1. **Answer the following questions:**

1) **What is communication or computer communication? List the types of communication?**

Ans: The process of transferring data, information message etc between two or more persons using computer is called computer communication. Types of communication are:

(i)Data communication (ii) Telecommunication

2**) List the element of data communication?**

Ans: (i) Sender (ii) Medium (iii) Receiver (iv) Protocol

(3) **Difference between telecommunication and data communication with examples?**

Ans: The difference between telecommunication and data communication is:

Telecommunication	Data communication
(i) It is the types of communication which allows communicating over a long distance through the communication lines.	(i) It is a type of communication which allows the sharing the messages through source and receiver.
(ii) In this type of communication every one can have access of information.	(ii) In this type of communication data are transmitted via and analog or digital signal.
(iii) Example: Telephone, Television.	(iii) Example: Emails, Instant chatting, video conferencing.

2) **(4) What is communication media or transmission channel? List the difference types of communication media with examples?**

Ans: communication media is the channel or electronic pathway through which data or signal can be transimitted from one point to another. There are two types communication media. They are:

Guided or Bounded or Wired communication media: Guided media which use open wire or cable line for data transmission from one point to another.

Examples: Twisted Pair Cable, Coaxial cable, Fiber Optics Cable etc.

Unguided or unbounded or wireless communication media: Unguided communication media are such type of media in which data transmission is carried out through the air so also called wireless media.

Examples: Radio frequency, Microwave, Satellite, infrared etc.

3) **(5) Write the difference between guided and unguided media.**

Guided Media	Unguided Media
(i) It transmits the data over a closed path.	(i) It transmit the data through the air.
(ii) It uses physical wire to transmit the data.	(ii) It doesn't uses physical wire to transmit the data.
(iii) In this system data transmission is faster.	(iii) In this system data transmission is slower.
(iv) It is used in limited distance.	(iv) It is used in unlimited distance.

4) **(6) What is computer network? Write the purpose of computer network?**

Ans: The interconnection between two or more than two computer through transmission media in order to communicate and share resources is known as computer network.

The purpose or reason of computer network is:

a) To share peripherals

b) To share software

c) To make communication faster

d) To make information secure and reliable.

5) (7) Mention the advantage and disadvantage of computer networks?

Ans: Following are the advantage and disadvantage of computer network:

Advantage of computer network:

(1) Computer network allows the sharing of hardware devices such as hard disk, printer, modem etc.

(2) It allows the sharing of data, programs, software etc among computers.

(3) Mass data processing in computer network is cheaper.

(4) Data computing system is faster in computer network.

Disadvantage of computer network:

(1) Computer virus spreads easily through the network.

(2) Cyber crimes are originated and increased easily through the network.

(3) Initial setup cost is high so extra economic burden.

(4) Lack of trained manpower.

6) (8) List the different services provided by computer network?

Ans: Network services are the things that a network can provide. They are:

(i) Print service (ii) File service (iii) Message service (iv) Application service (v) Database service

7) (9) What is data transmission mode? Write the difference mode of data transmission example?

Ans: The way in which data is transmitted from one location to another location is called data transmission mode. There are three types of modes for transmitting data from one device to another. They are:

i) Simplex mode:

In this mode, data transmission takes place in only one direction so it is called one way communication mode. Example: Radio, newspaper, letter, etc.

ii) Half-duplex mode:

In this mode, data transmission takes place in both direction at a time. Example: walky-talky, wireless handset etc.

iii) Full-duplex mode:

In this mode, data transmission takes place in both the direction simultaneously so it is also called two way communication mode. Example: Telephone, internet etc.

8) **10) Write the difference between simplex and duplex data transmission mode?**

Simplex	Duplex
i. Simplex mode allows only one way or one direction communication system.	i. Duplex mode allows both or simultaneous communication system equally.
ii. It is also called unidirectional communication mode.	ii. It is also called bi-directional communication mode.
iii. Examples: Television, Radio, Newspaper.	iii. Examples: Telephone, Internet etc.

11) How are computer network classified into different types? List the types of computer network according to size and distance?

Ans: Computer Network can classified according to the various criteria such as size, speed of data transmission, distance covered, technology used, architecture etc. The most common and prominent classification of computer network is its size and distance covered which are as follows:

i) Local Area Network (LAN)

ii) Metropolitan Area Network (MAN)

iii) Wide Area Network (WAN)

12) What is Local Area Network (LAN)? Write its major features?

Ans: This is the type of network which covers a very limited area like a single building, college, organization etc and extending up to a few kilometer by using guided transmission media. Example of LAN is computer network in a school.

Features of LAN:

i) LAN is own privately by a single organization.

ii) LAN posses high data transmission rate usually 1 to 100 MBPS.

iii) It uses guided or wired transmission channel for data transmission.

iv) It is simpler and cheaper that other networking system.

