

NET JRF & SET

PAPER 1

Covers entire syllabus of Paper 1



Professor Academy

PART - I



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NET JRF & SET

PAPER 1

PART - I



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Country's development is vested in the hands of Professors.

PREFACE

Through this book we Professor Academy Team strongly establishes the platform that guides the NET JRF aspirants in cracking the NET JRF exam. This is our main focus to fulfill the requirement of NET aspirants while preparing paper 1, with this one stop, all at one place, resourceful content. The Series of these books is crafted with perfect analysis of NET exam question papers and critical interpretation of the syllabus. The experienced faculties of our Professor Academy Team, who did great achievement in terms of results, have penned down this book as a measure to balance both the needs of NET JRF aspirants as well as demands of the NET exam, well in advance. I hope that those who go through this book in their preparation days will find it fruitful as the book covers the entire updated syllabus in 4 parts, along with unit wise trend analysis and module wise book-back questions that reflect the standard of the NET exam. We strongly believe this book will help you achieve your results by the maximum marks in paper 1. And it's your time! All the very best!

Saravana Perumal M
Director, Professor Academy

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UGC NET Exam:

UGC NET is a national level computer based exam conducted by NTA on behalf of University Grants Commission to certify the eligibility of candidates for the post of 'Assistant Professor' and/or 'Junior Research Fellowship.

Paper	Marks	Numebr of Questions	Pattern	Duration
Paper - I General Paper on Teaching & Research Aptitude Code No. : 00	100	50	The questions will be generic in nature, intending to assess the teaching/research aptitude of the candidate. It will primarily be designed to test reasoning ability, comprehension, divergent thinking and general awareness of the candidate.	03 hours (180 minutes) without any break. All the questions are compulsory.
Paper - II	200	100	This is based on the subject selected by the candidate and will assess domain knowledge.	

* There will be no negative marking in the exam

PAPER-I

Unit-I Teaching Aptitude

- Teaching: Concept, Objectives, Levels of teaching (Memory, Understanding and Reflective), Characteristics and basic requirements.
- Learner's characteristics: Characteristics of adolescent and adult learners (Academic, Social, Emotional and Cognitive), Individual differences.
- Factors affecting teaching related to: Teacher, Learner, Support material, Instructional facilities, Learning environment and Institution.
- Methods of teaching in Institutions of higher learning: Teacher centred vs. Learner centred methods; Off-line vs. On-line methods (Swayam, Swayamprabha, MOOCs etc.).
- Teaching Support System: Traditional, Modern and ICT based.
- Evaluation Systems: Elements and Types of evaluation, Evaluation in Choice Based Credit System in Higher education, Computer based testing, Innovations in evaluation systems.

Unit-II Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Postpositivistic approach to research.

- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-III Comprehension

- A passage of text be given. Questions be asked from the passage to be answered.

Unit-IV Communication

- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-V Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.

- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.).

Unit-VI Logical Reasoning

- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.
- Indian Logic: Means of knowledge.
- Pramanas: Pratyaksha (Perception), Anumana (Inference), Upamana (Comparison), Shabda (Verbal testimony), Arthapatti (Implication) and Anupalabdhi (Non-apprehension).
- Structure and kinds of Anumana (inference), Vyapti (invariable relation), Hetvabhasas (fallacies of inference).

Unit-VII Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-VIII Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.

- Digital initiatives in higher education.
- ICT and Governance.

Unit-IX People, Development and Environment

- Development and environment: Millennium development and Sustainable development goals.
- Human and environment interaction: Anthropogenic activities and their impacts on environment.
- Environmental issues: Local, Regional and Global; Air pollution, Water pollution, Soil pollution, Noise pollution, Waste (solid, liquid, biomedical, hazardous, electronic), Climate change and its Socio-Economic and Political dimensions.
- Impacts of pollutants on human health.
- Natural and energy resources: Solar, Wind, Soil, Hydro, Geothermal, Biomass, Nuclear and Forests.
- Natural hazards and disasters: Mitigation strategies.
- Environmental Protection Act (1986), National Action Plan on Climate Change, International agreements/efforts -Montreal Protocol, Rio Summit, Convention on Biodiversity, Kyoto Protocol, Paris Agreement, International Solar Alliance.

Unit-X Higher Education System

- Institutions of higher learning and education in ancient India.
- Evolution of higher learning and research in Post Independence India.
- Oriental, Conventional and Non-conventional learning programmes in India.
- Professional, Technical and Skill Based education.
- Value education and environmental education.
- Policies, Governance, and Administration

Why does NET exam demand aspirants to skill in Communication?

Brilliant communication skill is the key to overall development of students, Research scholars, Professors besides academic success. The communication skill is undeniably the finest skill of a teacher that inspires and brings out the latent potential of the learners. Irrespective of the subject, the seamless communication is the quintessential element of success. This unit of the book is an effort to sensitize the teachers about the ever-growing importance of communication skills that will help carve out themselves and their potential students as well. Candidates preparing for the NET exam can start their preparation with this unit because communication is one of the simplest units ever and it takes very less time to read. Generally, 5 questions are asked from this unit.

Syllabus

- *Communication: Meaning, types and characteristics of communication.*
- *Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.*
- *Barriers to effective communication.*
- *Mass-Media and Society.*

Trend Analysis

There is an evident shift from mere factual questions to real-time and application-oriented ones. The aspirants are expected to possess a good understanding about communication concepts and theories, right from its origin to its incredible peaks in the modern world such as social media and new media. Familiarity in human psychology in the process of effective communication along with the awareness of probable barriers which are required to be eliminated from the process of communication would help score better in this unit as

application oriented (situation based) questions falls from these mentioned modules. The newly added module mass media gained importance in the recent exams held. This clearly portrays that the pattern of exam shifts towards the factual based questions and terminologies in mass media and Society along with few real-time questions from classroom communication and its barrier. Therefore, much importance, it is to concentrate on Emergence of mass media, its elements, very minute difference between the terminologies such as vlog & blog, new media & social media, etc., which has been discussed in our material after analysing recent previous year question papers thoroughly by the team of specialised faculties.

Blueprint of communication unit

Dear aspirants, understanding the fundamental principles as well as the art of effective communication with the aid of media is needed to score full marks in this subject. After a complete and detailed analysis syllabus and recent exam questions, the entire communication content has been made as modules in accordance with the same and the modules are

- *Communication – an introductory part*
- *Effective communication*
- *Barriers to communication*
- *Communication model and Theories*
- *Mass Media*

After each module level 1 questions which are memory based questions assessing recollecting ability of the aspirants and level 2 questions which are application-based questions assessing the conceptual understanding of the aspirants has been given with the answer key, which the candidate can practice to bench mark their preparation.

START READING, SCORE BETTER!

Communication - an Introduction

Communication can be defined as, “ the process of understanding and sharing meaning”. Communicating helps people to express their ideas and feelings. It also helps us to understand emotions and thoughts of others. The word ‘communication’ is derived from the **Latin verb – ‘communicare’** meaning ‘to share publically and make common’.

Communication is a two-way process in which participants exchange ideas, information, feelings and emotions. They create and share meaning for reaching mutual understanding. It is the process by which an idea is brought to another’s perception. Communication is the expression by speech, writing, gestures, conduct or electronic medium. The information that is so expressed or exchanged is also referred to as communication. It is a complex and dynamic process that allows organisms to exchange information.

Elements of communication

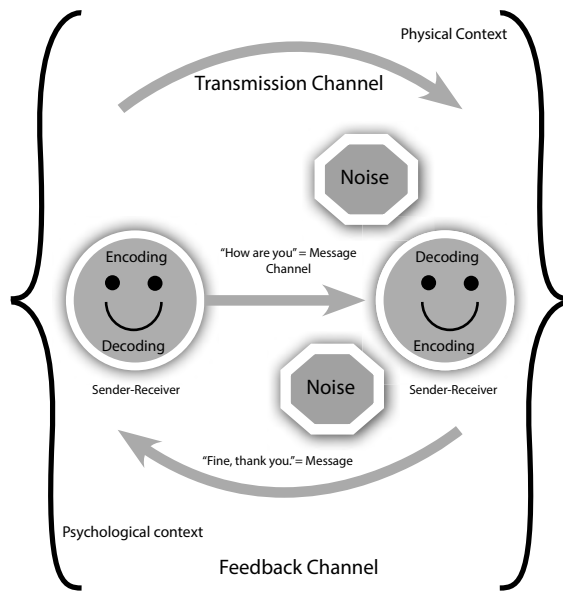
Communication is a process of sending and receiving a message through verbal or non-verbal means, which may be speech or oral communication, writing and graphical representations, signs, signals or behaviour. Thus communication involves at least two people- a sender and a receiver. Communication process is more complex than it sounds. It consists of a series of elements that results in sharing of meaning by sender and receiver. The elements are discussed below:

Sender/ Source: The Sender is a person who initiates, generates and sends the message. The sender is the source of message. The communication process begins when the sender develops an idea (usually with a thought in his mind) or message he wants to transmit. He must arrange the ideas in a manner that can be understood by the receiver. For instance, a lecturer delivering a lecture in the classroom is the sender of the message or a manager addressing his team in a meeting is sender of the message.

Message: The Message is the idea or information that the sender wants to convey. He may convey it verbally (by writing or speaking) or non-verbally (through gestures or body language). Whatever be the form, the message should be clearly formed so that desired

objective is accomplished. In communication interpretation of a message depends upon the context. Sometimes communication stimuli are used to convey the messages are known as codes.

Encoding: Encoding is a process by which the sender is clear of what message to transmit, he decides the code through which the message shall be transmitted. The message is abstract and intangible and, therefore, has to be converted into some form (words, gestures, pictures, etc.) to make it meaningful. Encoding means converting or translating the message into symbols. Encoding gives meaning to the message or converts ideas into codes that can be understood by the receiver. Encoding means translating the message into words (written or spoken), symbols or gestures. The code should be appropriate to the situation that is interpreted by the receiver in the manner intended.



Transmission/ medium/ Channel: Transmission involves selecting the medium or channel of communication. Once decided that the message has to be sent in writing, the sender may select the electronic channel and the medium of e-mail or fax. Short messages can be transmitted through telephone but lengthy messages can be sent through letters or circulars. Choice of the channel depends upon;

- The message to be conveyed
- Personal biases of the sender
- Nature of information

Short messages are generally sent through telephone whereas drawings, charts and illustrations

form part of the message, it should be sent in writing. Personal biases include the sender's preference for a particular channel. Some senders prefer to communicate in writing, however short the message may be and, therefore, prefer the written channel of transmission. Nature of information refers to immediacy and confidentiality of information. Confidential information where immediate feedback is required is generally transmitted orally.

Receiver: The Receiver is the person or a group of people to whom the message is conveyed. In case of telephonic conversation, the sender can send a message to one receiver but in case of group discussions, seminars and conferences, receivers can be more than one. The message must be designed, encoded and transmitted in a manner that a receiver can understand it easily. Use of technical words, jargons and complicated symbols should be avoided. Depending on the channel selected, receiver may be a listener, viewer or a reader.

Decoding: Decoding is a process of giving meaningful interpretation to the message. On receiving the message, the receiver translates the symbols into meaningful information to the best of his ability. Communication is effective if the receiver understands the message in the same way as intended by the sender. The receiver must, therefore, be familiar with the codes and symbols used by the sender.

Feedback:

- Feedback is the receiver's response to sender's message. The receiver communicates his reaction to the sender through words, symbols or gestures. It is the reversal of communication process where receiver becomes the sender and sender becomes the receiver. Unless the receiver responds to the message, communication process is incomplete.
- Feedback helps the sender to transform his message, if needed. It also allows the receiver to clear doubts about the message, ask questions to build his confidence and enable the sender to know the efficiency of the message. Feedback makes the communication process complete.
- In face-to-face communication, the sender can immediately receive the feedback but in written communication, it takes time for the sender to receive feedback on the message. A written notice sent by manager to the employees to work six days a week instead of five can be implemented

when everybody has read and signed the notice. Subordinates will give feedback on the notice and recommend changes, if required. Managers can implement the notice only if it is accepted by the subordinates, unless it is an order.

- Feedback plays important role in two-way communication. In one-way communication, sender communicates with the receiver without getting any feedback but in two-way communication, receiver provides feedback to the sender. Though one-way communication takes less time and is more orderly (it avoids noise and chaos), feedback in two-way communication makes it more accurate and precise.

Process of communication

Communication process is a sequence of activities where the message is created, encoded, sent and message sent is decoded understood by the receiver in its intended meaning. A process is "a systematic series of actions, operations or series of changes directed to some end." The stages of message processing involves perception, understanding selection internalization, action. However, in real life situations, communication process is more complex than it sounds. It consists of a series of elements which results in sharing of meaning by sender and receiver, the Process of Communication are of two phases. They are transmission Phase and Feedback phase.

- **Transmission Phase** - The message is transmitted from Sender to Receiver. It consists of elements such as sender(source), message, channel, receiver.
- **Feedback Phase** - The Response or Feedback received by the sender from the Receiver. So, here receiver sends the message. It consists of elements such as feedback, environment or ambiance from which it is received, context of feedback and also interpretation of feedback.

Goffman's Theory of Communication Constraints

The systematic framework for the analysis of discourse is provided by Goffman's theory of communication constraints. It claims that certain characteristics of verbal communication are systematically controlled by the nature of

communication system. Those characteristics are language-universal and so they should be present in all types of verbal communication. Interacting with these system constraints is the set of ritual constraints which add to them a 'social' dimension. They reflect as well as construct social norms regulating behaviour of their members.

System constraints

1. **Channel open and close signals:** When the communication begins, a channel opens. It has formal expressions like introductory and/or farewell greetings, enquiries about one's well-being, etc. Also it is important to ensure whether the other person understands and responds back.
2. **Back channel signals:** They secure the transfer of the information that the message is being received and shows the degree of involvement of the receiver. It may be verbal or non-verbal and may vary as to the degree of their speed and spontaneity.
3. **Turnover signals:** They project the end of individual contributions and the readiness to 'yield the floor' – linguistic, paralinguistic (reestablishment of eye-contact), suprasegmental (lowered intonation). These shifts normally happen smoothly and even if overlaps occur, they may indicate involvement rather than hostility or conflict. The right to produce an extended turn by a speaker is often ensured by a preannouncement or a ticket.
4. **Acoustically adequate and interpretable messages:** The message must be comprehensible. In case of communication noise and or an interpretation problem, a request for clarification is raised. Attempts are made to make the understanding better.
5. **Bracket Signals** help separate 'off-line' talk from 'on-line' talk – they mark the beginning of a side sequence and a return to the main message. In writing, the bracketed asides are conventionally marked off spatially (footnotes) or by punctuation (parentheses, dashes).
6. **Non-participant constraints:** A nonparticipant can't simply enter an ongoing conversation but must compete for the entry to become a participant by e.g., gazing steadily or intently, waving, asking for a permission to enter conversation, etc.,
7. **Pre-empted signals:** They are ways of interrupting ongoing communication. As they are presented by a non participant, permission must be elicited (e.g., by formulaic excuse me, or May I interrupt?); the signals may alter the course of communication or bring it to an end,

8. **Gricean norms** for communication include the principles of quality, quantity, relevance and mannerism, clarity.

