI)
MID	Message IDentifier (DQDB), Multiplexing IDentifier (ATM)
MIPS	Millions of Instructions Per Second
MMF	Multimode Fiber
MOP	Maintenance and Operation Protocol (DEC)
MOSPF	Multicast Open Shortest Path First
MPEG	Motion Picture Encoding Group
MPOA	MultiprotocolOver ATM
ms	millisecond (one-thousandth of a second, 10-3 seconds)
ms	microsecond (10-6 second)
MSAP	MAC Service Access Point (SMDS)
MSB	Most Significant Bit
MSDU	MAC Service Data Unit (SMDS)
MSS	MAN Switching System (SMDS)
MTU	Maximum Transmission Unit
MUX	Multiplexer
NANP	North American Numbering Plan
NBP	Name Binding Protocol
NCP	Network Control Protocol or Point (SNA)
NE	Network Element
NetBIOS	Network Basic Input/Output System protocol
NFS	Network File Server
nm	nanometer (10-9 meter)
NIC	Network Interface Card
NMP	Network Management Process (SMDS)
NMS	Network Management System or Station
NNI	Network-Node Interface (SONET)
NNI	Network-to-Network Interface (FR)
NOS	Network Operating System
NP	Network Performance
NPA	Numbering Plan Area
NRM	Normalized Response Mode (ISO)
NRZ	Non-return to zero
NRZI	Non-return to zero invert ones
ns	nanosecond (10-9 second)
OS	Operating System
OSI	Open Systems Interconnection
OSI CLNS	Connectionless Network System (OSI)
OSIRM OSI	Reference Model
OSPF	Open Shortest Path First
OTC	Operating Telephone Company
PA	Prearbitrated segment or slot (DQDB)
PABX	Private Automatic Branch Exchange
PAD	Packet Assembler/Disassembler (X.25)
PAF	Prearbitrated Function (DQDB)
PBX	Private Branch Exchange
PCN	Personal Communications Network
PCR	Peak Cell Rate
PCS	Personal Communications Services
PDC	Packet Data Channel (FDDI)
PDH	Plesiochronous Digital Hierarchy
PDN	Public Data Network
PDS	Packet Driver Specification for public domain
PDU	Protocol Data Unit (IEEE)
Ph-SAP	Physical layer SAP (DQDB)
PHY	Physical layer standard (FDDI)
PID	Protocol IDentification
PIM	Protocol Independent Multicast

Ping	Packet Internet Groper
PIR	Protocol Independent Routing
PL PAD	Length (DQDB)
PLCP	Physical Layer Convergence Protocol (DQDB)
PM	Performance Monitoring
PMD	Physical Layer Medium Dependent standard (FDDI)
POH	Path Overhead (SONET)
POI	Path Overhead Identifier (DQDB)
PON	Passive Optical Network
PoP	Point of Presence
POTS	Plain Old Telephone Service
PPP	Point-to-Point Protocol (Internet)
Pps	Packets per second
PRI	Primary Rate Interface (ISDN)
PSPDN	Packet-Switched Public Data Network
PT	Payload Type
PTE	Path-Terminating Equipment (PTE)
PTT	Postal, Telegraph & Telephone Ministry/Administration
PU	Physical Unit (SNA)
PVC	Permanent Virtual Circuit or Channel (FR, X.25)
QA	Queued Arbitrated (DQDB) segment, slot, access function
QAF	Queued Arbitrated Function (DQDB)
QoS	Quality of Service
QPSX	Queued Packet and Synchronous Exchange
RBOC	Regional Bell Operating Company
RCP	Remote Console Protocol (DEC)
RDI	Remote Defect Indication (ATM)
REJ	Reject frame
RFC	Request for Comments
RIP	Routing Information Protocol
RISC	Reduced Instruction Set Computer
RJE	Remote Job Entry
RMT	Ring Management (FDDI)
RNR	Receive Not Ready
RQ	Request Counter (DQDB)
RR	Receive Ready frame
RSVP	Resource Reservation Protocol
RTMP	Routing and Management Protocol (Apple)
RTP	Routing Update Protocol
s	second
SA	Source Address field
SAP	Service Access Point (ISO)
SAPI	Service Access Point Identifier (ISO)
SAR	Segmentation and Re-assembly (ATM)
SAS	Single-Attach Station connection (FDDI)
SD	Start Delimiter
SDH	Synchronous Digital Hierarchy (ITU-T)
SDLC	Synchronous Data Link Control protocol (IBM)
SDU	Service Data Unit (DQDB)
SES	Severely Errored Seconds
SF	SuperFrame
SIG	SMDS Interest Group
SIP	SMDS Interface Protocol (SMDS)
SIR	Sustained Information Rate (SMDS)
SMDS	Switched Multimegabit Data Service
SMF	Single-Mode Fiber
SMT	System Management protocol (FDDI)
SMTP	Simple Mail Transfer Protocol
SN	Sequence Number
SNA	System Network Architecture (IBM)
SNAP	SubNetwork Access Protocol (SMDS)