13) What is Metropolitan Area Network (MAN)? List its major features.

Ans: MAN is a type of network which is extended to an metropolitan city or state through guided or unguided media both according to the requirement. Many similar system can be inter-connected in this network system. Example of MAN is cable TV network.

Features of MAN:

i) It is connects two or more LANs together.

ii) It is extended to an entire metropolitan city or state.

iii) It uses wired or wireless connection both.

iv) Data transmission in MAN is slower than LAN and faster than WAN.

14) Define Wide Area Network (WAN) with its characteristics.

Ans: WAN can be defined as the type of network that is extended to a large geographical area such as among countries, continents or even the world with the use of unguided media like satellite. It is the combination of different types of LAN and MAN. The best example of WAN is internet.

Characteristics of WAN:

i) WAN is owned by multiple organizations.

ii) It is extended to large geographical area worldwide.

iii) It uses wireless technology for data transmission.

iv) Data transmission in WAN is slowest that is below 1 MBPS as compared to other networks.

15) Differentiate between LAN and WAN?

Local Area Network	Wide Area Network
1. It covers small area.	1. It covers a large area.
2. It uses guided transmission media.	2. It uses unguided transmission media.
3. It is owned by single organization.	3. It is owned by multiple organization.
4. Data transmission in LAN is faster.	4. Data transmission in WAN is slower.
5. Example: Network in an office.	5. Example: Internet.

16) What is network architecture/model? Explain its types?

Ans: The network architecture, or model is defined how the computer communicate in the network. In another word it is an interaction behavior of computers on the network system.

Following are the common types of network architecture.

i) Centralized computing network architecture:

In this type of network architecture, the entire network system depends on the main computer called host computer which use the powerful operating system like UNIX or LINUX. Here the workstation has no processing capability and they are just used for input/output operation.

ii) Client/Server Network Architecture:

In this type of network architecture, each computer is connected to a device called server and communication is done through it. The server regulates the communication with the clients providing necessary resources to them. There are different types of server like print server, file server and network server etc.

iii) Peer-to-peer Network architecture:

In this type of network architecture each computers on the network have equal responsibilities of resource sharing and communication. Here, no specific server is used because computers can be either server or clients.

17) Write the advantages and disadvantages of peer to peer network architectures?

Ans: Advantage of peer-to-peer network architecture:

i) It cover the small geographical area.

ii) It provides simple cabling schemes.

iii) There is no central administrator who sets the network policies.

iv) There is no extra investment in server hardware or software required.

v) This network architecture is easy to troubleshoot.

Disadvantage of peer to peer Network architecture:

i) It has less flexibility.

ii) It is not useful for large organizations.

iii) It provides less security.

18) Write the advantages and disadvantages of Client / Server network architecture?

ANS: Advantage of Client / Server network architecture:

i) A client /server networks covers a larger geographical area.

ii) The cabling schemes can range from the simplest to the most complicated ones.

iii) It reduces the network traffic.

It centralizes the network management and security to the server.

Disadvantages of a client / server network:

i) Requires initial investment in dedicated server.

ii) Large networks will require a staff for regular maintenance to ensure efficient operation.

iii) When the server goes down, operation will cease across the network.

19) What is Network Topology or LAN topology? List the major types of topologies used in Local area network?

Ans: The cabling structure or interconnection pattern of computer in local area is called network topology or LAN topology. In another word the geographical arrangement or physical layout of computers in network is considered as network topology.

The major types of network topologies are as follows:

i) Bus topology ii) Star topology iii) Ring topology

20) Sketch and explain about bus topology?

Ans: This types of topology also known as linear topology is a type of topology in which all the computers are connected to each other in linear format through the common distribution channel called backbone cable or bus.

21) List the advantage and disadvantage of bus topology?

Ans: The advantage of bus topology are:

i) It is simple, reliable and easy to setup.

ii) It has low traffic network.

iii) It occupies least number of cables as compared to each other topologies.

iv) It is more flexible because we can connect any number of computer

Disadvantage of bus topology are:

i) Finding out the fault and trouble shooting is hard.

ii) Limited to future addition of other devices.

iii) If problem occurs on the backbone "cable" the entire network will go down.

22) Explain star topology in short with labeled diagram?

Ans: This is a type of topology in which all the nodes are connected with a central component or device called hub or switch forming a star pattern. While sending information from one node another node. It is passed through the central controlling device which in turn interprets the address and sends the information appropriately to the destination node.

23) List out the advantages and disadvantages of star topology?

Ans: Advantage of star topology:

i) Easy to install and cable connection.

ii) No disruption to the networks then connecting or removing devices.

iii) Easy to detect faults and to remove parts.

iv) High data transmission to expand.

