COMMUNICATION AND NETWORK CONCEPTS
TYPE A: VERY SHORT ANSWER QUESTION

1.	**Define a network. What is its need?**
Ans.	A network is an interconnected collection of autonomous computer that can share and exchange information. **Need for networking:** • Resource sharing (Processing, Peripherals, Information and software) • Communication between computers
2.	**Write two advantage and disadvantage of networks.**
Ans.	**Advantage:** • We can share resources such as printers and scanners. • Can share data and access file from any computer. **Disadvantage:** • Server faults stop applications from being available. • Network faults can cause loss of data.
3.	**What is ARPAnet ? What is NSFnet ?**
Ans.	**ARPAnet** (Advanced Research Project Agency Network is a project sponsored by U. S. Department of Defense. **NSFnet** was developed by the National Science Foundation which was high capacity network and strictly used for academic and engineering research.
4.	**What do you understand by InterSpace?**
Ans.	Interspace is a client/server software program that allows multiple users to communicate online with real-time audio, video and text chat I dynamic 3D environments.
5.	**Name two switching circuits and explain any one.**
Ans.	The two switching circuits are • Circuit Switching • Message Switching **Circuit Switching -** In this technique, first the complete physical connection between two computers is established and then data are transmitted from the source computer to the destination computer.
6.	**What is communication channel? Name the basic types of communication channels available.**
Ans.	Communication channel mean the connecting cables that link various workstations. Following are three basic types of communication channels available: a) Twisted-Pair Cables b) Coaxial Cables c) Fiber-optic Cables
7.	**Define baud, bps and Bps. How are these interlinked?**
Ans.	**Baud** is a unit of measurement for the information carrying capacity of a communication channel. **bps-** bits per second. It refers to a thousand bits transmitted per second. **Bps-** Bytes per second. It refers to a thousand bytes transmitted per second. All these terms are measurement units used to refer to the amount of information travelling through a single channel at any one point of time.
8.	**What are the various types of networks?**
Ans.	There are three types of networks : i. Local Area Networks (LANs) ii. Metropolitan Area Network (MAN) iii. Wide Area Networks (WAN)
9.	**What is the difference between MAN and WAN?**
Ans.	✓ MANs are the networks that link computer facilities within a city. ✓ WANs are the networks spread over large distances.
10.	**What is meant by topology? Name some popular topologies.**
Ans.	Topology refers to the way in which the workstations attached to the network are interconnected. The most popular topologies are :

(a) Bus or Linear Topology
(b) Ring Topology
(c) Star Topology
(d) Tree Topology

11. **What are the factors that must be considered before making a choice for the topology?**

Ans. There are number of factors to consider in before making a choice for the topology, the most important of which are as following :

(a) Cost.
(b) Flexibility
(c) Reliability

12. **What are the similarities and differences between bus and tree topologies?**

Ans. **Similarities :**

- ✓ In both Bus and Tree topologies transmission can be done in both the directions, and can be received by all other stations.
- ✓ In both cases, there is no need to remove packets from the medium.

Differences :

- ✓ Bus topology is slower as compared to tree topology of network.
- ✓ Tree topology is expensive as compared to Bus Topology

13. **What are the limitations of star topology?**

Ans.

- ✓ Requires more cable length than a linear topology.
- ✓ If the hub, switch, or concentrator fails, nodes attached are disabled.
- ✓ More expensive than linear bus topologies because of the cost of the hubs, etc.

14. **When do you think, ring topology becomes the best choice for a network?**

Ans. Ring topology becomes the best choice for a network when,

- ✓ Short amount of cable is required.
- ✓ No wiring closet space requires.

15. **Write the two advantages and two disadvantages of Bus Topology in network.**

Ans. **Advantage:**

- ✓ Easy to connect a computer or peripheral to a linear bus.
- ✓ Requires less cable length than a star topology.

Disadvantage :

- ✓ Slower as compared to tree and star topologies of network
- ✓ Breakage of wire at any point disturbs the entire network

16. **Briefly mention two advantages and two disadvantages of Star Topology in network.**

Ans. **Advantage:**

- ✓ Easy to install and wire.
- ✓ No disruptions to the network when connecting or removing devices.

Disadvantage :

- ✓ Requires more cable length than a linear topology.
- ✓ If the hub, switch, or concentrator fails, nodes attached are disabled.

17. **Give two advantages and two disadvantages of following network topologies :**
(i)Star (ii)Tree

Ans.