SNI	Subscriber Network Interface (SMDS)
SNMP	Simple Network Management Protocol (DoD)
SOH	Section Overhead
SONET	Synchronous Optical Network (ANSI)
SPE	Synchronous Payload Envelope (SONET)
SPF	Shortest Path First protocol
SPM	FDDI-to-SONET Physical Layer Mapping standard
SQL	Structured Query Language
SREJ	Select Reject frame
SRT	Source Route Transparent protocol
SS	Switching System (SMDS)
SSAP	Source Service Access Point (LLC)
SSCOP	Service-Specific Connection Oriented Protocol (ATM)
SSCS	Service-Specific Convergence Sublayer (ATM)
STE	Section Terminating Equipment (SONET)
STM	Synchronous Transfer Mode or Station Management (SDH)
STM-n	Synchronous Transport Module level n (SDH)
STP	Shielded Twisted Pair
STP	Spanning Tree Protocol (IEEE 802.1d)
STS-n	Synchronous Transport Signal Level n (SONET)
STS-Nc	Concatenated Synchronous Transport Signal Level N
SVC	Switched Virtual Circuit or Signaling Virtual Channel
SYN	Synchronous Idle
t	time
TA	Terminal Adapter
TAPI	Telephony Application Program Interface
TC	Transmission Convergence sub-layer of PHY layer (ATM)
TCP	Transmission Control Protocol (DoD)
TCP/IP	Transmission Control Protocol/Internet Protocol (DoD)
TDM	Time Division Multiplexing
TDMA	Time Division Multiple Access
TE	Terminal Equipment
TP	Transport Protocol (CCITT)
TP4	Transport Protocol Class 4 (ISO)
TR	Technical Report
TSAPI	Telephony Services Application Programmers Interface
UBR	Unspecified Bit Rate
UDP	User Datagram Protocol (DoD)
UNI	User-to-Network Interface
UNMA	Unified Network Management Architecture (AT&T)
UTP	Unshielded Twisted Pair
VBR	Variable Bit Rate
VC	Virtual Channel or Virtual Call
VCC	Virtual Channel Connection
VCI	Virtual Channel or Circuit Identifier (DQDB)
VC-n	Virtual Container-n (SDH)
VLSI	Very Large Scale Integration
VP	Virtual Path (ATM)
VPI	Virtual Path Identifier (ATM)
VPN	Virtual Private Network
VT	Virtual Tributary (SONET)
VTx VT	of size x (currently x = 1.5, 2, 3, 6)
VTx-Nc	Concatenated Virtual Tributary (SONET)
WAN	Wide Area Network
XNS	Xerox Network Systems protocol (XEROX)
ZIP	Routing and Management protocol (Apple)

4.13 Internet and email

1. The two parts of a computer are
   - (A) Zip Drive and CD.
   - (B) Monitor and Keyboard
   - (C) Hardware and Software
   - (D) Bus and Power