Types of communication

Communication is described depending upon the situation in which communication takes place. We communicate with ourselves, with others face to face, using a public address system with a large number of people or use radio or television. The Communication can be classified into many based on following criteria:

- Media/Expression/Channel
- Direction of flow of Communication
- Organisational relations
- Agents (Sender and Receiver)


a) Types based on Media/Expression/Channel

Verbal Communication

This involves the use of language and words for the purpose of passing on the intended message. But, in the context of types of communication, verbal communication can be in the spoken or the written form. Thus, the verbal form may be oral or written.


- **Written Communication:** This kind of communication involves any kind of exchange of information in the written form. For example, e-mails, texts, letters, reports, SMS, posts on social media platforms, documents, handbooks, posters, flyers, etc. the efficiency in written communication may involve Effective use of words, concise (brevity), proof reading (editing) after writing.
- **Oral Communication:** This is the communication which employs the spoken word, sent through communication channel air in case of face to face(direct/synchronous communication - which immediately receives response/reply/feedback) or over the phone. This verbal communication could be made on a channel that passes information in only one form i.e. sound.

Development of Communication System

- 


1

-97900 B.C.E.

ROCK SCRATCHES
Engraved pieces of ochre in South Africa's Blombos Cave date as far back as 100,000 years ago, providing some of the earliest evidence of the human ability to create symbols.
- 


2

-38800 B.C.E.

CAVE PAINTINGS
Early cave art deepens our understanding of the origins of human expression. To date, the oldest known cave painting is a 40,800-year-old red disk found in El Castillo, Spain, followed closely by 35,000-year-old works in Sulawesi, Indonesia and Chauvet Cave, France.
- 


3

6600 B.C.E.

TORTOISE SHELL SYMBOLS
While Chinese inscriptions in tortoise shells, also known as oracle bones, can be traced back to as early as 6600 B.C.E., the bulk of these inscriptions were made during the Shang Dynasty, between 1300 and 1100 B.C.E.
- 


4

3500 B.C.E.

CUNEIFORM
Cuneiform, a system of making wedge-shaped impressions into a tablet of clay, was developed between 3500 and 3000 B. C.E. by the Sumerians in Mesopotamia and is one of the earliest forms of writing.
- 


5

3200 B.C.E.

HIEROGLYPHICS
Egyptian hieroglyphs, dating to 3200 B.C.E., contain different types of characters that represent either words or sounds. "Hieroglyph" means "holy writing" in Greek; the Egyptians called the symbols "medunetjer," or "the gods' words."
- 


6

-2150 B.C.E.

THE EPIC OF GILGAMESH
While the real Gilgamesh ruled the ancient city-state of Uruk in 2700 B.C.E., Sumerians wrote tales about his adventures for centuries in what is considered one of the first works of literature. The most complete version of this epic poem is recorded in the Akkadian language on 12 clay tablets.
- 


7

-1900-1700 B.C.E.

PROTO-SINAITIC ALPHABET
Sometime between 1900 and 1700 B.C.E, Semitic-speaking peoples adapted Egyptian hieroglyphs into Proto-Sinaitic script, the world's first alphabet. More than 1,000 years later, the Latin alphabet emerged.
- 


8

A.D. 600

PRINTING
Around A.D. 600, the Chinese developed woodblock printing, an early printing technique that carved wood into stamps. In the mid-1400s, Johannes Gutenberg expedited the process with mechanical movable type and the printing press, which gave rise to mass printing.
- 


9

1824

BRAILLE
Louis Braille's invention of Braille in 1824 brought reading and writing to the visually impaired. Originally featuring a series of dot patterns representing the French language, Braille today serves almost every language.
- 


10

1958

PEACE SYMBOL & SMILEY FACE
In 1958, British artist Gerald Holtom designed the famous peace sign for a nuclear disarmament campaign, creating a form of communication both portable and truly international. Harvey Ball repeated the symbolic success with the iconic smiley face in 1963.
- 

11

1969

DIGITAL COMMUNICATION
In 1969, UCLA student Charles Kline set off a revolution in communication when he sent the incomplete word "10" to a computer at Stanford University over ARPANET. More digital communication followed: the first mobile phone call (1973), the invention of the World Wide Web (1989), and the first text message (1992).
- 

12

1999

EMOJIS
In 1999, the Japanese cell phone company NTT DOCOMO released the first emojis, a set of 176 characters designed by Shigetaka Kurita. Twelve years later, Apple released its widely popular set of emojis.



INTERESTING FACTS!

The Acta diurna (before 59 B.C) also called Acta populi or Acta publica is a recorded official business and matters of public interest. The Acta diurna constituted a type of daily gazette and thus it was, in a sense, the prototype of the modern newspaper.

Open communication system (Theory of Verbal communication)

Verbal communication is a subsystem of a human communication, it therefore exhibits all features of an open communication system. The following characteristics provide an insight into the nature of 'the speechmaking system' from this perspective .

- a. **Importation of energy** from outside the system is achieved through the goal of communication which provide the system with 'energy'.
- b. **Through put** means that verbal communication proceeds through coordinated activity of various subsystems involved (conceptualization, verbalization, articulation, perception, interpretation, etc.).
- c. **Output** is manifested by achievement of an intended goal.
- d. **Systems** as cycles of events verbal communication is a continuous process as it involves recurring patterns of activities.
- e. **Entropy (order)** is a tendency towards degeneration of order existing within systems (e.g., when the perspective of a communicative goal is lost, verbal communication may easily lead to a breakdown).
- f. **Steady state and dynamic homeostasis** represents an effort which, contrary to entropy, attempts to preserve balance within the language system and integrity of the communication process as well as to avoid communication failure.
- g. **Feedback** means that partners reciprocally monitor their reactions and accordingly adjust their communicative behaviour.
- h. **Differentiation** stands for the development and refinement of various components (e.g., skills) during the process of continuous communication.

Non-Verbal Communication

In this type of communication, messages are relayed without the transmission of words. The messages here are wordless messages. Non verbal communication do not depend on channel. It supplements verbal communication with gestures, body language, symbols, and expressions. Through these, one may communicate one's mood or opinion or even show a reaction to the messages that are relaying. One's non-verbal actions often set the tone for the dialogue. The non verbal communication involves signs, symbols, codes, colours.

Physical Non-verbal Communication

This is the sum total of the physically observable part of communication. For instance, hand gestures, body language, facial expressions, the tone of one's voice, posture, stance, touch, gaze, and others. Several researchers have revealed that physical nonverbal communication constitutes the majority of our daily communication.

These are subtle signals that are picked up as part of our biological wiring. For example, if you rest your head on your palms, it will mean that you are very disappointed or angry.

- **Paralanguage:**

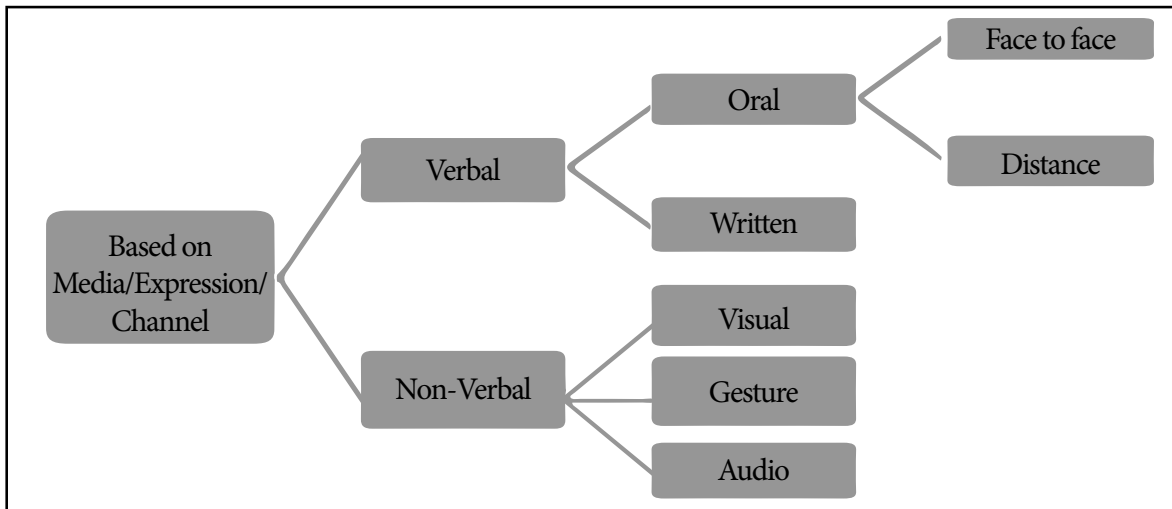
This is the art of reading between the lines. The main kind of such communication is done with the tone of one's voice. This kind of communication amounts that we do every day. Along with the tone of voice, the style of speaking, voice quality, stress, emotions, or intonation serves the purpose of communication. These aspects are not verbal.

- **Aesthetic Communication:**

Art is an important means of communication. Through the paintings or other forms of art, an artist can convey the strongest messages. Several times in the history of the world, art has been used as an effective form of nonverbal communication.

- **Appearance:**

The appearance includes sets the tone. People will react to your appearance and this is a fact of life. The aspects clothes, the color of the fabrics, etc. That determine the reaction of your audience.

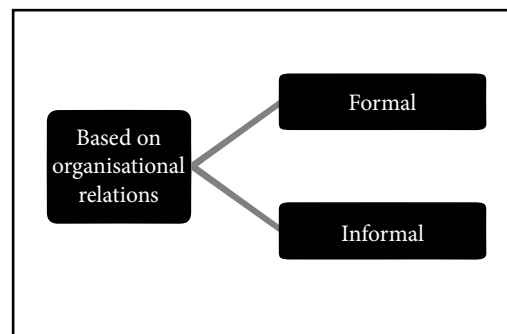
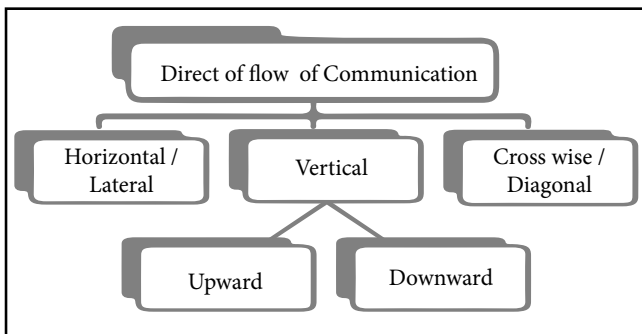


b) Types based on Direction of flow

- **Vertical:** The information or data flows up and down in the organizational structure. This can be either upward (from subordinate to boss) or downward (from boss to subordinate)
- **Horizontal:** This is the communication between

two person in the similar levels of the organization.

- **Diagonal:** This is the communication across the cross-functional levels of employees from various departments of the organization. The other form is the informal or casual communication which is the general communication between random people of the organizations.



c) Types based on Organisational relations

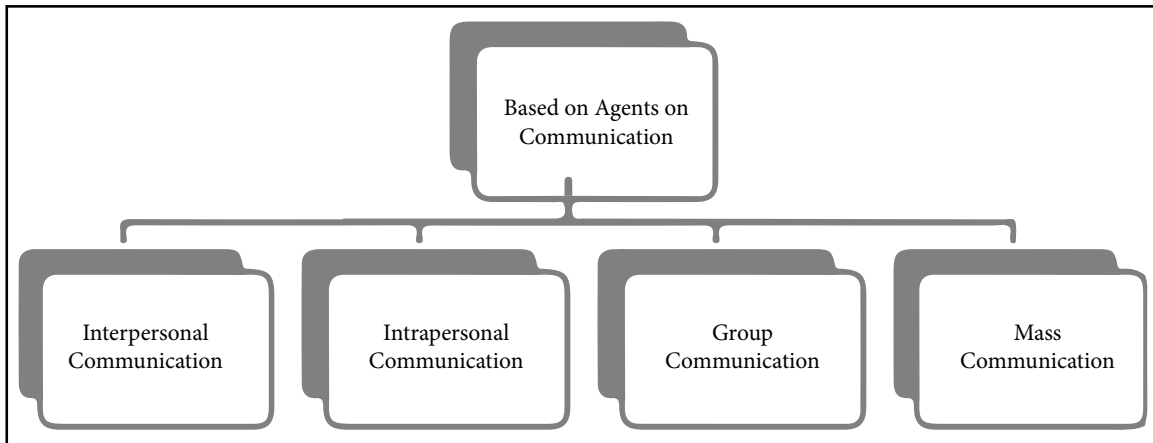
- **Formal communication** refers to interchange of information officially (systematic flow of information). The flow of communication is controlled and is a deliberate effort. Hence formal communication are slow and rigid. This makes it possible for the information to reach the desired place without any hindrance and in a proper way. Formal Communication involves Hierarchy.
- The **Informal Communication** (grapevine communication) is the casual and unofficial form of communication where in the information is exchanged spontaneously between two or more persons without conforming the prescribed official

rules, processes, system, formalities and chain of command.

d) Types based on Agents on Communication

Interpersonal communications:

- Interpersonal communication refers to the type of communication where two people are provided with the means of interaction with one another and are able to exchange information.
- Interpersonal communication can be direct or mediated, depending on whether the sender and the receiver of the information in the process of communication use media, such as telephone or email.



- If technology is required for interpersonal communication, then it is a mediated. When two people are exchanging information face to face, then it is a direct communication. Direct communication is characterized by immediacy and primacy. It happens here and now and has a stronger feedback component than a mediated interpersonal communication. It is preferable for people to discuss via means of direct communication things that require immediate feedback in order to continue the discussion.
- Interpersonal communication can also be categorized by the number of participants.
- Dyadic communication involves two people. For example, a husband and a wife are discussing things during dinner. In dyadic equal opportunities are given to communicate between the two people.