Star Topology	**Tree Topology**
Advantage : ✓ Easy to install and wire. ✓ No disruptions to the network when connecting or removing devices.	**Advantage :** ✓ Faster as compared to Bus Topology. ✓ Easier to set-up for multi-floor plans of network.
Disadvantage : ✓ Requires more cable length than a linear topology. ✓ Expensive as compared to Bus Topology	**Disadvantage :** ✓ Slower as compared to Star Topology. ✓ Expensive as compared to Bus Topology**.**

18. **Give two advantages and two disadvantages of following network topologies :**
(i)Bus (ii)Tree

Ans. **Bus Topology**

Advantage:
- ✓ Easy to connect a computer or peripheral to a linear bus.
- ✓ Requires less cable length than a star topology.

Disadvantage:
- ✓ Slower as compared to tree and star topologies of network
- ✓ Breakage of wire at any point disturbs the entire network

Tree Topology

Advantage:
- ✓ Faster as compared to Bus Topology.
- ✓ Easier to set-up for multi-floor plans of network.

Disadvantage:
- ✓ Slower as compared to Star Topology.
- ✓ Expensive as compared to Bus Topology**.**

19. **Write two advantages and disadvantages of following :**
(i)Optical fibers (ii) Satellites (iii) Microwaves.

Ans. **Advantage :**

Optical fibers	**Satellites**	**Microwaves**
It is guarantees secure transmission.	Large area coverage of earth.	Free from land acquisition rights.
It is very high transmission capacity	Inexpensive compare to cable.	Ability to communicate over oceans.

Disadvantage :

Optical fibers	**Satellites**	**Microwaves**
Expensive.	Require high investment in case off failure.	Insecure Communication.
Hard to install.	Requires legal permissions.	Limited bandwidth.

20. **Write two disadvantages of twisted pair cables.**
Disadvantage :

Ans.
- ✓ It is not capable to carrying signal to long distance.
- ✓ It connects only up to 100 meters.

21. **What is modem? Name two categories of modems.**

Ans. Modem is a device that converts digital communication signals to analog communication digital signals and vice versa.
Following are the two categories of modems.
1) Internal Modem (Fixed with computer)
2) External Modem (Connect externally to computer).

22. **Define the following :**
(i)RJ-45 (ii)Ethernet (iii) Ethernet card (iv)hub (v)Switch

Ans. **(i) RJ-45:** RJ45 is a standard type of connector for network cables and networks. It is an 8-pin connector usually used with Ethernet cables.
(ii)Ethernet: Ethernet is a LAN architecture developed by Xerox Corp along with DEC and Intel. It uses a Bus or Star topology and supports data transfer rates of up to 10 Mbps.
(iii)Ethernet card: The computers parts of Ethernet are connected through a special card called Ethernet card. It contains connections for either coaxial or twisted pair cables.
(iv)Hub: In computer networking, a hub is a small, simple, low cost device that joins multiple computers together.
(v)Switch: A Switch is a small hardware device that joins multiple computers together within one local area network (LAN).

23. **Define the following :**
(i)Protocol (ii) Host (iii) Repeater (iv) Bridge (v) Router (vi) Gateway.

Ans.	**(i)Protocol:** A protocol is a description of the rules and message formats that computers must follow to communicate with each other. **(ii)Host:** The computer system providing the web-hosting is known as the web host. It allows their customers to place web documents onto a special type of computer called a web server. **(iii)Repeater:** It is a device that amplifies and restores the power of a signal being transmitted on the network.. **(iv)Bridge:** A bridge is a device designed to connect two LAN segments. The purpose of a bridge is to filter traffic on a LAN. **(v)Router:** A router is a networking device whose software and hardware are usually tailored to the tasks of routing and forwarding information. **(vi)Gateway:** A network gateway is a computer which has internetworking capability of joining together two networks that use different base protocols.
24.	**What is remote login? What is Telnet?**
Ans.	**Remote login:** Remote login is the process of accessing a network from a remote place without actually being at the actual place of working. **Telnet:** Telnet is an Internet utility that lets you log onto remote computer system.
25.	**Briefly explain file transfer protocol.**
Ans.	✓ FTP stands for File Transfer Protocol. ✓ FTP can transfer any type of file between two computers. ✓ Also used as a command such as FTP ftp.cbsecsnip.in
26.	**What is Internet? What is E-mail?**
Ans.	**Internet:** The Internet is a worldwide network of computer networks around the globe. **E-mail:** E-mail or electronic mail is sending and receiving of messages by a computer.
27.	**What are the advantages of E-mail? What are the disadvantages of E-mail?**
Ans.	**Advantage:** ✓ Low cost. ✓ Speed. ✓ Waste reduction. **Disadvantage:** ✓ Computer literacy. ✓ Sent mail can be changed or deleted. ✓ Easy to sent a message that you latter regret. ✓ Hard to express emotions.
28.	**What is structure of an E-mail message?**
Ans.	An electronic mail messages is structured very much like a paper letter. In mail message, there are three parts : ✓ **The header** – is the envelope, ✓ **The body** – is the actual message, ✓ **The signature** – comes at the end. Some common header lines include : ✓ **To:** The recipient(s) of the message. ✓ **Date:** The date the message was sent. ✓ **From:** The person who sent the message. ✓ **Cc:** The people who were mailed copies of the message.
29.	**What is HTML? Where it is used?**
Ans.	HTML (Hyper Text Markup Language) which is used to create Hypertext documents (web pages) for websites. HTML is the static markup language. ✓ It is used to create Web Pages. ✓ Tells the browser how to display text, pictures and other support media. ✓ Support multimedia and new page layout features. ✓ Provides may tags for control the presentation of information on the web pages, such as <body>, , <hr> etc.