2. The Central Processor Unit (CPU) is a
   - (A) Place where your files live.
   - (B) Main chip on the computer that makes everything go.
   - (C) Space where your computer does its processing.
   - (D) Disk Drive

3. What does RAM stand for?
   - (A) Random acess memory
   - (B) Read acess memory
   - (C) Random auxilary memory
   - (D) Random AntiMemory

4. A normal CD-ROM usually can store up to ..... data?
   - (A) 680 KB
   - (B) 680 Bytes
   - (C) 680 MB
   - (D) 680 GB

5. Which of the following required large computer memory?
   - (A) Imaging
   - (B) Graphics
   - (C) Voice
   - (D) All of above

6. Offline device is
   - (A) A device which is not connected to CPU
   - (B) A device which is connected to CPU
   - (C) A direct access storage device
   - (D) An I/O device

7. Which of the following programming language started from second generation?
   - (A) LISP
   - (B) C
   - (C) QBASIC

(D) FORTRAN

8. Which one of the following input device is user-programmable?
   (A) Dumb terminal
   (B) Smart terminal
   (C) VDT
   (D) Intelligent terminal

9. Which is not consisted in a processor
   (A) ALU
   (B) CU
   (C) Memory
   (D) Registers

10. IBM 1401 is the first computer to enter in Nepal. It belonged to
    (A) First Generation
    (B) Second Generation
    (C) Third Generation
    (D) Fourth Generation

11. The Third Generation Computer was made with.....
    (A) Vacuum Tube
    (B) Discrete Components
    (C) IC
    (D) Bio Chips

12. Which of the following are the two main components of the CPU?
    (A) Control Unit and Registers
    (B) Registers and Main Memory
    (C) Control unit and ALU
    (D) ALU and bus

13. Disk space is the
    (A) Place where the computer does the processing.
    (B) Box that holds the guts of the computer.
    (C) Place where your files live.
    (D) Main memory of computer

14. A Mega =

(A) 1 Million
(B) 10 Million
(C) 100 Thousand
(D) 1000 Thousand

15. A byte stores enough information for one
(A) File
(B) Keystroke (e.g.:'d')
(C) Word (e.g."boy")
(D) Movie

16. If you had a 1 Mb text file, how many keystrokes would you have?
(A) It depends on how many words you have.
(B) 1 Million
(C) 10 Million
(D) 1000 Million

17. What else do we measure in Megabytes (MB)?
(A) RAM
(B) Disk Space
(C) Both Disk Space and RAM
(D) Only RAM

18. Megahertz (MHz) measures
(A) Sound
(B) Speed
(C) Space
(D) None

19. UNIVAC is
(A) Universal Automatic Computer
(B) Universal Array Computer
(C) Unique Automatic Computer
(D) Unvalued Automatic Computer

20. The basic operations performed by a computer are
(A) Arithmetic operation
(B) Logical operation
(C) Storage and relative
(D) All the above

21. C.D- R.O.M. is a
    - (A) Random Access Memory
    - (B) Volatile memory
    - (C) Optical memory
    - (D) None of the above

22. Laser Printer uses
    - (A) Raster Scan
    - (B) Camera Lanes
    - (C) Heat Sensitive paper
    - (D) None of the above

23. Bandwidth is maximum, along the following communication channel.
    - (A) Twisted pairs
    - (B) Optical fiber
    - (C) Co-axial cable
    - (D) Infrared

24. EBCDIC code developed by
    - (A) ANSI
    - (B) IBM
    - (C) SILICA
    - (D) Plastic

25. CPU chip is made of
    - (A) Carbon
    - (B) Copper
    - (C) flexible stack
    - (D) None of the above

26. Winchester disk means
    - (A) Disk stack
    - (B) Removable disk
    - (C) Flexible stack
    - (D) None of the above

27. A CPU's processing power is measured in
    - (A) IPS
    - (B) CIPS
    - (C) MIPS

(D) KIPS

28. One Kilobyte means
    (A) 2^2 Bytes
    (B) 2^{10} Bytes
    (C) 2^{100} Bytes
    (D) None of the above

29. A billionth of a second is defined as
    (A) Mill Second
    (B) Micro second
    (C) Nano second
    (D) Pico second