Intrapersonal communication

Intrapersonal communication is the type of communication in which a person is communicating to himself. It takes place entirely within a single individual. Here the Sender and Receiver are the same. Purposes of intrapersonal communication can be of various kinds- from clarifying things to meditating and reflecting on complex ideas. There are several levels of activity in intrapersonal communication:

- **Internal discourse** involving analysis and rendering information. Psychologists include various dreaming processes in this level of intrapersonal communication.
- **Solo vocal communication**, which is performed in order to clarify things or to be relieved of certain thoughts.

- **Solo written communication** is a level of intrapersonal communication an individual expresses his thoughts on paper, being the sole possible reader of the written text. The example of this is a personal diary, prayer in silence This level of intrapersonal communication has to be distinguished from the writings that are addressed to a future audience, such as poetry, love letters, etc.

Intrapersonal communication	Interpersonal communication
• Within a person	• Between two or more persons
• Aspects(Self- awareness, perception and expectation)	• 1-1(Dyadic), group, Public
• Asynchronous	• Synchronous
• At any time	• Possible only when both sender and receiver are ready
• No external feedback	• External feedback
• No receiver	• Receiver is available
• Daydreaming, diary writing, planning, journaling, soliloquy, introspection, rehearsing, etc	• Oral, written, verbal and non-verbal communication
• Can be reversed	• Can't be reversed
• Informal	• Formal or informal
• In the context of teaching: Planning, contemplating & analysing	• In the context of teaching: Teaching, Clearing doubts, motivation, etc

Group Communication

Group communication is an extension of interpersonal communication where more than two individuals are involved in exchange of ideas, skills and interests. A group is a number of people with a common goal who interact with one another to accomplish their goals, recognize one another's

existence and see themselves as part of the group. Groups provide an opportunity for people to come together to discuss and exchange views of common interest. The stages of group communications are forming, storming, norming, performing.

Mass communication

Mass communication is a process in which a person, group of people or an organization sends a message through a channel of communication to a large group of anonymous and heterogeneous people



Intercultural Communication:

Intercultural communication (or cross-cultural communication) is a discipline that studies communication across different cultures and social groups or how culture affects communication. It describes the wide range of communication processes and problems that naturally appears within an organization or social context made up of individuals from different religious, social, ethnic and educational backgrounds.

Characteristics of communication:

The Characteristics of Communication are as follows:

1. Two-way process:

Communication is a two-way process of understanding between two or more persons – sender and receiver. A person cannot communicate with himself.

2. Continuous process:

Exchange of ideas and opinion amongst people is an ongoing process in business and non-business organisations. Continuous interaction promotes understanding and exchange of information relevant for decision-making.

3. Dynamic process:

Communication between sender and receiver takes different forms and medium depending upon their moods and behaviour. It is, thus, a dynamic process that keeps changing in different situations.

4. Pervasive:

Communication is a pervasive activity. It takes place at all levels (top, middle, low) in all functional

and organizations. The large group of anonymous and heterogeneous people as either the general public or a segment of the general public. Channels of communication include broadcast television, radio, social media and print. The sender of the message is usually a professional communicator who often represents an organization. Mass communication is an expensive process. Unlike interpersonal communication, feedback for mass communication is usually slow and indirect.

areas (production, finance, personnel, sales) of a business organisation.

5. Two people:

A minimum of two persons — sender and receiver — must be present for communication to take place. It may be between superiors, subordinates and peer group, intra or interpersonal.

6. Exchange:

Communication involves exchange of ideas and opinions. People interact and develop understanding for each other.

7. Means of unifying organisational activities:

Communication unifies internal organisational environment with its external environment. It also integrates the human and physical resources and converts them into organisational output.

8. Verbal and non-verbal:

Though words are active carriers of information, gestures can sometimes be more powerful than words. Facial expressions, sounds, signs and symbols are the non-verbal forms of communication.

9. Mutual understanding:

Communication is effective when sender and receiver develop mutual understanding of the subject. Messages conveyed should be understood by the receiver in the desired sense.

10. Goal-oriented:

Communication is goal-oriented. Unless the receiver and sender know the purpose they intend to achieve through communication, it has little practical utility.

11. Foundation of management:

Though communication is a directing function, it is important for other managerial functions also. Designing plans and organisation structures, motivating people to accomplish goals and controlling organisational activities; all require communication amongst managers at various levels.

12. Communication A means, not an end:

Communication is not an end. Effective communication is a means towards achieving the end, that is, goal accomplishment. It smoothen managerial operations by facilitating planning, organising, staffing, directing and controlling functions.

13. Human activity:

Communication makes accomplishment of organisational goals possible, it is essential that people understand and like each other. If people do not understand each others' viewpoint, there cannot be effective communication.

14. Inter-disciplinary:

Communication is the art of how communicators use knowledge of different fields of study like anthropology, psychology and sociology. Making best use of these disciplines makes communication effective. It is, thus, an inter-disciplinary area of management.

Role of Communication:

Right from the time a child is born, communication plays an important role in his life. Speaking, listening and writing are the common forms of communication. A large part of our time is devoted to communication as we share our thoughts and feelings with individuals and groups of people. Communication helps to develop an organised society with defined roles for each individual.

In the business world, managers perform their tasks and responsibilities through communication. Communication provides the basis for effective implementation of plans, assigning jobs to people, carrying out directions and activities and facilitates control.

Management functions can be performed successfully when managers communicate face-to-face, telephonically or electronically with their superiors, peers, subordinates, customers, suppliers, competitors etc. Even when they are not talking, they are busy reading or writing reports, memos and letters which are different forms of communication. Communication has reduced geographical distances into storable and confidential forms and has facilitated a large number of people to interact with each other.

It is important that communication should be effective. Effective communication is transfer of information along with transfer of understanding. It means transfer of messages, ideas and information in a manner that the sender and receiver understand the subject in the same sense.

“It is the process of sending a message in such a way that the message received is as close in meaning as possible to the message intended.” Effective communication, thus, takes place when receiver understands the message in the same sense as the sender wants to convey.

Communication is the foundation for human interaction that develops common understanding amongst two or more persons. This promotes common objectives through coordinated efforts amongst people belonging to different functional departments.

Important factors in Communication:

Framing is the thought process people use to define a situation and decide how they are going to deal with it. Reframing is doing this over again in a different way: – for example, deciding a conflict can be approached in a positive (or “win-win”) way, rather than a negative (or “win-lose”) way. Reframing is seeing the current situation from a different perspective, which can be tremendously helpful in problem solving, decision making and learning. Reframing is helping person to constructively move on from a situation in which the person feels stuck or confused.

Framing and reframing can be differentiated using the language devices like;

- **Simile:** A simile is a poetic device in which two different things are compared using the words “like” or “as” or “so”. Eg. She fought as brave as a lion.
- **Metaphor:** A metaphor is a poetic device in which two different things are compared without using the words “like”, “as” or “so”. Eg. She has a heart of lion.
- **Hyperbole:** A hyperbole is a poetic device that is used for exaggeration.

Importance of Communication:

The desire to socialize and get formed into organised groups necessitates the need for communication. In the fast changing world, managers communicate changes in technology, structure or people to the subordinates. If the communication system is well organised, it becomes easier for subordinates to understand and act upon the message. Communication plays important role in the lives of individuals and organisations.

1. Basis for planning:

Planning is the basic function of management. If plans are well designed and communicated for their implementation, it leads to organisational success. Planning requires extensive environmental scanning and information about internal and external organisation elements. An effective system of communication helps in obtaining this information. Implementing the plans requires communicating them to everybody in the organisation. Communication is, thus, the basis of planning.

2. Motivation to work:

Employees are motivated to work if their needs are satisfied. Communication helps managers know needs of their employees so that they can adopt suitable motivators and inspire them to develop positive attitude towards the work environment.

3. Job satisfaction:

Exchange of information develops trust, confidence and faith amongst managers and subordinates. They understand their job positions better and, thus, perform better. People are committed to organisational objectives which promotes job satisfaction.

4. Commitment to organisational objectives:

Managers who follow an effective system of communication understand employees’ needs, adopt suitable motivators to satisfy them, appraise their performance and provide them regular feedback. The employees also work with commitment towards organisational objectives.

5. Coordination:

Communication coordinates organisational resources (human and non-human), individual goals with organisational goals and internal environment with external environment. Coordination is the key to organisational success and communication is an active contributor to coordination.

6. Adaptability to external environment:

In order to survive in the changing, dynamic environment, managers continuously interact with external parties like government, suppliers, customers, etc. This requires effective communication system in the organisation.

7. Internal functioning of an enterprise:

Managers interact with parties internal to business enterprises. They constantly obtain and provide information to them. More effective the communication system, more accurate will be the information.

8. Healthy industrial relations:

Satisfied workers contribute to healthy organisations. Communication brings managers and trade unions closer, develops mutual understanding and promotes industrial peace and harmony. This increases industrial production.

9. Helps in performing managerial roles:

According to Henry Mintzberg, managers perform three major roles – interpersonal, informational and decisional. Communication helps managers in performing these roles effectively. In interpersonal roles, managers interact with superiors, peers and subordinates; in informational roles they receive and give information to people inside and outside the organization and in decisional roles, they take important decisions and communicate them to organisational members for their effective implementation.

10. Facilitates leadership:

Effective leaders interact with followers, guide and inspire them to perform the individual and

organisational goals. Effective communication process facilitates leaders to carry out the leadership functions.

11. Facilitates control:

Planning is effective if accompanied by an effective control system. Control is possible when managers assess subordinates' performance, correct and prevent deviations and provide them regular feedback of performance. Control function largely depends upon communication system of the organisation. How effectively managers control organisational activities depends upon how effective is the communication system.

12. Training and development:

Imparting training and development facilities to employees depends upon how well their superiors communicate with them. Trainers with good communication skills are better than those who have poor communication skills.

13. Substance to organisational existence:

Obtaining information to make plans, making members aware of authority-responsibility structure, position in the organisational hierarchy, coordinating their activities is the essence of organisational survival and growth. This is possible through effective communication.

Self Evaluation

LEVEL 1

1. The word communication is derived from _____ verb.
a) Latin b) French c) German d) England
2. The English word 'Communication' is derived from the words
a) Communis and Communicare
b) Communist and Commune
c) Communism and Communalism
d) Communion and Common sense
3. Encoding means _____
a) Translating the message
b) Speaking to receiver
c) Written message
d) Meaningful interpretation
4. Communication stimuli used to convey the message is known as [Sept-2020]
a) Process b) Power
c) Channel d) Codes
5. The type of communication in which the sender immediately receives the feedback is _____
a) Written b) Spoken
c) Face -to-face d) Mass communication
6. In transmission phase, the message is transmitted from _____
a) Encoding to Medium
b) Receiver to Sender
c) Medium to Encoding
d) Sender to Receiver
7. In which phase does the receiver send the message?
a) Transmission phase [Nov-2020]
b) Aesthetic phase
c) Noise phase
d) Feedback Phase
8. In the process of communication, which one of the following is in the chronological order?
a) Communicator, medium, receiver, effect message
b) Medium, communicator, message, receiver, effect
c) Communicator, message, medium, receiver, effect
d) Message, communicator, medium, receiver, effect
9. Dyadic Communication involves _____ persons
a) Two b) Group c) One d) Three
10. Chronological order of non-verbal communications is
a) Signs, symbols, codes, colours
b) Symbols, codes, signs, colours
c) Colours, signs, codes, symbols
d) Codes, colours, symbols, signs
11. Which of these does not comes under communication based on the channel?
a) Verbal b) Non - verbal
c) Written d) Formal
12. The term 'grapevine' is also known as
a) Downward communication
b) Informal communication
c) Upward communication
d) Horizontal communication
13. Mass communication takes place among a large group of anonymous and _____ people. [Nov-2020]
a) Homogeneous b) Heterogeneous
c) Group d) Two

14. The concept of entropy as used in communication is related to [Nov-2020]
 a) Virtual reality b) Marketplace
 c) Order d) Communicative language
15. The break-down in verbal communication is described as
 a) Short circuit b) Contradiction
 c) Unevenness d) Entropy

- (A) Environment (B) Feedback
 (C) Context (D) Interference

Choose the correct answer from the the following:
 a) (A), (B), (C), (D) b) (B), (C), (D), (A)
 c) (C), (D), (A), (B) d) (B), (A), (C), (D)

6. Identify the correct sequence of the following:
 a) Source, channel, message, receiver
 b) Source, receiver, channel, message
 c) Source, message, receiver, channel
 d) Source, message, channel, receiver
7. Which of the following are true in respect of communication? It is a [Oct-2020]
 (A) Filtering process (B) Barrier less process
 (C) Life-long process (D) Universal process
 (E) Collective process
 Choose the correct answer from the following:
 a) (A), (B), (C) only b) (B), (C), (D) only
 c) (C), (D), (E) only d) (D), (E), (A) only

Answer Key

1	2	3	4	5	6	7	8	9	10
a	a	a	d	c	d	d	c	a	a
11	12	13	14	15					
d	b	b	c	d					

LEVEL 2

1. The sequence of cultural institutions in communication is [Oct-2020]
 A. Family B. School
 C. Religion D. Mass media
 Choose the correct answer from the following:
 a) A, B, C, D b) B, C, D, A
 c) C, D, A, B d) D, A, B, C
2. Identify the correct sequence of phases in communication development: [Nov-2020]
 (A) Acta Diurna
 (B) Cave paintings
 (C) Wooden blocks for printing
 (D) Development of languages
 (E) Metal printing
 Choose the correct answer from the following:
 a) (A), (B), (D), (C), (E) b) (B), (D), (C), (A), (E)
 c) (C), (D), (E), (A), (B) d) (D), (E), (A), (B), (C)
3. Communication begins usually with [Sept-2020]
 a) Confused ideas b) Semantic noise
 c) Apprehension d) Pictures in the mind
4. Efficacy of written communication depends upon [Sep-2020]
 A. Lengthy presentation
 B. Complex sentence structure
 C. Editing after writing
 D. Brevity in sentences
 E. Use of strong words
 F. Effective use of words
 Choose the correct answer from the the following:
 a) A, B and C only b) B, C and D only
 c) C, D and F only d) D, E and F only
5. Identify the correct sequence of the following elements in the latter part of the communication process after decoding: [Nov-2020]

8. The chronological sequence in the development of communication system is [Sept-2020]
 A. Emergence of language
 B. Cave paintings
 C. Interpersonal communication (verbal)
 D. Appearance of printing technology
 E. Telecommunication system
 Choose the correct answer from the the following:
 a) A, B, C, E, D b) B, E, D, C, A
 c) C, D, E, A, B d) B, A, C, D, E
9. Match List II with List I [Oct-2020]
 LIST I
 A. Prayer in silence
 B. Teacher talking to students outside the classroom.
 C. The CEO of a company issues a circular to his subordinates
 D. Rumour mongering among employees of an organization.
 LIST II
 I. Vertical communication
 II. Grapevine
 III. Intrapersonal communication.
 IV. Group communication.
 Choose the correct answer from the following:
 a) A-II, B-IV, C-I, D-III b) A-III, B-IV, C-I, D-II
 c) A-IV, B- III, C-II, D-I d) A-I, B-II, C- III, D- IV

Answer Key

1	2	3	4	5	6	7	8	9
a	b	d	c	d	d	c	d	b

Effective communication

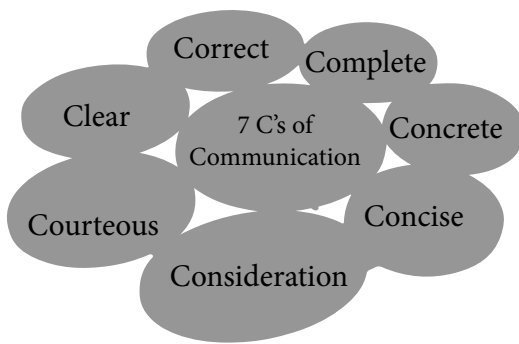
Effective communication occurs when there is shared meaning. The message that is sent is the same message that is received. There must be a mutual understanding between the sender and the receiver for the transmission of ideas or information to be successful. Effective communication presupposes understanding and impart clarity to the audience.