30.	**What is URL? What is WWW?**
Ans.	**URL:** URL (Universal Resource Locater) specifies the distinct address for each resource on the Internet, such as ftp, http etc. **WWW:** WWW (World Wide Web) is a set of protocol that allows you to access any document on the Internet through a naming system based on URL's.
31.	**What is protocol? Name some commonly used protocols.**
Ans.	A protocol means the rules that are applicable for a network or we can say that the common set of rules used for communication in network. Different types of protocols are : (i) HTTP : Hyper Text Transfer Protocol (ii) FTP : File Transfer Protocol (iii) SLIP : Serial Line Internet Protocol (iv) PPP : Point to Point Protocol (v) TCP/IP : Transmission Control Protocol/ Internet Protocol (vi) NTP : Network Time Protocol (vii) SMTP : Simple Mail Transfer Protocol (viii) POP : Post Office Protocol (ix) IMAP : Internet Mail Access Protocol
32.	**What is TCP/IP? What is HTTP?**
Ans.	**TCP/IP (Transmission Control Protocol / Internet Protocol):** A protocol for communication between computers used as a standard for transmitting data over networks and is the basis for standard Internet protocols. **HTTP(Hyper Text Transfer Protocol) :** An application level protocol with the lightness and speed necessary for distributed, shared, hypermedia information systems
33.	**Define Mobile Communication and Wireless Communication.**
Ans.	**Mobile Communication** essentially refers to a computing device that is not continuously connected to the base or central network. This may include laptops, newly created smart phones and also PDA's. **Wireless Communication** is simply data communication without the use of a landline. This may involve a cellular telephone, a two way radio, a fixed wireless connection, a laser, or satellite communications.
34.	**Define GSM, CDMA, and WLL.**
Ans.	**GSM:** GSM (Global system for mobile communication) is a wide area wireless communications System that uses digital radio transmission to provide voice data and multimedia communication services. A GSM system coordinates the communication between mobile telephones, base stations, and switching systems. **CDMA:** CDMA (Code Division Multiple Access) is a digital wireless telephony transmission technique, which allows multiple frequencies to be used simultaneously – Spread Spectrum. **WLL:** WLL (Wireless in Local Loop) is a system that connects subscriber to the public switched telephone network (PSTN) using radio signal as alternate for other connecting media.
35.	**Define the following: (i)3G (ii)EDGE (iii)SMS (iv)TDMA**
Ans.	**(i) 3G:** 3G (Third Generation) mobile communication technology is a broadband, packet-based transmission of text, digitized voice, video and multimedia at data rates up to 2 mbps, offering a consistent set of services to mobile computer and phone users no matter where they are located in the world. **(ii)EDGE:** EDGE (Enhanced Data rates for Global Evolution) is radio based high-speed of mobile data standard, developed specifically to meet the bandwidth needs of 3G. **(iii)SMS:** SMS (Short Message Service) is the transmission of short text messages to and from a mobile phone, fax machine and IP address. **(iv)TDMA:** TDMA (Time Division Multiple Access) is a technology for delivering digital wireless service using time-division multiplexing (TDM).
36.	**What is Voice-Mail? What is Chatting?**
Ans.	**Voice-Mail:** The voice-mail refers to e-mail system that support audio. User can leave spoken message for one another and listen to the messages by executing the appropriate command in the e-mail system. **Chatting:** It is an application to communicate with a person, a group, or a site on the Internet in real time by typing text. The text appears on the screen(s) of all the other participants in the "chat".
37.	**What is Video conferencing?**

Ans. It is a conference between two or more participants at different locations over the Internet or a private network. Each user has a video camera, microphone, and speakers mounted on his or her computer. As the participants speak to one another, they hear each other's voices and see a video image of the other participant(s).