30. A computer system that combines text, graphics, voice and video is known as
    (A) Multi user system
    (B) Multitasking system
    (C) Multimedia
    (D) None of the above

31. The range of frequencies available for data transmission is known as
    (A) PCI
    (B) Multitasking system
    (C) Simulation
    (D) None of the above

32. WAN Hardware does not include
    (A) Multiplexer
    (B) Router
    (C) Bridge
    (D) None of these

33. RAM chip was invented by
    (A) Intel
    (B) Motorola
    (C) IBM
    (D) None of these

34. What is diameter of CD-ROM

(A) 12 Cm
(B) 12 inch
(C) 12 mm
(D) None of the above

35. Internet addresses are assigned by
(A) TETF
(B) IEEE
(C) INTERNIC
(D) None of the above

36. AMD's full name is
(A) Automated Micro Device
(B) Advanced Micro Device
(C) Arithmetic Multiple Device
(D) None of the above

37. Cyrix makes
(A) Monitor
(B) Microprocessor
(C) Printer
(D) None of the above

38. Hertz Means
(A) One cycle per Minute
(B) One cycle per second
(C) One cycle per milli second
(D) One cycle per hour

39. PCI was developed by
(A) Motorola
(B) ASCII
(C) Intel
(D) None of the above

40. The function of NIC is
(A) Link computer with memory
(B) Link computer with network
(C) Link computer with printer
(D) None of the above

41. Laser printer uses
    - (A) PDL
    - (B) HTML
    - (C) COBOL
    - (D) None of the above

42. Printer resolutions are measured in
    - (A) Bits per inch
    - (B) Dots per inch.
    - (C) Dots per centimeter
    - (D) None of the above

43. Photo sensitive chip used in a video camera is known
    - (A) BCD
    - (B) CCD
    - (C) FDD
    - (D) None of the above

44. ..... is internet address.
    - (A) HTML
    - (B) URL
    - (C) HTTP
    - (D) None of the above

45. PTM is a .....
    - (A) Utility software
    - (B) System software
    - (C) Application software
    - (D) None of the above

46. Which is pre cursor of the internet?
    - (A) Gopher
    - (B) ARPANET
    - (C) IETF
    - (D) None of the above

47. Gateway works on ..... level of OSI model.
    - (A) 2
    - (B) 3
    - (C) 7

(D) None of the above

48. ..... provides port number.
    (A) IETF
    (B) IANA
    (C) MIMC
    (D) None of the above

49. Storage capacity of floppy is maximum in .....
    (A) DSSD
    (B) DSDD
    (C) SSSD
    (D) All the above

50. The ISA is a ..... architecture.
    (A) 8 bit Data bus
    (B) 16 bit data bus
    (C) 32 bit data bus
    (D) 64 bit data bus

51. The serial mouse has a .....
    (A) 9-pin connector
    (B) 16-pin connector
    (C) 25-pin connector
    (D) 32 pin connector

52. Server is also known as .....
    (A) Front end
    (B) Back end
    (C) Connecting end
    (D) None of the above

53. POP is .....
    (A) Mail
    (B) Mail server
    (C) Mail protocol
    (D) None of the above

54. Inventor of WWW is .....

(A) Bill Gates
(B) Sachin Tendulkar
(C) Tim Berner Lee
(D) None of the above

55. ISA has ..... number of address line.
(A) 18
(B) 24
(C) 16
(D) 20

56. The 5.25 inch floppy can ..... MB data.
(A) 2.8 MB
(B) 1.2 MB Data
(C) 1.4 M.B
(D) None of the above

57. Which one is not a Database Management system.
(A) Access
(B) Fox Pro
(C) Netscape
(D) Oracle

58. The .....was created in 1989 at the European particle. Physics aboratoryin Geneva, Switzerland.
(A) Arpanet
(B) WWW
(C) Firewalls
(D) folders