Feature of communication

- Using language that is appropriate to others' levels of understanding.
- Making sure others receive the information or knowledge intended.
- Developing relationships with others.
- Talking with others in a way that facilitates openness, honesty and cooperation.
- Content and Style.
- Providing feedback (2 way communication).

Effective communication is a part and parcel of any successful organization. Any communication should be free from barriers so as to be effective. In a business environment, adherence to the 7 C's and the 4 S's of Communication helps the sender in transmitting his message with ease and accuracy.

i) The 7 C's are as follows:



1. **Completeness** - The communication must be complete. It should convey all facts required by the audience. The sender of the message must take into consideration of the receiver's mind set and convey the message accordingly. A complete communication has following features:
 - Complete communication develops and enhances reputation of an organization.
 - Moreover, they are cost saving as no crucial

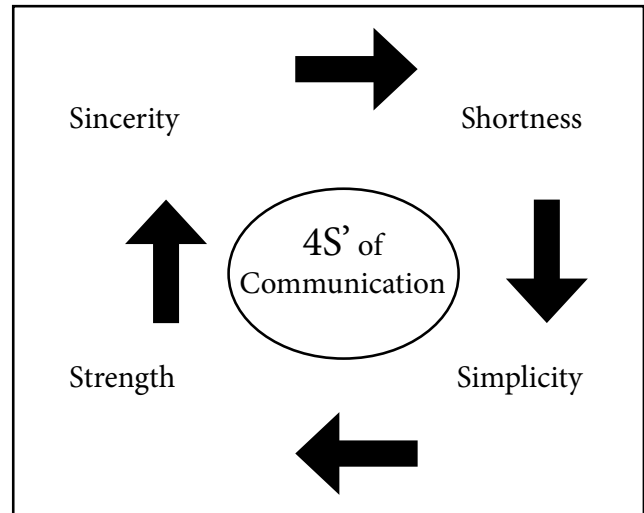
information is missing and no additional cost is incurred in conveying extra message if the communication is complete.

- A complete communication always gives additional information wherever required. It leaves no questions in the mind of receiver.
 - Complete communication helps in better decision-making by the audience/readers/receivers of message as they get all desired and crucial information.
 - It persuades the audience.
2. **Conciseness** - Conciseness means wordiness, i.e, communicating what one's want to convey in least possible words. Conciseness is a necessity for effective communication. Concise communication has following features:
 - It is both time-saving as well as cost-saving.
 - It underlines and highlights the main message as it avoids using excessive and needless words.
 - Concise communication provides short and essential message in limited words to the audience.
 - Concise message is more appealing and comprehensible to the audience.
 - Concise message is non-repetitive in nature.
 3. **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. It is important that the self-respect of the audience is maintained and their emotions are not at harm. Additionally it is essential to modify the words used by speaker/ audience in message to suit the audience's needs while making your message complete. Features of considerate communication are as follows:
 - Emphasize on "you" approach.
 - Empathize with the audience and exhibit interest in the audience(Empathy). This will stimulate a positive reaction from the audience.
 - 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.
 4. **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:

- It makes understanding easier.
 - Complete clarity of thoughts and ideas enhances the meaning of message.
 - Clear message makes use of exact, appropriate and concrete words.
5. **Concreteness** - Concrete communication implies being particular and clear rather than fuzzy and general. Concreteness strengthens the confidence. Concrete message has following features:
- It is supported with specific facts and figures.
 - It makes use of words that are clear and that build the reputation.
 - Concrete messages are not misinterpreted.
6. **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:
- Courtesy implies taking into consideration both viewpoints as well as feelings of the receiver of the message.
 - Courteous message is positive and focused at the audience.
 - It makes use of terms showing respect for the receiver of message.
 - It is not at all biased.
7. **Correctness** - Correctness in communication implies that there are no grammatical errors in communication. Correct communication has following features:
- The message is exact, correct and well-timed.
 - If the communication is correct, it boosts up the confidence level.
 - Correct message has greater impact on the audience/readers.
 - It checks for the precision and accurateness of facts and figures used in the message.
 - It makes use of appropriate and correct language in the message.

ii) 4 S's of Communication:



1 Shortness - It is often said that “Brevity is the soul of wit.” The same can be said about communication. If the message can be made brief, then transmission and comprehension of messages is going to be faster and more effective. Flooding messages with high sounding words does not create an impact. The same message, when repeated will not make it important and hence it is not advised to use two words with same meaning or any word twice.

2 Simplicity - Simplicity both in the usage of words and ideas reveals clarity in the thinking process. Using simple terminology and equally simple concepts would help in delivering the concept while teaching.

3 Strength - The strength of a message emanates from the credibility of the sender. If the sender himself believes in, a message that he is about to transmit, there is bound to be strength and conviction in whatever he tries to state. Half-hearted statements or utterances that the sender himself does not believe in, adds a touch of falsehood to the entire communication process.

4 Sincerity - A sincere approach to an issue is clearly evident to the receiver. If the sender is genuine, it will be reflected in the manner in which he communicates.

Characteristics of Effective Communication

The real meaning of communication is getting the receiver and the sender tuned together for a particular message. Communication takes place when one person transfers some understandable data to another person. It also includes the exchange of thoughts, opinions, sentiments, facts, and information between two or more persons. The important motive of characteristics of communication is to create response from audience. The feedback is very important as it assures that message should be properly conveyed to the receiver.

Why does NET exam demand aspirants to develop Data Interpretation skill ?

Data Interpretation is the process of reviewing data through some predefined processes which will help assign some meaning to the data and arrive at a relevant conclusion. It involves taking the result of data analysis, making inferences on the relations studied, and using them to conclude. The NET exam demands candidate to skill in interpretation of data available as it involves to bring valid conclusion from the factual details and also by this unit, they assess the data analytical skill and numerical analytical skill of a candidate. Data Interpretation is not only about doing mathematical calculation, but also about interpreting the given data and answering the questions asked with the best options provided. To tackle DI questions, learn concepts of average, percentage, ratios and proportions. This is a unit where candidate can secure the maximum marks (10) with constant practice.

Syllabus

Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Trend Analysis

To solve a DI efficiently, candidate need to brush up your calculation skills such as calculating percentages in a short way, etc., On analysing the recent exam questions, it is clear that tabular form of data is most frequently asked though the syllabus also includes pie chart, bar graph, and line graph. Candidates need to perform calculations faster and accurately, as the trend of the exam has shifted towards calculating accurate values rather than approximate values. The DI should be solved within 10-12 minutes. If the time that you take while solving different DI's is more than the time affirmed above, then you really need to work on it. It not only matters about solving all the five questions correctly, but also about solving it fast, which means in a short time scoring the full marks. The other picture which is vivid on analysing the recent exam questions is that options are formulated using fractions. Candidates are required to memorize some of the fraction values that are discussed in the next pages, to make your calculation speedy.

To secure full score in data interpretation, consistency in practice is required. Keep practicing because that's the only key to success as it really helps student to reduce time spent on Data interpretation, leaving more time for other sections and understand that time-management comes with practise. The more you practice, the better you get.

Solving data interpretation every day in the way that the DI questions should appear on your computer/mobile screen and you have to do your rough work in paper that is using pen & paper (which will be the exact scenario of your computer-based exam mode), Such a kind of practise would really help you in time management and stress management in the computer-based exam mode.

Blueprint of Data Interpretation unit

The questions are discussed level wise according to the tone of difficulty. Hence the students are advised go in the sequence from level 1 to level 5. Some Advanced questions are discussed after level 5 and also some recent previous Net questions has been discussed to encourage your confidence by Portraying updated questions.

To understand the blue print of professor acadamy you are required to read about Overview of the question types of the DI.

Overview of the question types of the DI: Observation based questions: These questions require simple and careful observation of the data. Interpretation and Calculation (IC) based questions: These questions require basic analysis and calculation with data. Explorative questions: These questions will pose a scenario, asking the candidate to find and may expect you to use, observation, interpretation and calculation. In level 1 the data set has a greater number of observation-based questions and one or two interpretation & calculation-based (IC) questions. As, the Level increases the IC questions and explorative questions occupy more number in a data set.

The interesting feature of DI is that not all questions in a set are of equal difficulty. Specifically, most sets have a 'counting' type of question (How many companies have profits more than a%, how many people have income less than Rs. z, Finding the ratio by comparing two numbers). Most of these questions can be solved without calculation but by close inspection of the data presented. These questions would be categorized as 'gift' questions designed to test a student's presence of mind, and should never be missed out on.

START PRACTISING! SUCCESS IS YOURS!

Data:

Data is facts and statistics collected together for reference or analysis. Data in numerical format helps us to draw conclusions by comparing the data.

Interpretation:

Interpretation is the act of explaining, re-framing or otherwise showing your own understanding of something.

Different method in which data can be presented

a) Tables:

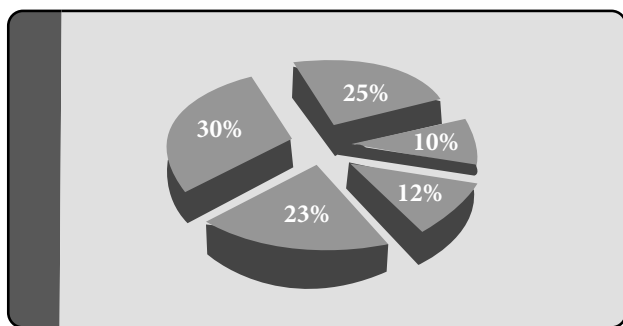
Tables are the most convenient and versatile method to present data. Analysing and drawing conclusions from tables is much easier than any other method. Tables are the fundamental method to represent data. In tables, the data is arranged in rows and columns which help us to scrutinize data efficiently.

Standard	Boys	Girls
1	32	26
2	24	28

b) Pie chart:

A Pie chart is a pictorial representation of data as part of a circle. The circle presents the total value and the different parts of the circle present certain portions of the data.

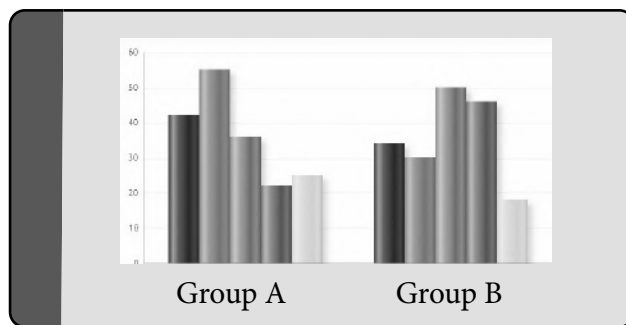
There are two types of pie chart: Normal and Exploded



c) Graphs:

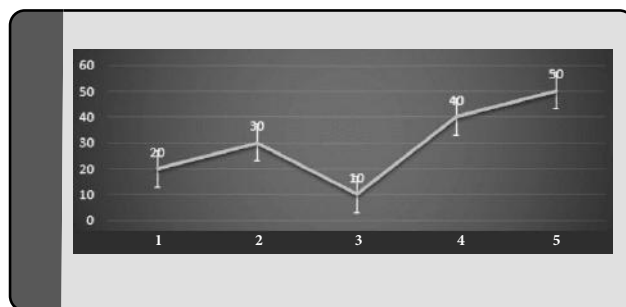
Bar graph:

A bar graph is a way of representing data on the graph using X-axis and Y-axis. It is the most convenient way to present data. It is proven that using lengths in case of bar chart is a better indicator than pie charts where the data is categorized in terms of areas.



Line graph:

Line graph is the simplified version of the normal bar graph. It is simple to draw conclusions from Line Graph.



Various concepts required to solve questions on data interpretation

$$\text{Average} = (\text{Sum of all the values}) / \text{no. of values}$$

Ratio = Comparison of like terms in its simplest forms

Percentage

x is what percentage of y = $x/y \times 100$

x is what percentage more (or) less than

y = $(x - y) / y \times 100$

Percentage change = $\frac{(\text{Final value} - \text{Initial value})}{\text{Initial value}} \times 100$

Tricks to solve data interpretation questions

1) Analyze the Data Carefully- Have a thorough look at the data given. Analyze the data. You will waste a lot of time if you jump on the questions to find answers directly. Look carefully at the labels, understand the graph, scrutinize the data very carefully.

2) Read the question carefully- Before rushing over the Data Interpretation question, stay calm and read

the question carefully. In data interpretation, it is important to understand the question in order to solve the question.

3) Avoid Unnecessary Calculations- We are taught to solve questions step by step. But in National Eligibility Test, time plays an important role, it is better to avoid unnecessary steps and solve using short cuts.

4) Pay close attention to the units used- In Data Interpretation Question at times the different unit is used for the question and another unit in the data. For example, a question may talk about two units. The time of the first unit is in hours and the second unit is in minutes. Always convert the units into the ones which is required. So, if the question asks how many minutes it will take, convert the data from hours to minutes.

5) Learn to Approximate the values- You need not to find the exact answer always. Many times, the options that are given are far enough from each other which gives you enough space for approximation. So, for example, if you are asked to divide 542678/181234, you can easily approximate that the answer will be somewhere around 3 by looking at the first 2 digits only. 54/18 is 3.