38. Define web browser and web server.

Ans. **Web Browser:** A Web Browser is software which used for displaying the content on web page(s). It is used by client to view web sites. Example of Web browser – Google Chrome, Fire Fox, Internet Explorer, Safari, Opera, etc.
Web Server: A Web Server is software which fulfills the request(s) done by web browser. Web server have different ports to handle different request from web browser like generally FTP request is handle at Port 110 and HTTP request is handle at Port 80. Example of Web server are – Apache, IIS

39. What is web hosting?

Ans. Web Hosting is a means of hosting web-server application on a computer system through which electronic content on the Internet is readily available to any web- browser client.

40. What is hacking?

Ans. Hacking is process of accessing of a computer system or network without knowing the access authorization credential of that system. Hacking can be illegal or ethical depending on the intention of the hacker.

41. (a) What is purpose of using a gateway in context of networking?

Ans. In network gateway is used to connect dissimilar networks. It establishes an intelligent connection between a local network and external networks with completely different structures.

(b) Write an advantage and a disadvantage of using Optical fiber cable.

Ans.

Advantages :
- ✓ Secure transmission.
- ✓ Low attenuation.
- ✓ No EMI interference.
- ✓ Very high transmission capacity.
- ✓ Used for broadband transmission and possible to mix data transmission channels with cannels for telescope, TV etc.

Disadvantages :
- ✓ Expensive.
- ✓ Difficult to connect to fibers.
- ✓ Hard to install.
- ✓ Noise exception.
- ✓ Connection loss.
- ✓ Difficult to repair.

(c) Write one advantage and one disadvantage of following network topologies in network : (i)BUS Topology , (ii)STAR Topology

Ans.

BUS Topology

Advantage :
- ✓ Simple architecture.

Disadvantage :
- ✓ Breakage of wire at any point disturbs the entire network.

STAR Topology

Advantage :
- ✓ Easy to detect faults and to remove parts.

Disadvantage :
- ✓ Expensive as compared to Bus Topology

(d) What is the difference between LAN and MAN?

Ans.

LAN	MAN
LANs are computer networks confined to a localized area such as an office or a factory.	MANs are the networks that link computer facilities within a city.

42. What is the purpose of using a repeater in context of networking?

Ans. Purpose of using repeater in context of networking is to amplify transmission signals when these signal become weaker due to long distance transmission.

43. What are cookies?

Ans. Cookies are messages that a Web server transmits to a web browser so that the Web server can keep track of the user's activity on a specific Web site. Cookies are saved in form of text file in client computer.

44. What is cracking? How is it different from hacking?

Ans. Cracking is defined as the attempt to remove the copy protections inserted into software programs. A program successfully stripped of protections is then known as having been "Cracked".

	Some of the removed protections include: Time limits, Registration Screen, Serial Number. Hacking can be ethical/legal but cracking is totally illegal method also called piracy.
45. **Ans.**	**What is 80 – 20 rule of network design?** In a properly designed small to medium-sized network, 80 percent of the traffic on a given segment should be local, and not more than 20 percent should need to move across a backbone link.
46. **Ans.**	**Which of the following (i) is not a broadcast device (ii) offers a dedicated bandwidth?** (a) Repeater (b) bridge (c) hub (d) switch (i) Bridge (ii) Switch
47. **Ans.**	**What is web scripting?** A script is a small bit of code that enables web browsers to do something rather than just displaying static results. Scripts are used in web design to create dynamic pages. There are 2 categories of Web script Client Side Script which can be written by using JavaScript, VB Script and Server Side Script which can be written in PHP, JSP
48. **Ans.**	**Name some web scripting languages.** There are many scripting languages available today. Most common once are VBScript, JavaScript, ASP, PHP, PERL, and JSP.
49. **Ans.**	**What is Cyber Crime?** As define in Cambridge dictionary defines Cyber Crimes as Crimes committed with the use of computers or relating to computers, especially through the Internet. Universally, Cyber Crime is understood as an unlawful act where in the computer is either a tool or a target or both.
50. **Ans.**	**When was IT Act enforced in India?** In India, IT Act was enforced on 17 October 2000.