59. The operating system uses ..... to help the CPU coordinate processes.
(A) Webs
(B) Interrupt Requests (IRQ) I
(C) Firewalls
(D) Folders

60. Refresh rate of monitors is measured in
(A) Hertz
(B) measured in
(C) Megavolt
(D) Megahorse

61. PCI is a type of .....
    - (A) Plug; and Play
    - (B) Browser
    - (C) Bus
    - (D) Software

62. PPP stands for
    - (A) Print to print protocol
    - (B) Point to point Protocol
    - (C) Print to Print protocol
    - (D) none of the above

63. Cache memory is
    - (A) Temporary and costly
    - (B) Point to point protocol
    - (C) High speed memory
    - (D) None of the above

64. A GUI is a
    - (A) Hardware
    - (B) Language interpreter
    - (C) Software interface
    - (D) An operating system

65. Which of the following is not a procedural language.
    - (A) PASCAL
    - (B) Basic
    - (C) Visual Basic
    - (D) None of the above

66. A .....works like an upside-down mouse.
    - (A) Joystick
    - (B) TGrackpad
    - (C) Trackpoint
    - (D) Trackball

67. On a CD-ROM data is stored in the form of .....& .....
    - (A) Lands and pits
    - (B) Dots and Dash
    - (C) High and Low

(D) None of these

68. TCP/IP is
    (A) Software
    (B) Hardware
    (C) Network
    (D) None of the above

69. Computer virus is a .....
    (A) Hardware
    (B) Software
    (C) Both A &B
    (D) None of the above

70. Three types of memory chips are RAM, ROM and
    (A) EISA
    (B) RISC
    (C) CD-ROME
    (D) CMOS

71. Which one is not a multitasking operating system
    (A) MS-DOS
    (B) Windows
    (C) LINOX
    (D) UNIX

72. .....provides field for entering or comment of any length.
    (A) Counter field
    (B) Logical field
    (C) Memo field
    (D) Date field

73. The scroll lock key is a .....key.
    (A) Function
    (B) Numeric
    (C) Toggle
    (D) Cursor control

74. A PCM CIA hard drive uses.....

(A) Type I slot
(B) Type II slot
(C) Type III slot
(D) Type IV slot

75. Tape is accessed
(A) Randomly
(B) Sequentially
(C) Direct
(D) None of the above

76. A devise that receives analog signal and converts them into digital data is known as
(A) Modulator
(B) Demodulator
(C) Multiplexer
(D) None of the above

77. Master Boot Record is also known as
(A) Partition Sector
(B) Master Partition table
(C) Both A and B
(D) None of the above

78. Electronic instructions that tells the hardware what to do are known as
(A) Modem
(B) Electronic pen
(C) Program
(D) Micro computer

79. Which of the following memories need refresh?
(A) SRAM
(B) DRAM
(C) ROM
(D) All of the above

80. The number of records contained within a block of data on magnetic tape is defined by the
(A) Block definition
(B) Record contain clause
(C) Blocking factor
(D) Record per block

81. Mark I is also known as
    - (A) American Sequence Controlled Calculator
    - (B) Automatic Sequence Calculating Controller
    - (C) American Sequence Controlled Computer
    - (D) Automatic Sequence Controlled Calculator

82. Which of the following registers is loaded with the contents of the memory location pointed by the PC?
    - (A) Memory address registers
    - (B) Memory data registers
    - (C) Instruction register
    - (D) Program counter

83. Which of the following are the cheapest memory devices in terms of Cost/Bit?
    - (A) Semiconductor memories
    - (B) Magnetic Disks
    - (C) Compact Disks
    - (D) Magnetic Tapes

84. MIS is designed to provide information needed for effective decision making by?
    - (A) Consumers
    - (B) Workers
    - (C) Foremen
    - (D) Managers

85. Which is valid statement
    - (A) 1 KB = 1024 Bytes
    - (B) 1 MB = 1024 Bytes
    - (C) 1 KB = 1000 Bytes
    - (D) 1 MB = 1000 Bytes