Level-1

Solved Question with Explanation

1.1. Directions (1-5)

Study the table given below to answer these questions. Indicators of Human development for some Asian Countries – 2017

Country	Life Expectancy At birth	Infant Mortality rate (per thousand births)	Adult Literacy rate (per cent)
India	62.4	71	62
Bangladesh	58.1	81	39
China	69.8	38	83
Indonesia	65.1	45	85
Korea Republic	72.4	6	97
Malaysia	72.0	10	86
Pakistan	64.0	95	41
The Philippines	68.3	32	95

- India ranks in adult Literacy among the countries listed as per the 2017 data given
a) Sixth b) Fifth c) Third d) Fourth

Answer: a

Adult literacy

Korean republic	-97%-1st
Philippines	-95%-2nd
Malaysia	-86%-3rd
Indonesia	-85%-4th
China	-83%-5th
India	-62%-6th

- Infant mortality rate is highest in
a) India b) Pakistan
c) Korea Republic d) China

Answer: b

Pakistan hold first position with 95 death per thousand birth

- Life expectancy at birth is highest in
a) Korea Republic b) Malaysia
c) India d) Philippines

Answer: a

The life expectancy in Korea Republic is 72.4, the highest.

- How many countries having 70% and above adult literacy rate
a) 3 b) 4 c) 5 d) 6

Answer: c

Korea Republic, Philippines, Malaysia, Indonesia, China are the 5 countries having 70% and above adult literacy rate.

- What is the ratio between Korea Republic and Malaysia in infant mortality rate?
a) 3: 9 b) 3: 5 c) 9: 19 d) 1: 2

Answer: b

Korea Republic : Malaysia = 6 : 10 = 3 : 5

1.2. Directions (6-10)

Study the following table to answer the given questions: Percentage of marks obtained by seven students in six subjects

Subject (Max, Marks)	Eng.	His	Com	Math	Science	Econ
Students (100)	(100)	(100)	(100)	(100)	(100)	(100)
Meera	100	70	50	50	90	60
Subodh	80	80	80	100	80	40

Kunal	100	80	60	90	70	80
Soni	60	70	65	80	80	80
Richu	50	90	62	80	100	100
Irene	40	70	64	70	65	85
Vijay	80	100	35	65	50	75

6. What is the total marks obtained by Meera in all the subject?
 a) 448 b) 580 c) 420 d) 474

Answer: c

$$100+70+50+50+90+60=420$$

7. What is the average marks obtained by these seven students in History? (rounded off to two digits)
 a) 72 b) 73 c) 86 d) 80

Answer: d

$$(70+80+80+70+90+70+100)/7=560/7=80$$

8. How many students have got 60% or more marks in all the subjects?
 a) One b) Two c) Three d) Four

Answer: b

Soni & Kunal secured above 60% in all subject.

9. What is the overall percentage of Kunal ?
 a) 64 b) 65 c) 75 d) 80

Answer: d

$$(100+80+60+90+70+80)/6=480/6=80$$

10. In which subject richu secured the best?
 a) Maths b) Commerce
 c) History d) Science.

Answer: d

Richu secured 100 marks in Science

Practice Question

1.3 Directions (11–15)

Study the following table carefully and answer the given questions

The table shows four different student marks in 10th STD in five different Subjects.

Student Name	Tamil (100)	English (100)	Maths (100)	Science (100)	Social Science (100)
Edwin	80	70	96	85	64
Giri	55	60	70	40	65
Raj	35	45	60	50	55
Subbu	85	65	75	76	54

11. Find the average mark of Edwin?
 a) 90 b) 79 c) 60 d) 69
12. What is the ratio of Giri's Maths marks to that Subbu English mark?
 a) 13:14 b) 14:13 c) 15:16 d) 14: 15
13. What is the difference between of Edwin and Raj in total marks?
 a) 150 b) 120 c) 130 d) 200
14. Students who secured 50% below considered to be failed in the examination. How many students are failed in the examination?
 a) 1 b) 4 c) 3 d) 2
15. Find the difference between total mark of Tamil and Social science for all the students?
 a) 27 b) 37 c) 17 d) 7

1.4 Directions (16–20)

Study the following information carefully and answer the given questions. The Table, given here, shows the number of tickets sold by 6 students A, B, C, D, E and F during a fair. Observe the table and answer questions based on it.

Students	A	B	C	D	E	F
Tickets	16	8	20	7	24	14

16. Total number of tickets sold by A, B and C is
 a) 45 b) 44 c) 42 d) 40
17. The least number of tickets were sold by
 a) B b) F c) A d) D
18. Total number of tickets sold by D, E and F is
 a) 47 b) 46 c) 45 d) 44
19. The difference between tickets sold by E and F ?
 a) 10 b) 20 c) 15 d) 38
20. The ratio between tickets sold by A and B ?
 a) 2 : 3 b) 4 : 2 c) 1 : 2 d) 2 : 4

1.5 Directions (21–25)

Study the following table carefully and answer the given questions. Profit of Company X In the year 1997, 1998, 1999, 2000 as Quarters.

	1997	1998	1999	2000
Quarter 1	135	65	120	150
Quarter 2	115	75	160	180
Quarter 3	90	100	170	210
Quarter 4	70	120	190	230

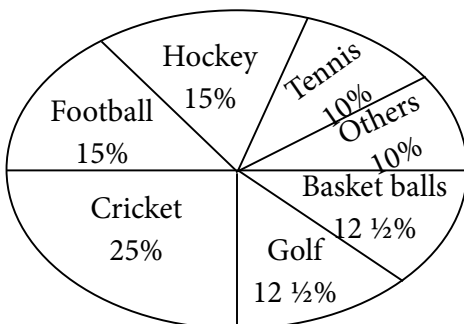
Profit of E-commerce sites in india (in million)			
Months	Jan	Feb	March
Amazon	360	350	400
Flipkart	320	300	280
Snapdeal	150	120	180
India mart	270	230	130
Myntra	120	80	70

Data Interpretation

- What is the total profit of Snapdeal in all the given months together?
 a) 450 b) 300 c) 400 d) 380
 Answer: a
 $150+120+180=450$
- Find the difference between profit of amazon in the January month and profit of flipkart in February month?
 a) 30 b) 60 c) 70 d) 80
 Answer: b
 $360-300=60$
- Find the average profit of India mart e-commerce?
 a) 400 b) 300 c) 210 d) 410
 Answer: c
 $(270+230+130)/3= 630/3=210$
- What is the total profit earned by flipkart in march and Myntra in march together?
 a) 270 b) 250 c) 300 d) 350
 Answer: d
 $280+70=350$
- The profit earned by snapdeal in the month of January is approximately, what percentage of the profit earned by flipkart in the month of February?
 a) 50% b) 60% c) 70% d) 80%
 Answer: a
 $(300-150)/300 \times 100 = 150/300 \times 100 = 50\%$

2.2 Directions (6-10)

Study the following Pie Chart and answer the question. The data Shows Expenditure on Sports.



- The ratio of the total expenditure on football to that of expenditure on hockey is:
 a) 1:15 b) 1:1 c) 15:1 d) 3:20
 Answer: b
 Food ball : Hockey = 15 : 15 = 1 : 1
- If the total expenditure on sports during the year was Rs. 1,20,000,00 how much was spent on basket ball?
 a) Rs. 9,50,000 b) Rs. 10,00,000
 c) Rs. 12,00,000 d) Rs. 15,00,000
 Answer: d
 Total expenditure (100%) = 1,20,000,00
 Expenditure on basket ball (12.5%) = x
 $x = (1,20,000,00 \times 12.5) / 100 = 15,000,00$
 Short cut:
 100% = 1,20,000,00
 10% = 12,00,000
 2.5% = 15,00,000
- The chart shows that the most popular game of the country is :
 a) Hockey b) Football
 c) Cricket d) Tennis
 Answer: c
 As the expenditure on cricket is highest than the rest, then it shows that cricket is a most popular game of a country.
- Out of the following country's expenditure is the same on :
 a) Hockey and Tennis
 b) Golf and Basket ball
 c) Cricket and Football
 d) Hockey and Golf
 Answer: b
 Expenditure on Golf = 12.5% = Expenditure on Basket ball
- If the total expenditure on sport during the year was Rs. 1,50,00,000 the expenditure on cricket and hockey together was:
 a) Rs. 60,00,000 b) Rs. 50,00,000
 c) Rs. 37,50,000 d) Rs. 25,00,000
 Answer: a
 Total expenditure = 1,50,000,00
 (Cricket + Hockey) Together =
 $1,50,000,00 \times 40\% = 60,000,00$
 $25\% + 15\% = 40\%$

Let, x be 40%
 $x = 40\%$
 $x = (40 \times 1,50,000,00) / 100 = 60,000,00$
 Short cut :
 $100\% = 1,50,000,00$
 $10\% = 15,00,000$
 $40\% = 60,00,000$

Practice Question

2.3 Directions (11-15)

Study the following table and answer the following questions given.

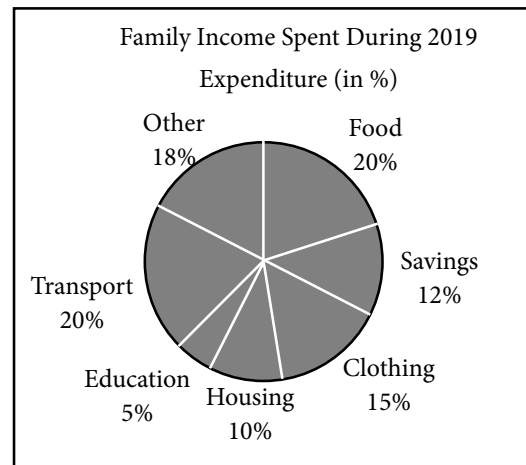
The table shows about number of people using Vodafone, Jio, Airtel service centre..(in thousands)

Year	Vodafone	Jio	Airtel
2014	15	25	10
2015	15	10	15
2016	10	25	20
2017	10	20	15
2018	40	25	25
2019	15	15	25

- What is the average number of people using mobile service of Jio all year's together?
 a) 16,000 b) 18,000
 c) 20,000 d) None of these
- The total number of people using all 3 service centre in 2017 is what percent of total number of people using these service centre in 2018?
 a) 50% b) 67% c) 66% d) 59%
- The number of people using of Vodafone in 2016, 2015 and 2014 together?
 a) 40,000 b) 30,000
 c) 20,000 d) None of these
- What is the ratio of Airtel service centre in the year 2015 to the year 2014?
 a) 2:3 b) 4:2 c) 3:2 d) 2:4
- The total number of people using Jio service centre in 2019 and the previous year is equal to?
 a) 32000 b) 50000
 c) 44000 d) 40000

2.4 Directions (16 – 20)

The Pie-Chart given below shows the expenditure of a family income on various items and savings during 2019. Observe the graph and answer the following questions:



- The percent of income spent on food and clothing is:
 a) 5 % b) 30% c) 12% d) 35 %
- The percent of income spent on clothing exceeds that on savings by:
 a) 3% b) 2.5% c) 10% d) 22.5%
- If the total income of the family during 2019 was Rs. 100000, the savings of the family in 2019 was:
 a) Rs. 1,750 b)Rs. 20,000
 c) Rs. 12,000 d) Rs. 50,000
- The total expenses of the family on transport is equal to those spent on:
 a) Savings b) clothing
 c) food d) others
- The savings of the family is more than that of expenditure incurred on:
 a) Housing b) clothing
 c) transport d) others

2.5 Directions (21-25)

Study the following table carefully and answer the questions given below.

Amount invested by six different companies during six different months (in lakhs)

Company	A	B	C	D	E	F
JAN	25	28	50	32	24	35
FEB	45	40	60	55	28	38
MAR	52	38	46	72	83	65
APR	80	45	70	90	65	76
MAY	15	20	47	25	13	30
JUN	62	95	27	80	50	20

21. What is the difference between the investment made by company A and E together in March and company B and D together in January (in lakh)?
 a) 75 b) 65 c) 50 d) 85
22. What is the average of investment made by company C in May, D in February and E in January (in lakhs)?
 a) 22 b) 36 c) 42 d) 46
23. In which month was the investment made by companies maximum?
 a) March b) April c) May d) June
24. What is the total investment made by company A in all the months together ?
 a) 300 b) 279 c) 340 d) 230
25. What was the average investment made by company F during all the months (in lakhs)?
 a) 34 b) 43 c) 32 d) 44

Answer Key with Explanation

11. Answer: c
 $(25,000+10,000+25,000+20,000+25,000+15,000)/6=120/6$
 $= 20,000$
12. Answer: a
 Total no.of person using all 3 services in 2017= $10+20+15=45$
 Total no.of person using all 3 services in 2018= $40+25+25=90$
 $(45/90) \times 100= 50\%$
13. Answer: a
 Total no.of person using vodafone in 2014, 2015, 2016= $10,000+15,000+15,000 = 40,000$
14. Answer: c
 Ratio => Airtel 2015 : Airtel 2014= 15: 10=3: 2
15. Answer: d
 Total no.of person using jio service centre in 2018 & 2019 is $25,000+ 15,000 =40,000$
16. Answer: d
 Percentage of income spent on food and clothing is $20\%+15\%=35\%$
17. Answer: a
 Percentage of income spent on clothing = 15%
 Percentage of income spent on saving = 12%
 $15\% - 12\% = 3\%$
18. Answer: c

Total income of family in 2019 = 1,00,000
 $100\% = 1,00,000$
 The savings of family = 12%
 Let, x = 12%
 $X = (1,00,000 \times 12) / 100 = 12,000$

19. Answer: c
 Total expenses on transport = 20%
 = Total expenses on food
20. Answer: a
 The saving of family is 12% housing, which is 10%
21. Answer: a
 Investment made by A and E in March
 $= 52 + 83 = 135$
 Investment made by B and D in January
 $= 28 + 32 = 60$
 Hence, required difference = $135 - 60 = 75$
22. Answer: c
 Required average = $(47 + 55 + 24)/3$
 $= 126/3 = 42$ lakhs
23. Answer: b
 The total investment of companies,
 In January = $25 + 28 + 50 + 32 + 24 + 35 = 194$ lakh
 In February = $45 + 40 + 60 + 55 + 28 + 38 = 266$ lakh
 In March = $52 + 38 + 46 + 72 + 83 + 65 = 356$ lakh
 In April = $80 + 45 + 70 + 90 + 65 + 76 = 426$ lakh
 In May = $15 + 20 + 47 + 25 + 13 + 30 = 150$ lakh
 In June = $62 + 95 + 27 + 80 + 50 + 20 = 334$ lakh
 Hence, April month has the maximum investments
24. Answer: b
 Total investment made by company A = $25 + 45 + 52 + 80 + 15 + 62 = 279$
25. Answer: d
 Required average
 $= (35 + 38 + 65 + 76 + 30 + 20)/6=264/6=44$

Level-3

Solved Question with Explanation

3.1 Directions (1 - 5)

The Pie-Chart given below shows the spending of a family income on various items and savings during 2019. Observe the pie chart and answer the following questions:

Note – Income of a family is 2,00,000.