Disadvantage of star topology:

i) Requires more cable length than a linear topology.

ii) If the hub or connection fails, nodes attached are disabled.

iii) This topology is difficult to expand.

24) What is ring topology? Explain briefly with diagram?

ANS: A ring topology is such type of network topology in which all nodes are connected to each other in a circular, loop or ring. In this topology there is no server and communication takes place only one direction i.e. either clockwise topology or anti clockwise.

25) List out the advantages and disadvantages of Ring topology?

Ans: Advantage of ring topology

i) Ring topology works well where there is no central site computer system.

ii) Short cable connection which cause and increase in network reliability.

iii) Less chance of data collision because data travel in one direction.

iv) Every computer has equal access facility.

Disadvantage of ring topology:

i) Any communication path or node failure causes network failure.

ii) Network configuration is difficult.

iii) Addition of new node increases the communication delay.

26) Explain in short the following network transmission devices?

i) Media connector:

Media connector serves as the physical interface between cabling and network nodes which is attached directly to the mediam itself. Some examples of media connectres are BNC, T-conncetor, RJ-45 connector, DIX connector etc.

ii) Network Interface Card (NIC)

The NIC also knows as Ethernet card or network adapter is network connecting device which contains the electronic circuitry needed to ensure communication between workstation and server.

iii) Repeaters:

A repeaters is a network hardware which accepts weak signals, electricity regenerates them and then sends the message on their way. There are two types of repeaters.

i) Amplifiers ii) Signal regenerating repeaters.

iv) Hub: Hub is a network connecting device also known as multiport repeater with various ports for connecting computers on the computers on the network that is compulsorily used in star network. There are three types of hub.

i) Passive hub ii) Active hub iii) Intelligent hub

27) What is internetworking transmission devices? Give some examples?

Ans: Internetworking devices are hardware devices used to connect two or more networks from a single network. Following are the some examples of internetworking transmission devices.

i) bridge:

A bridge is a network connecting device, which inter-connect two networks that use the same technology and protocol.

ii) router:

A router is an intelligent network connecting device which sets best path and route for data transmission on the network. Router can sound data between networks that use the same and different technology as well protocols.

iii) Gateway:

A gateway is a network connecting device that interconnects two networks using different technologies and protocols.

iv) Switch:

A switch is a device that provides a central connection points for cables from workstations, servers and peripherals. It also connects the different LAN segments together.

28) Define the following communication transmission devices?

ANS: Modem:

Modem stands for modulator and demodulator. It is a device by which we may connect our PC to the ISP over the telephone line. Modem also converts analog signal to digital and vice versa. There are two types of modem internal and external modem.

ii) Multiplexers:

Multiplexers is network communication device which allows sending multiple signal across a single transmission medium. Example: Cable of cable television.

iii) CSU/DSU:

CSU (Channel Service Unit) / DSU (Digital Service Unit) is used to connect digital computer to digital transmission media instead of analog transmission media.

29) What is protocol? List the difference types of protocol?

ANS: Protocol are commonly agreed rules followed for interconnection and communication between computers in a network. In another word protocol is the set of rules and procedures followed by every computer on entire network for making communication possible. The following are the common protocols used in network system.

TCP/IP	It is used in internet system.
HTTP	It is used between web server and web client.
FTP	It is used to upload / download files/
SMTP	It is used to send emails.
POP	It is used to receive emails.

30) Write the short notes on the following guided transmission media?

i) Twisted pair cable:

Twisted pair cable is a common and inexpensive transmission media used in voice grade telephone lines. This media can be used for low speed transmission of signals but when line length goes beyond 100m, the error rates becomes high.

ii) Coaxial cable: Coaxial cables are such type of guided media which have wide band width and noise immunity. These are widely used in long distance telephone lines. Its transmission speed is much higher than twisted pair of cables.

iii) Fiber optics cables: Fiber optic cable are made of plastic or glass fiber which gives high quality transmission are not affected by electromagnetic interference. These can be used to communicate either analog or digital signals. These are most commonly used for point to point one way communication links.

30) What is modulation? List its types?

ANS: The process of converting the wave into amplitude frequency or phase is called modulation.

Types of modulation:

1) Amplitude Modulation (AM)

2) Frequency Modulation (FM)

3) Phase Modulation (PM)

31) What do you mean by Band-width? How is it expressed?

Ans: Band-width is the amount of data that can be transmitted through communication channel in a fixed time period. It is expressed in terms of Hertz (bps).

32) What is server? List the difference types of server?

Ans: The computer that acts the central authority on a server based network is called the server. Server is the powerful computer having higher processing and larger storage capacity compared to clients. Following are the various types of server:

i) File server ii) Print Server

iii) Network server iv) Communication server

33) Define the following network related terms?

i) Clients:

The clients are the computers on which users run applications. Clients are less powerful computers in comparison with servers.

ii) Workstation:

The individual personal computer used by network user is known as workstation.