86. Latency time is
    - (A) Time to spin the needed data under head
    - (B) Time to spin the needed data under track
    - (C) Time to spin data under sector
    - (D) All of above

87. Who built the first Mechanical Calculator
    - (A) Joseph Marie Jacquard
    - (B) John Mauchly
    - (C) Blaise Pascal

(D) Howard Aiken

88. The most important advantage of a video disk is
    (A) Compactness
    (B) Potential capacity
    (C) Durability
    (D) Cost effectiveness

89. Which of the following generation computers had expensive operation cost?
    (A) First
    (B) Second
    (C) Third
    (D) Fourth

90. An IBM system/38 represents the computer class of
    (A) Small-scale computer
    (B) Medium-scale computer
    (C) Large-scale computer
    (D) Super computer

91. Another word for a daisy wheel printer
    (A) Petal printer
    (B) Golf ball printer
    (C) Laser printer
    (D) Line printer

92. Cursor is a
    (A) Pixel
    (B) Thin blinking line
    (C) Pointing device
    (D) None of these

93. Which device is used to backup the data?
    (A) Floppy Disk
    (B) Tape
    (C) Network Drive
    (D) All of the above

94. Which of the following printers are you sure will not to use if your objective is to print on multi carbon forms?

A Daisy wheel

B Dot matrix

C Laser

D Thimble

95. Which of the following items are examples of storage devices?

A Floppy / hard disks

B CD-ROMs

C Tape devices

D All of the above

96. ASCII and EBCDIC are the popular character coding systems. What does ASCII stand for?

A American Stable Code for International Interchange

B American Standard Case for Institutional Interchange

C American Standard Code for Information Interchange

D American Standard Code for Interchange Information

97. Which computers are used as servers for any medium sized organizations?

A Mainframe Computer

B Mini Computers

C Micro Computers

D Super Computers

98. Slide Rules was invented in

A 1614

B 1617

C 1620

D None of above

99. A typical personal computer used for business purposes would have.....of RAM.

A 4 KB

B 16 K

C 64 K

D 256 K

100. The ALU of a computer normally contains a number of high speed storage element called

A Semiconductor memory

B Registers

C Hard disks

D Magnetic disk

101. Which was the computer conceived by Babbage?

(A) Analytical Engine
(B) Arithmetic Machine
(C) Donald Kunth
(D) All of above

102. The processing speed of first generation computers was

(A) milliseconds
(B) microseconds
(C) nanoseconds
(D) picoseconds

103. Model 5100 was ..... in 1957.

(A) The first PC built by IBM
(B) The first PC built by Apple
(C) The first PC built by Motorola
(D) The first PC built by Intel

104. VGA is

(A) Video Graphics Array
(B) Visual Graphics Array
(C) Volatile Graphics Array
(D) Video Graphics Adapter

105. A kind of scanner MICR is the short form of

(A) Magnetic Ink Character Reader
(B) Magnetic Ink Code Reader
(C) Magnetic Ink Cases Reader
(D) None of the above

106. Which of the following is not a class based on size?

(A) Mainframe Computer
(B) Micro Computer
(C) Mini Computer
(D) Digital Computer

107. Which 8-bit chip was used in many of today's TRS-80 computers?

(A) Z-8000
(B) Motorola 6809
(C) Z-8808

(D) Z-80

108. Which of the following disk is fixed disk?

(A) Hard Disks
(B) Flash Disks
(C) Blu-Ray Disks
(D) DVDs

109. Which of the following professions has not been affected by personal computers?

(A) Medical
(B) Clerical and law
(C) Accounting
(D) None of the above

110. The word Abacus is derived from Abax, a word from

(A) Latin language
(B) Greek Language
(C) Sanskrit language
(D) Ancient Egypt

111. In latest generation computers, the instructions are executed

(A) Parallel only
(B) Sequentially only
(C) Both sequentially and parallel
(D) All of above