Why does NTA NET demand aspirants to learn Reading Comprehension?

Reading comprehension (RC) is the ability to actively read the information (passage), process the text, understand its meaning, and integrate the message. Reading comprehension is one of the most important topics which commonly appear in the verbal ability section of almost all qualifying exams and competitive exams. The purpose of the reading comprehension is to evaluate the candidate's ability to read and comprehend the passage.

It involves the process such as reading the passage, grasps the main content of the passage, understands the opinion of the author, assimilate the information, connect the ideas of passage, comprehend the passage and bringing the inference out of it. Focus is the key skill that is required for an aspirant to finish Reading comprehension quickly. By practising the reading comprehension, one can build their concentration.

The comprehension for paper 1 is generally based on a piece of recent news or topics related to any other sphere of life. However, it is essential to note that even if the candidate has a wider idea of the topic, his/her answers should only be based on the information mentioned in the passage. The comprehension for paper 2 is generally based on the core subject topic.

Reading comprehension is much more important regarding the NTA NET exam because it covers up to 30 marks out of 300 marks (total marks of the exam), that is 10% of the total marks. These 30 marks are made from both the papers that are paper 1 (10 marks) and paper 2 (20 marks). Though in paper 2 the format of the question does not resemble the same as reading comprehension for some of the core subjects, some set of comprehension skills are also required to secure 20 marks in paper 2. So, it is important for the candidate to understand this reading comprehension unit as an easy scoring point.

Syllabus

Comprehension

A passage of text will be given. Questions will be asked from the passage to be answered.

Trend Analysis

To understand about reading comprehension of NET, one has to understand the difference between the NET exam and the other competitive exams. Unlike other exams, NET does not demand the aspirants to have to have to have a sound vocabulary. Instead, it clearly demands the aspirants to have skill focus, concentration, making conclusion from the given passage. Reading comprehension of NET exam portrays a single paragraph of about 15 lines only, whereas

reading comprehension of other competitive exam would be about three to four paragraphs, each having at least 15 to 20 lines. In the context of the NET exam, the answers to all the questions of Reading comprehension are strategically hidden in the passage itself, and candidates can easily answer these questions correctly if they appear for the exam with a stress-free mind set and have practised enough. Practising each day, reading comprehension, is a key to score marks.

The changing pattern of reading comprehension is analysed from the recent exams held. It is noticed that, the reading comprehension passage tends to shift from inferential level to analytical level.

Blueprint of Reading comprehension unit

Dear Aspirants, this blue print will help you get an idea about different levels of difficulty in reading comprehension and also fetch confidence by practising them in an orderly sequence. In Professor Academy blueprint the reading comprehension has been classified into 5 levels, as follows.

Level 1- This level is a basic level; this will help you to get the basic idea and literal meaning of the passage. Literal meaning is simply what the text says. Here are examples of the type of information that could be identified as a literal meaning

The main idea, Stated facts, The sequence of events, Characters in the story

Level 2- This level wants you to think little for answering the questions by getting inference from the passage. Inferential meaning involves determining what the text means. Here are examples of the type of information that could be identified as inferential meaning.

Generalizations, cause and effect relationships, future predictions, an unstated main idea.

Level 3- This level requires the candidate to assess (Evaluate) the passage with a reflective sphere of knowledge. Evaluative meaning is what the text is telling us about the world outside the story. Here are examples of the type of information that could be identified as evaluating meaning.

Choosing an alphabetical statement, giving a solution to a situation-based problem and suggestion idea/opinion.

Level 4 and Level 5 are the advanced level which develops vocabulary skills, art of drawing indirect inferences, application- oriented questions, making judgments.

Make use of all the passages and score the fullest in the exam!

ALL THE BEST!

So what exactly is a Reading Comprehension?

Reading Comprehension is the way of understanding what is being read. In simple words, reading comprehension means a passage which is to be read and comprehended. What makes comprehension passages a nightmare for students is the diverse range of topics that are covered, the vocabulary used in the passage and the time limit given in the exam.

Different types of area/ topics for reading comprehensions:

1. Social Sciences – History, anthropology, sociology, government.
2. Natural Sciences – Biology, Environment, Space technology, Astronomy.
3. Humanities – Art, Music, Literature, Philosophy
4. Business – Economics, Marketing, Human Resources.

Different types of questions which come in Reading comprehension:

- Factual - these questions are based on the facts given in the passage.
- Main idea - in these questions we have to tell the main idea or the central theme of the passage.
- Title- the title of the passage is linked directly to the main idea of the passage.
- Inference - these questions are based on the inference of the entire passage.
- Tone - in tone-based questions we have to deduce the tone of the passage.

Reading comprehension is so important because:

- RCs test a student on a number of skills, including English comprehension and logical ability, language skills such as reading and vocabulary.
- As we discussed earlier RCs are generally based on a variety of topics, covering science, business, philosophy, sociology and so on. Such a vast breadth of topics means that one needs to read regularly and diversely in order to make sure that one is comfortable reading every kind of passage.
- These passages are generally based on unique questions and some of the question are inferential in nature.

1. First of all have a quick but sharp glance of the questions,

- ‘What’ type
- ‘How’ type
- Refers to a particular word
- Actual data as such
- Interpretative

2. Read the passage

- Find out the overall tone by understanding
- Starting note (find – whether the Author Starts in a Positive Tone or Negative Tone)
- Ending note (find – whether the Author Starts in a Positive Tone or Negative Tone)
- Understand the transition from the First line till the Last line
- Get to know - what does the author mean to say (conclusion)?
- If a particular word is unknown, we could make educated guess if the overall meaning is clear enough.

3. Understand the passage

- Always go for the big picture of what is being told actually.
- DO NOT SKIM the Content.
- READ the Passage FULLY.
- RC demands presence of mind, high focus and precise interpretation skills- a appealing essential for an academician to understand the subject.

Level 1

1.1 Directions (1-5) Read the Passage and Answer the following Questions.

Once upon a time Shree Krishna and Arjun went for a short stroll around the city. They saw a poor looking priest begging. Arjun felt pity for him and he gave him a bag full of 100 gold coins. The priest became very happy and thanked Arjun. He left for his home. On way, he saw another person who needed help. The priest could have spared a coin or two to help that person. However, he chose to ignore it. But on way to his home, one thief robbed him of his bag of coins and ran away.

The priest became dejected and went back again for begging. Next day again when Arjun saw the same priest begging and he was surprised that after getting a bag full of coins which can last a lifetime, the priest was still begging! He called the priest and asked him the reason for this. The priest told him about the whole incident and Arjun again felt pity at him. So, this time he gave him a diamond.

The priest became very happy and left for home and he again saw someone who needed help but he chose to ignore again. Upon reaching home, he safely put the diamond in an empty pot of water with a plan to cash it out later and live a wealthy life. His wife was not at home. He was very tired so he decided to take a nap. In between, his wife came home and picked up that empty pot of water, walked towards the river close by to fill up the water. She had not noticed the diamond in the pot. Upon arriving at the river, she put the whole pot into the running river water to fill it up. She filled up the pot but the diamond was gone with the water flow!

When the priest woke up, he went to see the pot and asked his wife about the diamond. She told him, she had not noticed it and it must have been lost in the river. The priest couldn't believe his bad luck and again started begging. Again Arjun and Shree Krishna saw him begging and Arjun inquired about it. Arjun felt bad and started thinking if this priest will ever have a happy life.

Shree Krishna who is an incarnation of God smiled. Shree Krishna gave that priest one coin which was not even enough for buying a lunch or dinner for one person. Arjun asked Shree Krishna, "Lord, I gave him gold coins and diamond, which could have given him a wealthy life, yet it didn't help him. How will just one coin help this poor guy?" Shree Krishna smiled and told Arjun to follow that priest and find out.

On the way, the priest was thinking that one coin Shree Krishna gave him, he can't even buy a lunch for one person. Why would he give so little? He saw a fisherman who was getting a fish out of his net. Fish was struggling. The priest felt pity at fish. He thought that this one coin won't solve my problem, why not I save that fish. So the priest paid the fisherman and took the fish. He put the fish in his small pot of water which he always carried with him.

The fish was struggling in a small pot of water, ended up throwing out a diamond from the mouth! The priest screamed with a joy, "I got it, I got it". At that same point, the thief who had robbed the priest's bag of 100 gold coins, was passing through there. He thought that the priest recognized him and may get him punished. He got nervous and ran to the priest. He apologized to the priest and returned his bag full of 100 gold coins. The priest couldn't believe what just happened. Arjun saw all this and said, "Oh Lord, Now I understand your play".

Questions

- What is the moral of the story?
 - One day you will get everything, so do not lose hope.
 - When you have enough to help others, don't let that chance go.
 - Your good deeds will always be repaid to you.
 - You cannot get enough if you have bad luck.
 - Only a
 - Both b and c
 - Only b
 - Only c
- What is the meaning of "The priest could have spared a coin or two to help that person"?
 - The priest could have thanked the person by giving him one or two coins.
 - The priest could have given some coins to help the needy person.
 - The priest did not give any coin to the poor person.
 - The poor person asked for one or two coins but the priest did not help him.
- Which of the following statements is correct?
 - Arjun felt pity at priest when he saw him begging again.
 - Arjun who is an incarnation of God smiled.
 - The priest kept coin of bags in empty pot of water.
 - As opposed to first two times, the priest offered his help third time.
- Why did the priest screamed with joy?
 - He recognized the thief who stole his bag of coins.
 - He was happy to save the life of the fish.
 - He got the lost diamond
 - He found his stolen bag of coins.
- Why did the priest help the fish?
 - He realized his mistake of not helping others for the first two times.

- b) The coin given to him by Krishna was of no use to him.
- c) He was unable to buy even a single meal with that coin.
- d) He felt pity at fish and realized that the coin, that could not solve his problem, can save fish.

1.1 Answer key

1	2	3	4	5
b	b	a	c	d

1.2 Directions(6-10) Read the Passage and Answer the following Questions.

The best definition of Sustainable development was presented by the report Our Common Future (also known as the Brundtland Report): "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Sustainable development is thus the ability to meet the needs of the present while contributing to the future generations' needs. It focuses on two goals: To improve the quality of life for all of the Earth's citizens. To stop using up the natural resources beyond the capacity of the environment to supply them indefinitely. Green development is generally differentiated from sustainable development in that Green development prioritizes what its proponents consider to be environmental sustainability over economic and cultural considerations. In addition to that, sustainable development has underlying concepts: the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs. There is an additional focus on the present generations' responsibility to improve the future generations' life by restoring the previous ecosystem damage and resisting to contribute to further ecosystem damage. Sustainable development requires action on the part of world states, governments and people. The detrimental situation of the environment, the enormous stress upon our natural resources and the huge gap between developed and underdeveloped countries, necessitate practical strategies to reverse the trends.

The World Commission on Environment and Development suggested seven critical objectives for environment and development policies that follow from the concept of sustainable development: Reviving growth, Changing the quality of growth, Meeting essential needs and aspirations for jobs, food, energy, water and sanitation, Ensuring a sustainable level of population, Conserving and enhancing the resource base, Reorienting technology and manage risk, Including and combining environment and economics considerations in decision-making.

Questions

6. The definition for "sustainable development" was presented by
 - a) Rio Summit
 - b) United Nation development programme
 - c) Sustainable development goals
 - d) Brutland Report
7. _____ prirotizes, its proponents considered to be environmental sustainability over economic and cultural considerations.
 - a) Sustainable development
 - b) Millennium development
 - c) Green development
 - d) None
8. The sustainable development underlying the "concept of needs" in addition to
 - a) Priority of rich
 - b) Limitation of Technology
 - c) Ability to meet present and future needs
 - d) Imbalance in ecosystem
9. Which of the following one objectives for environment policies by world commission on environment.
 - a) Reviving growth
 - b) Ensuring the sustainable level of population
 - c) Detrimental situation of environment
 - d) Both (a) and (b)
10. The huge gap between the developed and undeveloped countries, necessitate
 - a) Enormous stress on natural resources
 - b) Re-orienting Technology
 - c) Practical strategy to reverse the trends
 - d) Changing quality of growth

6	7	8	9	10
d	c	c	d	c

1.3 Directions (11-15) Read the Passage and Answer the following Questions.

India is a land of ancient civilization. India's social, economic, and cultural configurations are the products of a long process of regional expansion. Indian history begins with the birth of the Indus Valley Civilization and the coming of the Aryans. These two phases are usually described as the preVedic and Vedic age. Hinduism arose in the Vedic period.

The fifth century saw the unification of India under Ashoka, who had converted to Buddhism, and it is in his reign that Buddhism spread in many parts of Asia. In the eighth century Islam came to India for the first time and by the eleventh century had firmly established itself in India as a political force. It resulted into the formation of the Delhi Sultanate, which was finally succeeded by the Mughal Empire, under which India once again achieved a large measure of political unity.

It was in the 17th century that the Europeans came to India. This coincided with the disintegration of the Mughal Empire, paving the way for regional states. In the contest for supremacy, the English emerged 'victors'. The Rebellion of 1857-58, which sought to restore Indian supremacy, was crushed; and with the subsequent crowning of Victoria as Empress of India, the incorporation of India into the empire was complete. It was followed by India's struggle for independence, which we got in the year 1947.

India is one of the world's oldest civilizations and one of the most populated countries in the world. The Indian culture, often labeled as an amalgamation of several various goolscultures, spans across the Indian subcontinent and has been influenced and shaped by a history that is several thousand years old. Throughout the history of India, Indian culture has been heavily influenced by Dharmic religions. They have been credited with shaping much of Indian philosophy, literature, architecture, art and music. Greater India was the historical extent of Indian culture beyond the Indian subcontinent.

This particularly concerns the spread of Hinduism, Buddhism, architecture, administration and writing system from India to other parts of Asia through the Silk Road by the travellers and maritime traders during the early centuries of the Common Era. To the west, Greater India overlaps with Greater

Persia in the Hindu Kush and Pamir Mountains. Over the centuries, there has been significant fusion of cultures between Buddhists, Hindus, Muslims (Sunni, Shia, Sufi), Jains, Sikhs and various tribal populations in India.