34) Write a short notes on the following types of servers:

i) File server:

A file server is the host computer of LAN which manages the communication with other personal computer attached to it.

ii) Print server:

The special printer which can receive and print data from any computer connected to LAN is known as print server.

iii) Communication server or modem server:

The process of shared modems through LAN so that the entire computer can communicate to each other is called communication server.

35) What is network software?

Ans: Software is the major components to create a network environment to share data and other resources.

36) What do you mean by network operating system? List some examples of network OS.

Ans: The group of programs that manage the resources on the network and establishes well defined environment for smooth data processing is called the network operating system.

Examples: MS-windowNT, MS-windows 2000, MS-XP, Linux etc.

37) Explain, how the computer network reduces cost of operation?

Ans: Computer network enables information sharing, hardware and software sharing provides centralized administration and support. Thus, many resources like information, hardware and software or any other related items can be shared with each other without having bought new one. Therefore it is true that computer network reduces the cost of operation.

38) What is the difference between Broad Band Width and Narrow Band Width system?

Ans:

Broad Band Width	Narrow Band Width
1. It supports higher data frequency.	1. It supports lower data frequency.
2. Data transmission is faster.	2. Data transmission is slower.

39) What is the difference between dedicated and non-dedicated server?

Ans:

Non-dedicated server	Dedicated server
1. Provides resources to the other computer users.	1. Controls the other computers and users.
2. Allows computer to use as workstation.	2. Does not allow computer to use as workstation.

40) What is signal? Explain Analog and Digital Signals with figures?

Ans: A signal is an electronic current or electronic field that is used to convey data from one place to another. The simplest form of signal is Direct Current and the complex form of signals are used while transferring information through electronic media. They are:

i) Analog Signal: Analog signal are the signals with continuous values. An analog is a power range that varies continuously amplitude (values) which is measured in volts and its frequency (f) in hertz (Hz). Higher the frequency, the more number of times it crosses the time axis.

ii) Digital signal: Digital signal is represented by binary numbers. It is a sequence of voltage pulses represented in discrete on/off (i.e 1 and 0 forms). The 1 and 0 can correspond to different discrete voltage values, and any signal that does not quite fit into the scheme just gets round off.

41) Differentiate between Hub and Switch?

Hub	Switch
1. It is dumb device which repeats the signals to all the nodes.	1. It is and intelligent device which repeats the signals to destination node.
2. It is half duplex devices.	2. It is full duplex device.

45) Write the full form of the following:

LAN – Local Area Network

MAN – Metropolitan Area Network

WAN – Wide Area Network

IPX - Internetwork Packet Exchange

IEEE – Institute of Electrical and Electronic Engineers

UTP – Unshielded Twisted Pair

STP – Shielded Twisted Pair

PSTN – Public Switched Telephone Network

NIC – Network Interface Card

Wi-fi – Wireless Fidelity

FDDI – Fiber Distributed Data Interface

ARC net – Attached Resource Computer Network

NAT – Network Over Internet Protocol

W3c – World Wide Web Consortium

SPX – Sequence Packet Exchange

DIX – Digital Intel and Xerox

CSMA/CD – Carriers Sense Multiple Access / Collision Detection

DNA – Digital Network Architecture

SNA – System Network Architecture

MBPS – Megabits Per Second

BPS – Bits Per Second

KBPS – Kilo Bits Per Second

FM – Frequency Modulation

PM – Phase Modulation

BNC – British Naval Connector

CSU/DSU – Channel Service Unit / Digital Service Unit

EMI – Electro Magnetic Interference

MAC – Media Access Control

CAN – Campus Area Network

ADSL – Asymmetric / Asynchronous Digital Subscriber Line

RJ-45 – Registered Jack-45

MODEM – Modulator and Demodulator

USB – Universal Serial Bus

POP – Post Office Protocol

ARP – Address Resolution Protocol

ISDN – Integrated Service Digital Network

ASCII – American Standard Code for Information Interchange

WLAN – Wireless Local Area Network

EBCDIC – Extended Binary Coded Decimal Interchange Code

VSAT – Very Small Aperture Terminal

VHF – Very High Frequency

UHF – Ultra High Frequency

DNS – Domain Name Service

WWW – World Wide Web

EDP – Electronic Data Processing

NOS – Network Operating System

BBS – Bulletin Board Service

MBR – Master Boot Record

DEC – Digital Equipment Corporation

NEC – Nippon Electronics Company

LED – Light Emitting Diode

IBM – International Business Machine

ICL – International Computer Limited

BIOS – Basic Input Output System

OFC – Optical Fiber Cable

NNTP – Network News Transfer Protocol

NETBEUI – Network Bios Extended User Interface