112. Which of the following memory medium is not used as main memory system?

(A) Magnetic core
(B) Semiconductor
(C) Magnetic tape
(D) Both A and B

113. An online backing storage system capable of storing larger quantities of data is

(A) CPU
(B) Memory
(C) Mass storage
(D) Secondary storage

114. A kind of serial dot-matrix printer that forms characters with magnetically-charged ink sprayed dots is called

(A) Laser printer
(B) Ink-jet printer
(C) Drum printer
(D) Chan printer

115. Which of the following does not affect the resolution of a video display image?
(A) Bandwidth
(B) Raster scan rage
(C) Vertical and horizontal lines of resolution
(D) Screen size

116. Which of the following printing devices an output composed of a series of data?
(A) Wire matrix printer
(B) Band printer
(C) Wang image printer
(D) Both A and C

117. Which of the following is an example of fifth generation computer?
(A) PIM/m
(B) ICL 2950
(C) IBM 1401
(D) None of above

118. Magnetic disks are the most popular medium for
(A) Direct access
(B) Sequential access
(C) Both A and B
(D) None of above

119. Which of the following is not a third generation computer?
(A) IBM 360
(B) IBM 1401
(C) PDP-8
(D) HP2115

120. What is a compiler?
(A) A compiler does a conversion line by line as the program is run
(B) A compiler converts the whole of a higher level program code into machine code in one step
(C) A compiler is a general purpose language providing very efficient execution
(D) None of the above

121. ..... computers are also called personal computers

(A) Mainframe Computer

(B) Mini Computers

(C) Micro Computers

(D) Super Computers

122. Which of the following is not input unit device?

(A) scanner

(B) camera

(C) plotter

(D) digitizer

123. Identify the correct statement

(A) IBM PCs used RISC CPU designs

(B) Macintosh used CISC CPU design

(C) IBM used CISC CPU design

(D) None of above is true

124. Which of the following statement is false?

(A) Mechanical analog computers have existed for thousands of years

(B) There are mechanical analog computers and electronic analog computers.

(C) All electronic computers are digital computers

(D) All of above are false

125. Which of the following require large computers memory?

(A) Imaging

(B) Graphics

(C) Voice

(D) All of Above

126. The two major types of computer chips are

(A) External memory chip

(B) Primary memory chip

(C) Microprocessor chip

(D) Both B and C

127. Microprocessors as switching devices are for which generation computers

(A) First Generation

(B) Second Generation

(C) Third Generation

(D) Fourth Generation

128. What is the main difference between a mainframe and a super computer?

(A) Super computer is much larger than mainframe computers

(B) Super computers are much smaller than mainframe computers

(C) Supercomputers are focused to execute few programs as fast as possible while mainframe uses its power to execute as many programs concurrently

(D) Supercomputers are focused to execute as many programs as possible while mainframe uses its power to execute few programs as fast as possible.

129. ASCII and EBCDIC are the popular character coding systems. What does EBCDIC stand for?

(A) Extended Binary Coded Decimal Interchange Code

(B) Extended Bit Code Decimal Interchange Code

(C) Extended Bit Case Decimal Interchange Code

(D) Extended Binary Case Decimal Interchange Code

130. The brain of any computer system is

(A) ALU

(B) Memory

(C) CPU

(D) Control unit

131. Storage capacity of magnetic disk depends on

(A) tracks per inch of surface

(B) bits per inch of tracks

(C) disk pack in disk surface

(D) All of above

132. The two kinds of main memory are

(A) Primary and secondary

(B) Random and sequential

(C) ROM and RAM

(D) All of above

133. Which of the following devices can be sued to directly image printed text?

(A) OCR
(B) OMR
(C) MICR
(D) All of above

134. The output quality of a printer is measured by
(A) Dot per inch
(B) Dot per sq. inch
(C) Dots printed per unit time
(D) All of above

135. In analog computer
(A) Input is first converted to digital form
(B) Input is never converted to digital form
(C) Output is displayed in digital form
(D) All of above