Questions

11. Indian History begins with the birth of
 - a) Indus valley civilization
 - b) Pre vedic age
 - c) Buddhism
 - d) Both (a) and (b)
12. Who emphasized spread of Buddhism under his reign?
 - a) Ashoka
 - b) Mahavir
 - c) Chanakya
 - d) Humayun
13. The Rebellion which sought to restore Indian supremacy has occurred on
 - a) 1857
 - b) 1859
 - c) 1860
 - d) 1856
14. Throughout the history of India, Indian culture has been heavily influenced by
 - a) Buddhism
 - b) Dharmic religions
 - c) Mughal dynasty
 - d) None
15. What is the concern for spread of Hinduism, architecture from India to other parts of Asia
 - a) Amalgamation of various gools culture
 - b) Silk Road
 - c) Dharmic Religions
 - d) None

11	12	13	14	15
d	a	a	b	a

1.4 Directions (16-20) Read the Passage and Answer the following Questions.

Once upon a time two brothers who lived on adjoining farms fell into conflict. It was the first serious rift in 40 years of farming side by side. They had been sharing machinery, trading a labour and goods as needed without a hitch. Then the long collaboration fell apart. It began with a small misunderstanding and it grew into a major difference which exploded into an exchange of bitter words followed by weeks of silence.

One morning there was a knock on elder brother's door. He opened it to find a man with a carpenter's toolbox. "I am looking for a few days of work", he said. "Perhaps you would have a few small jobs here and there. Could I help you?"

Why does NET exam demand Aspirants to learn Information and Communication Technology?

ICT is a scientific, technological and engineering discipline and management technique used in handling information, its application and association with social economic and cultural matters. ICT which is now broadly used in educational world, teacher/students and research scholars popularly use ICT. Every aspects of life are related to science and Technology. Huge flow of information is emerging in all fields throughout the world. Teachers are the core of any living society. Technologies play a vital role in teaching and learning process. This unit of book is a complete package of basics of ICT that would help to gain knowledge about almost all terminology of ICT.

Syllabus

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

Trend Analysis

There is a noticeable shift from direct questions i.e., factual questions to application questions. The application-oriented questions are that which means assertion and reasoning questions, statement-based questions that require candidates to work on each statement to find whether it is true or not. Though the questions seem to be formulated out of basic concepts such as memory, storage, etc., the structure of the question demands you to work on the question to pick your answer from various code. Hence, the aspirants are expected to have complete knowledge about ICT as an extensional term for information technology (IT) that stresses the roll of unified communication and the integration of telecommunications (telephone lines

and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems which enable to access store, transmit and manipulate information. Dear aspirants gaining depth knowledge about basics of computer as well as understanding all the terminology related to current technology and its specifications is very important to score more marks in this subject.

Blueprint of Information and Communication Technology (ICT)

In this unit we have compiled all the important terms from A-Z that are relevant for ICT, acronyms abbreviations, Internet network-based terminologies, list of email acronyms etc, On analyzing questions of recent exams and also from previous exams, the module wise book back questions are discussed. The complete ICT content has been divided into several modules in accordance with the syllabus and the modules are as following:

- Computer and its types
- Components of Computer
- Computer Memory
- Software
- Data and Information
- Number System
- Internet
- Email
- Audio File Formats, Audio Video Conferencing
- E-Governance, E-Commerce
- Abbreviations and Terminology

After each module level 1 questions which are memory-based questions assessing recollecting ability of the aspirants and level 2 questions which are application-based questions assessing the conceptual understanding of the aspirants has been given with the answer key, which the candidate can practice to bench mark their preparation.

LET'S LEARN TECHNOLOGY!

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

Information and communication technology is defined as the use of hardware and software for efficient management of information i.e. storage, retrieval, processing, communication, diffusion and sharing of information for social, economic and cultural improvement. In a broader sense, ICT is considered as the whole set of enabled technology concerned with study, communication, design, development, support or management of computer based information system, particularly software application and computer hardware, networking, data storage, transmission encompassing data, voice and video. Now a days, the education is delivered at doorsteps with the support of ICT aiming at inclusive education.

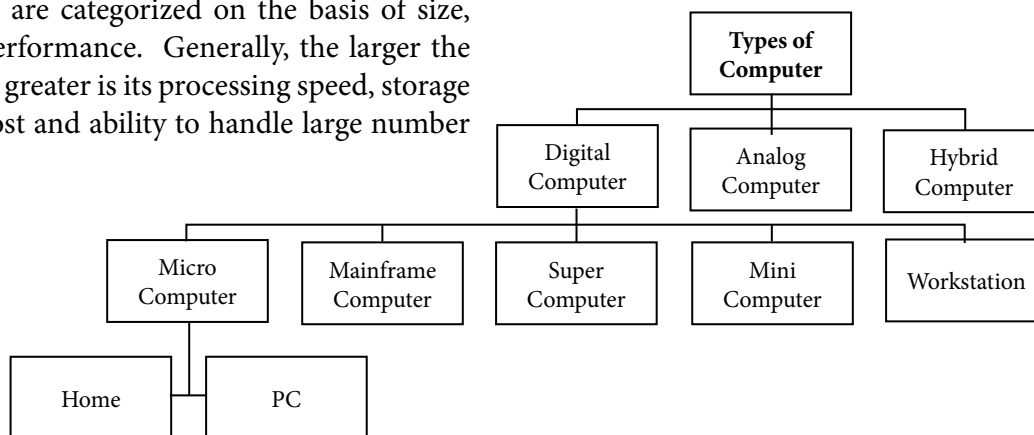
COMPUTER

Computer is a fast operating, automatic electronic device which automatically accepts and store input data, processes them and produces results under the direction of a detailed step by step program. It is used making calculations or controlling operations that are expressible in numerical or logical terms. In other words, a computer has the ability to

- i. Accept data supplied by the user
- ii. Input, store and execute instruction
- iii. Perform mathematical and logical operation
- iv. Give results in accordance with user's requirement

Types/Classification of Computers

Computers are categorized on the basis of size, sort and performance. Generally, the larger the system, the greater is its processing speed, storage capacity, cost and ability to handle large number of devices.



The various types of computers are:

a. Digital Computer

The definition of a digital computer is the most commonly used type of computer and is used to process information with quantities using digits, usually using the binary number system. The Central Processing Unit (CPU) contains an arithmetic and logic unit for manipulating data, a number of registers for storing data, and a control circuit for fetching and executing instructions. The memory unit of a digital computer contains storage for instructions and data. e.g. digital speedometers in mechanical industries.

- i. **Micro Computers:** Systems on the lower end of the size and size scale are microcomputers. They may be tiny, special purpose devices dedicated to carrying out a single task such as one inside a camera. While most PCs are oriented towards single users, mini systems are designed to handle the needs of multiple users. e.g. Personal Computers, Laptops, Tablet PC, Note Pad, Smart Phones.
- ii. **Mainframe Computers:** A mainframe is another form a computer system that is generally more powerful than a typical mini; Mainframes themselves may vary widely in cost and capability. They are used in large organizations for large scale jobs. e.g. ATM machines.
- iii. **Super computer:** A supercomputer is a computer with great speed and memory. They are usually thousands of times faster than ordinary personal computers made at that time. Supercomputers can do arithmetic jobs very fast, so they are used for weather forecasting, code-breaking, genetic analysis and other jobs that need many calculations.

Supercomputers have certain distinguishing features. Unlike conventional computers, they usually have more than one CPU (central processing unit), which contains circuits for interpreting program instructions and executing arithmetic and logic operations in proper sequence. Supercomputers have been used for scientific and engineering applications that must handle very large databases or do a great amount of computation (or both). e.g. weather forecasting, climate research, etc.,.

Characteristics of a Supercomputer

- Powerful funnel capacity-to run few programs as quickly as possible.
- Expensive-Hundreds of millions of dollars.
- Built for specific applications-Animating graphics.
- Made up of tens of thousands of computing nodes.
- Most controlled by Linux software.
- Water cooled.



INTERESTING FACTS!

There are 8 Super Computers: Used by Indian Educational Institutes for their Research under National Super Computing Mission of Government of India

- *Colour Boson (Cray XC-30)*
- *HPC*
- *PARAM Ishan*
- *PARAM Kanchenjunga*
- *PARAM SHIVAY*
- *PARAM YUVA II*
- *Sahasrat (CRAY XC40)*
- *Virgo*

iv. **Mini computers:** Mini computers are small, general purpose computers. They can vary in size from a small desktop model to the size of a small filing cabinet. One and more than one person can work on a mini computer at the same time.

e.g. complex computations in the fields of science and engineering.

v. **Work station** A workstation is a special computer designed for technical or scientific applications.

Intended primarily to be used by one person at a time, they are commonly connected to a local area network and run multi-user operating systems.

b. Analog Computer

An analog computer is a computer which is used to process analog data. Analog computers store data in a continuous form of physical quantities and perform calculations with the help of measures. It is quite different from the digital computer, which makes use of symbolic numbers to represent results. Analog computers are excellent for situations which require data to be measured directly without converting into numerals or codes. Analog computers, although available and used in industrial and scientific applications like control systems and aircraft, have been largely replaced by digital computers due to the wide range of complexities involved. e.g. speedometer, electrical voltage, pressure, temperature.

c. Hybrid Computer

Hybrid computers are well known for their ability to blend analog and digital features of computers. Advantages include the availability of both analog and digital computations within a single unit and an efficient processing speed. A hybrid computer is individually designed and integrated, taking into consideration the field of its application and processing requirements. A hybrid computer is constructed in such a way that its components make the device fast and accurate. e.g. Hospital (in ICU), Petrol Pumps.

Father of Computer

Charles Babbage is considered to be the father of computer, for his invention and the concept of Analytical Engine in 1837. The Analytical Engine contained an Arithmetic Logic Unit (ALU), basic flow control, and integrated memory; which led to the development of first general purpose computer concept.

Generation of computer

SN	Generation	Period	Main Comonent Used	Programming Languages	Merits/Demerits
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The first digital computer

The ENIAC (Electronic Numerical Integrator and Calculator) was invented by J. Presper Eckert and John Mauchly at the University of Pennsylvania and began construction in 1943 and was not completed until 1946. It occupied about 1,800 square feet and used about 18,000 vacuum tubes, weighing almost 50 tons. ENIAC was the first digital computer because it was fully functional.

Sixth Generation Computing

In the Sixth Generation, computers could be defined as the era of intelligent computers, based on Artificial Neural Networks. One of the most dramatic changes in the sixth generation will be the explosive growth of Wide Area Networking. Natural Language Processing (NLP) is a component of Artificial Intelligence (AI). It provides the ability to develop the computer program to understand human language.

Self Evaluation

LEVEL 1

- Which of the following statements is / are True in respect to ICT? [June-2019]
P: ICT is an acronym that stands for information and competitive technology
Q: The effective use of ICT to support learning in the inclusive education exemplifies good teaching for all learners
a) P only
b) Both P and Q
c) Q only
d) Neither P nor Q
- Match the following: [June-2019]
Set-I
A. First Generation
B. Second Generation
C. Third Generation
D. Fourth Generation
Set-II
I) Transistor
II) VLSI microprocessor
III) Vacuum Tube
IV) Integrated circuit
Select the correct option from the following:
a) A-III, B-IV, C-I, D-II
b) A-III, B-I, C-IV, D-II
c) A-III, B-I, C-II, D-IV
d) A-I, B-III, C-IV, D-II
- Which of the following is most suitable for being designated as Fourth Generations Language (4GL)
a) ALGOL
b) Java
c) C
d) SQL
- Which of the following is related to National Super Computing Mission of Government of India?
a) Param 8000
b) Param 10000 [Sept-2020]
c) ParamDhavak
d) ParamShivay
- The statement "The study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer Hardware" refers to
a) Information Technology (IT)
b) Information and Communication Technology (ICT)
c) Information and Data Technology (IDT)
d) Artificial Intelligence (AI)

Answer Key

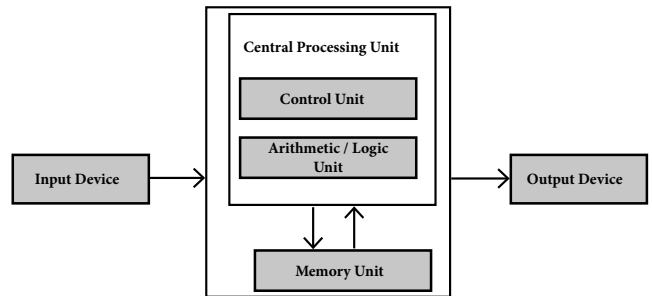
1	2	3	4	5
c	b	d	d	b

LEVEL 2

- Consider the following technologies: [Nov-2020]
(A) Microprocessor (B) Transistor
(C) Vacuum Tube (D) Artificial Intelligence
Arrange the above technologies of different computer generations in the order they have been used. Start from the technology that was used in first generation. Choose the correct answer from the options given below:
a) (C), (A), (B), (D)
b) (C), (B), (A), (D)
c) (B), (C), (A), (D)
d) (C), (B), (D), (A)
- Which of the following statements regarding the features of Information and Communication Technology (ICT) is/are true? [June-2019]
I. ICT are the main instruments for the creation of computer networks and the applications based on them.
II. ICT supports the spread of information and knowledge, separating the content from the place where it belongs physically.
III. The digital and virtual nature of most of ICT products allow the expenditure for them to be maximized.
a) I and II only
b) I and III only
c) II and III only
d) I, II and III

COMPONENTS OF COMPUTER

The computer is the combination of hardware and software. Hardware is the physical component of a computer like motherboard, memory devices, monitor, keyboard etc., while software is the set of programs or instructions. Both hardware and software together make the computer system to function.



Let us first have a look at the functional components of a computer. Every task given to a computer follows an Input- Process- Output Cycle (IPO cycle). It needs certain input, processes that input and produces the desired output. The input unit takes the input, the central processing unit does the processing of data and the output unit produces the output. The memory unit holds the data and instructions during the processing.

Any computer has the following essential components

- (i) Input Unit
- (ii) Central processing Unit (CPU)
 - (a) Arithmetic and Logic Unit
 - (b) Control unit
 - (c) Memory Unit
 - (d) Registers
- (iii) Output Unit

What is Hardware?

Hardware is the equipment involved in the function of a computer. Computer hardware consists of the components that can be physically handled. The function of these components is typically divided into three main categories; input, output, storage. Components in these categories connect to central processing unit (CPU), the electronic circuitry that provides the computational ability and control of the computer, via wires or circuitry called a bus. The main difference between software and hardware can be assumed of their physical appearance as hardware is tangible whereas software is intangible.

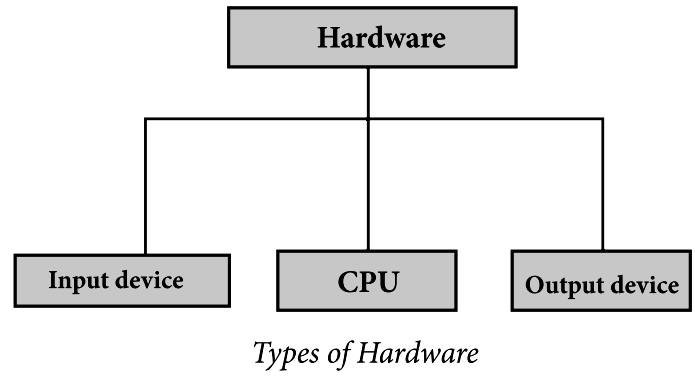
3. Which of the following three statements is/are false?
 P: Second generation Programming languages are COBOL, ALGOL, FORTRAN
 Q: Fifth Generation Programming languages are based on neural networks
 S: Sixth Generation Programming languages are Scripting language.
- a) P Only b) Q Only
 c) S Only d) None Of These
4. Match the following.
- | | |
|--------------------|---------------------------------------|
| 1. Hybrid computer | A. Tiny and special purpose |
| 2. Analog computer | B. Small and general purpose |
| 3. Super computer | C. Genetic analysis and code breaking |
| 4. Mini computer | D. Results in symbolic numbers |
| 5. Micro computer | E. Computation in analog and digital |
- 1 2 3 4 5
- a) E C D B A
 b) E B C D A
 c) E D C A B
 d) E D C B A
5. Given below three statements Choose the correct
- A: Mainframe systems are powerful used in large organization
 B: Workstations commonly connected to a local area network and run multi user operating system, Example- ATM machine
 C: Micro computers are portable and faster built with VLSI which uses 4th generation programming languages.
- a) A, B
 b) B, C
 c) A, C
 d) None Of These

Answer Key










1	2	3	4	5
b	a	c	d	c


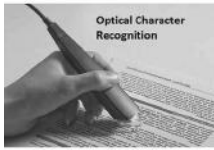


Computer needs certain input, processes that input and produces the desired output. The input unit takes the input, the central processing unit does the processing of data and the output unit produces the required result. The memory unit holds the data and instructions during the processing.

Computer Peripherals: Any device that is attached to the computer is considered a Peripheral. Examples include the printer, monitor and mouse.



Input Devices

S.No	Device Name	Input Device	Description
1	Keyboard		A keyboard is used for entering information into a computer, such as letters, words, numbers and symbols.
2	Mouse		The Mouse is the simplest handheld device used to move a cursor or a pointer across the screen.
3	Joystick		The joystick is used to move (or) controls the pointer on the screen. It can move in all the four directions and enables the user to easily control the cursor movement. It is used mainly for playing games or computer-aided design.
4	Light pen		Light Pen is a light-sensitive device used to draw or write on the screen.
5	Scanner		Scanner reads an image or character from a hard copy document and converts it into a digital file.
6	Track Ball		Trackball or Mouse allows you to move the pointer that is on the screen and to select items by clicking on them.
7	Graphic Tablet		Graphic Tablet is used by the user like a pencil to draw with the help of a stylus on the flat surface and the drawing appears on the computer screen.
8	Touch Screen		Touch Screens are used widely in portable devices such as smart-phones, palmtops, tablets, and laptops to interact with the computer with the help of your fingers or stylus.
9	Micro Phone		Micro Phone is a Device to transfer sound into the computer. The microphones are used for adding sound to the presentation, gaming, chatting, voice recognition, etc.

10	MICR		MICR – Magnetic Ink Character Reader. It can process a large number of cheques within minutes with accuracy and is practically tamperproof. The characters or details on documents that are printed with a special magnetic ink.
11	OCR		OCR – Optical Character Recognition. It is a technology capable of reading handwritten or printed text on documents and converts them into digitized text or electronic files (Pdfs). OCR copies the details using a scanner and the inbuilt software converts the document into a two-color black and white bitmap version.
12	Barcode Reader		Barcode Reader is an automatic input device that uses visible red light to scan or ‘read’ the barcode.
13	WebCam		Webcam is a device that is either connected to the computer by a USB or inbuilt (in laptops) and is capable of taking still picture or motion video of the user or an object in front of it. The photos taken are of the compact digital type which can be uploaded or used over the internet.

Keyboard function keys table:

The keys on the keyboard Functions are

S.No	Keys and Description
1	Typing Keys These keys include the letter keys (A-Z) and digit keys (09).
2	Numeric Keypad These keys are used to enter the numeric data or cursor movement. Generally, it consists of a set of 17 keys that are laid out in the same configuration used by most adding machines and calculators.
3	Function Keys These are twelve function keys are present on the keyboard which are arranged in a row at the top of the keyboard. Each function key has a unique meaning and is used for some specific purpose.
4	Control keys These keys provide cursor and screen control. It includes four directional arrow keys. Control keys also include Home, End, Insert, Delete, Page Up, Page Down, Control (Ctrl), Alternate (Alt), Escape (Esc).
5	Special Purpose Keys These are special purpose keys such as Enter, Shift, Caps Lock, Num Lock, Space bar, Tab, and Print Screen.
6	Navigation Keys A keyboard key used to move the pointer (cursor) around on the screen. They include the four Arrow keys, PageUp, PageDown, Home and End keys.
7	Modifier keys Ctrl, Shift, Alt are the modifier keys

Central Processing Unit

CPU is an electronic circuit that executes computer programs. It is responsible for carrying out arithmetic and logic functions as well as executing instructions to other components. The components of a CPU work together, a depending on how they are made, determine exactly how fast these operations can be carried out along with how complex the operations can be the major component which interprets and executes software instructions. It also controls the operation of all other components such as memory, input and output units. It accepts binary data as input, process the data according to the instructions and provides the result .

The CPU has Three components

1. Arithmetic and Logic Unit (ALU)
2. Control Unit
3. Memory Unit

Arithmetic and Logic Unit

The ALU is a part of the CPU where various computing functions are performed on data. The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations. The result of an operation is stored

in internal memory of CPU. The logical operations of ALU promote the decision-making ability of a computer.

Control Unit

The control unit controls the flow of data between the CPU, memory and I/O devices. It also controls the entire operation of a computer.

Memory Unit

The Memory Unit is of two types which are primary memory and secondary memory. The primary memory is used to temporarily store the programs and data, when the instructions are ready to execute. The secondary memory is used to store the data permanently.

The Primary Memory/ Main memory is volatile, that is the content is lost when the power supply is switched off. The Random Access Memory (RAM) is an example of a main memory. The Secondary memory is non-volatile, that is the content is available even after the power supply is switched off. Hard disk, CD-ROM and DVD ROM are examples of secondary memory.

CPU Clock Measurement

Clock speed is the rate at which a processor can complete a processing cycle. It is typically measured

in Hertz. One megahertz is equal to one million cycles per second, while one gigahertz equals one billion cycles per second.





Motherboard

The Motherboard is simply a flat board having a printed circuit diagram that enables the communication between the CPU, memory, and other components of the computer in addition to being the hub providing connectors for your secondary devices. The components are connected via cables or through expansion cards. It is also called as the main circuit board, system board, baseboard, planar board, and Apple have given the term logic board for the motherboards in their brand of computer. The motherboard is considered as the backbone of the computer and also a board having expansion capabilities for USB, RAM slots and few other custom components.

Peripheral Card

A printed circuit board that plugs into a slot on the motherboard and enables a computer to control a peripheral device. Also called an “interface card,” “adapter” or “controller,” all the printed circuit boards that plug into a computer’s bus are technically expansion cards, because they “expand” the computer’s capability.

Output Devices

S.No	Device Name	Device Image	Description
1	Monitor		Monitor displays information in a pictorial form or commonly referred to as pixels.
2	Printer		Printer produces a hard copy version of the processed data from the computer.
3	Headphones		The headphones are called as earphones. We can listen to audio or watch the video privately without disturbing others.
4	Computer Speaker		The speakers receive audio as an input from the computer or a sound card.

2. Given below are two statements, one is labelled Assertion(A) and the other is labelled as Reason (R)

Assertion(A): The clock speed of CPU has not increased significant in recent years

Reason (R): Software now being used is faster and therefore processors do not have to be faster
In the light on the above two statement choose the correct option from those given below

[Dec- 2019]

- a) Both (A) and (R) are true 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, but (R) is false
- d) (A) is false, but (R) is true

3. Assertion (A): The computer is the combination of hardware and software.

Reason(R): Hardware is the physical component and software is set of information.

Choose the correct answer from the following:

- a) Both (A) and (R) are true and (R) is the correct explanation of (A).
- b) Both (A) and (R) are true and (R) is not the correct explanation of (A).
- c) (A) is true and (R) is false.
- d) (A) is false and (R) is true.

4. Given two statements

I. Hardware is tangible whereas software is intangible.

II. Input and output devices are connected to the computer via wires or circuitry called as topologies.

Which among above statement is correct?

- a) Only I
- b) Only II
- c) Both I & II
- d) None of the above

5. What are the different set of keys available in the keyboard

- (i). Character keys
- (ii). Modifier keys
- (iii). Surrogate keys
- (iv). System keys
- (v). Function keys
- (vi). Navigation keys
- (vii). Symmetric Keys

Choose the correct option

- a) (i), (ii), (iii), (v), (vi)
- b) (i), (ii), (iv), (v), (vi)
- c) (i), (ii), (v), (vi), (vii)
- d) (i), (ii), (iv), (v), (vii)

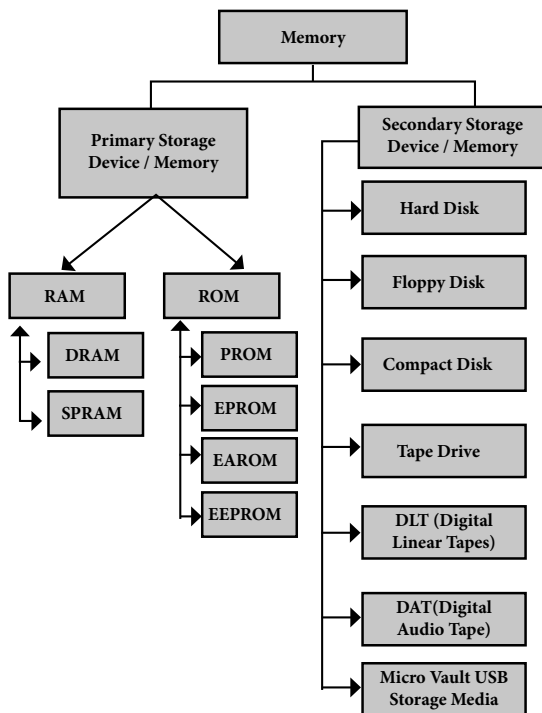
Answer Key

1	2	3	4	5
b	c	c	a	b

COMPUTER MEMORY

The performance of computer mainly based on memory and CPU. Memory is major part of computers that categories into several types, Memory is best storage part to the computers users to save information, programs and etc. The computer memory offer several kinds of storage media some can store data temporarily and some of them can store permanently. Memory consists of instructions and the data saved into computer through Central Processing Unit (CPU).

Primary and secondary storage device



The purpose of the storage unit of the computer is to store the data entered before processing and also to store the results after processing.

Physical devices are used to store programs or data on a temporary or permanent basis for use in a computer.

Memory-Data stored in the form of chips.

Storage-Data stored in tapes or disks.

Storage Unit

1. Primary Storage Device
2. Secondary Storage Device

Memory Storage Units

Bit	0 or 1		
4 Bit	1 Nibble		
8 Bit	1 Byte		
1024 Byte	1 Kilo Byte	2^{10}	10^3
1024 Kilo Byte	1 Mega Byte	2^{20}	10^6
1024 Mega Byte	1 Giga Byte	2^{30}	10^9
1024 Giga Byte	1 Tera Byte	2^{40}	10^{12}
1024 Tera Byte	1 Peta Byte	2^{50}	10^{15}
1024 Peta Byte	1 Exa Byte	2^{60}	10^{18}
1024 Exa Byte	1 Zetta Byte	2^{70}	10^{21}
1024 Zetta Byte	1 Yotta Byte	2^{80}	10^{24}
1024 Yotta Bye	1 Bronto Byte	2^{90}	10^{27}
1024 Bronto Byte	1 Geop Byte	2^{100}	10^{30}

Memory is internal storage media of computer that has several names which is majorly categorized into two types.

1. Primary Memory
 - i. Random Access Memory/Volatile Memory
 - ii. Read Only Memory(BIOS)/Non-Volatile Memory
2. Secondary Memory/ Non-Volatile Memory

Primary Memory

Primary Memory is called as Volatile memory because the memory can't store the data permanently. Primary memory select any part of memory when user want to save the data in memory but that may not be store permanently on that location. It also has another name i.e. RAM.

(i) Random Access Memory (RAM): The primary storage is referred to as random access memory (RAM) due to the random selection of memory locations. It performs both read and writes operations on memory. If power failure occurs in systems during memory access then you will lose your data permanently. So, Ram is volatile memory. RAM is categorized into following types. DRAM, SRAM & DRDRAM.

DRAM (Dynamic RAM): It only holds its data if it is continuously accessed by a refresh circuit. Many hundreds of times each second, this circuitry reads

LEVEL 2

1. Which of the following statements are correct?
 A. NKN stands for New Knowledge Network
 B. MOOCs are offline courses
 C. National Supercomputing Mission is a Government of India initiative
 D. Clock rate of CPU is measured in Gigabytes
 E. ParamShivay is a super computer [Oct-2020]
 a) C and E only b) B and C only
 c) C and D only d) A and E only
2. Identify the correct pair from the following:
 A. AVI – File, Transfer Protocol
 B. Excel – Word Processing Software
 C. HDD – Cloud Storage Faculty
 D. Ubuntu – Operating System
 Choose the correct option [Nov-2020]
 a) A and C Only b) D Only
 c) B and C Only d) None of the above
3. Given below are two statements – one labelled as Assertion (A) and the other labelled as Reason (R)
 Assertion (A) : Information technology is fast becoming a very important field of activity in India
 Reason (R) : Software is one of the major exports of India and further India has a very strong base in Hardware

choose the correct options

[June-2019]

- a) Both (A) and (R) are true 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, but (R) is false
 d) (A) is false, but (R) is true
4. Read the following two statements:
 I: Information and Communication Technology (ICT) is considered a subset of Information Technology (IT).
 II: The 'right to use' a piece of software is termed as copyright. Which of the above statement(s) is/are correct?
 a) Both I and II b) Neither I nor II
 c) I only d) I only

Answer Key

1	2	3	4
a	b	a	c