136. Which of the following memories needs refresh?
(A) SRAM
(B) DRAM
(C) ROM
(D) All of above

137. Through which device the main components of the computer communicate with each other?
(A) Keyboard
(B) System Bus
(C) Monitor
(D) Memory

138. What type of device is computer keyboard?
(A) Memory
(B) Output
(C) Storage
(D) Input

139. Which is the limitation of high level language?
(A) Lower efficiency
(B) Machine dependence
(C) machine level coding
(D) None of above

140. An example of a digital device can be

(A) Digital clock

(B) Automobile speed meter

(C) Clock with a dial and two hands

(D) All of the above

141. Which of the following is not true?

(A) Transistors are much smaller

(B) Transistors produce low heat

(C) Transistors were less reliable

(D) Transistors were used in radios and other electronic devices

142. A characteristic of card systems is

(A) Slowness in processing data

(B) Using cards as records of transactions

(C) Needing a larger DP staff

(D) All of the above

143. The full form of EEPROM is

(A) Electrically Erasable Programmable Read Only Memory

(B) Easily Erasable Programmable Read Only Memory

(C) Electronic Erasable Programmable Read Only Memory

(D) None of the above

144. The original ASCII code used ..... bits of each byte, reserving that last bit for error checking

(A) 5

(B) 6

(C) 7

(D) 8

145. A computer programmer

(A) Does all the thinking for a computer

(B) Can enter input data quickly

(C) Can operate all types of computer equipments

(D) Can draw only flowchart

146. Fifth generation computer is also known as

(A) Knowledge information processing system

(B) Very large scale integration (VLSI)

(C) Both of above

(D) None of above

147. The commonly used standard data code to represent alphabetical, numerical and punctuation characters used in electronic data processing system is called

(A) ASCII

(B) EBCDIC

(C) BCD

(D) All of above

148. Which of the following have low failure rate?

(A) mechanical devices

(B) electronic devices

(C) electro-mechanical devices

(D) None of above

149. Who designed the first electronics computer- ENIAC?

(A) Van-Neumann

(B) Joseph M. Jacquard

(C) J. Presper Eckert and John W Mauchly

(D) All of above

150. Who invented the high level language C?

(A) Dennis M. Ritchie

(B) Niklaus Writh

(C) Donald Kunth

(D) Coreman and Rivest

Probable answer key.

If you get any wrong answer please mail me at narayan.changder@gmail.com. I am still working on answer key. Dont only criticise, rather report right answer at above email or you can message me in facebook

Answers

1. C 2. B 3. A 4. C 5. D 6. A 7. D 8. D 9. C 10. B 11. C 12. C 13. C 14. A 15. B
16. B 17. C 18. B 19. A 20. D 21. C 22. A 23. B 24. B 25. C 26. A 27. C 28. B 29. C
30. C 31. B 32. C 33. C 34. C 35. C 36. B 37. B 38. B 39. C 40. B 41. A 42. B 43. A
44. B 45. C 46. B 47. C 48. B 49. B 50. B 51. A 52. B 53. C 54. C 55. B 56. B 57. C
58. B 59. B 60. A 61. C 63. C 64. C 66. D 67. A 68. A 69. B 70. D 71. A 72. C 73. C
74. C 75. B 76. B 77. C 79. B 80. C 81. D 82. C 83. C 84. D 85. A 86. A 87. C 88. B
89. A 90. A 91. B 92. B 93. D 94. C 95. D 96. C 97. B 98. C 99. D 100. B 101. A 102. A
103. A 104. A 105. A 106. D 107. D 108. A 109. D 110. A 111. C 112. C 113. C 114. B
115. D 116. D 117. A 118. C 119. B 120. B 121. C 122. C 123. C 124. C 125. D 126. D
127. D 128. C 129. A 130. C 131. D 132. C 133. A 134. B 135. B 136. B 137. B 138. D
139. A 140. A 141. C 142. D 143. A 144. C 145. A 146. A 147. D 148. B 149. C 150. A