TYPE B: SHORT ANSWER QUESTION

1. **Ans.**	**What is network? What are its goals and applications?** A network is an interconnected collection of autonomous computer that can share and exchange information. **Network Goals** Following are some of the network goals : ✓ Resource Sharing ✓ Reliability ✓ Reduced costs ✓ Communication Medium **Application of Networks** Following are the some of the important applications of network : ✓ Sharing ✓ Access to remote database ✓ Communication facilities
2. **Ans.**	**Briefly explain how Internet evolved.** ✓ Evolution of networking started way back in 1969 by the development of first network called ARPANET. The goal of this project was to connect computers at U. S. defense & different universities. ✓ In 1980's, the NSFnet was started to make high-capacity network strictly for academic and engineering research ✓ In 1990sthe internetworking of ARPANET, NSFnet and other private networks resulted into Internet.
3. **Ans.**	**Write a short note on ARPAnet.** ✓ Stands for Advanced Research Project Agency Network. ✓ It is a project sponsored by U. S. Department of Defense. ✓ Planted in 1969 to connect computers at U. S. defense & different universities. ✓ The users of this system were able to exchanging data and messages, play long distance games and socialize with people who share their interests. ✓ In 1980s, NSFnet was started to make high capacity network, which are more capable than ARPANET.

	✓ In 1990s the internetworking of ARPANET, NSFnet and other private networks resulted into internet.
4. **Ans.**	**How does Internet work?** In Internet, most computers are not connected directly to the Internet. Rather they are connected to smaller network, which in turn are connected through gateways to the Internet backbone. The reason that Internet works at all is that every computer connected to it uses the same set of rules for communication called protocol. **How Internet functions :** ✓ Firstly the information or file to be sent to another computer is divided into small parts called Packets. ✓ Each packet is given a sequential number e.g. 1, 2, 3. ✓ Then packets are sent to the address of destination computer. ✓ The destination computer receives the packets randomly. If packet is lost it is demanded again. ✓ Then packets are rearranged in their correct order and get actual information/file.
5. **Ans.**	**Write a short note on InterSpace.** ✓ InterSpace is a client/server software program that allows multiple users to communicate online with real-time audio, video and text chat I dynamic 3D environments. ✓ Provide most advanced form of communication. ✓ It is an application environment for interconnecting spaces to manipulate information. ✓ Vision of what Internet become, where users cross-correlates information in multiple ways from multiple sources.
6. **Ans.**	**How is circuit switching different from message switching?** Circuit switching – when communication needs to take place, a dedicated path is opened end to end for the duration of the communication session. An example would be plain old telephone service. Packet switching – is taking data and breaking it into little packages, or packets. Those packets are then sent across a network. The path that those packets take are not dedicated. So, individual packets may take separate paths on the network to get to the destination. This is how the internet works.
7. **Ans.**	**How does transmission take place across networks?** Various switching techniques are used to transmit data across networks. These are as following: ✓ Circuit Switching. ✓ Message Switching. ✓ Packet Switching.
8. **Ans.**	**What are communication channels? Discuss various communication channels available for networks.** Communication channel mean the connecting medias that link various workstations. Following are three basic types of communication channels available: a) Twisted-Pair Cables: This cable consists of two insulated copper wires twisted around each other. These are also used for short and medium range telephone communication. b) Coaxial Cables: A coaxial cable consists of one or more small cables in protective covering. These are more expensive than twisted pair cables but perform better. c) Fiber-optic Cables: These cables are made of plastic or glass and are about as thin as human hair. These cables are highly durable and offer excellent performance but are expensive.
9. **Ans.**	**Write some advantages and disadvantages of following :** **(i) Optical fibres (ii) coaxial cables (iii) twisted pair cables (iv) radio waves (v) micro waves (vi) satellites.** **Optical Fibres** **Advantage** ✓ Secure transmission. ✓ Low attenuation. ✓ No EMI interference. ✓ Very high transmission capacity. ✓ Used for broadband transmission and possible to mix data transmission channels with cannels for telescope, TV etc. **Disadvantage** ✓ Expensive. ✓ Difficult to connect to fibers. ✓ Hard to install. ✓ Noise exception. ✓ Connection loss. ✓ Difficult to repair. **Coaxial Cables**

Advantage

- ✓ Better data transmission than twisted-pair cables.
- ✓ Used as source for shared cable network.
- ✓ Used for broadband transmission.
- ✓ Higher bandwidths up to 400 mbps.

Disadvantage

- ✓ Single cable failure can take down an entire network.
- ✓ Expensive
- ✓ Not compatible with twisted pair cables.

Twisted Pair Cables

Advantage

- ✓ Simple.
- ✓ Flexible.
- ✓ Low weight.
- ✓ Inexpensive.
- ✓ Connected easily.
- ✓ Easy to install and maintain.

Disadvantage

- ✓ Incapable for long distance.
- ✓ Unsuitable for long distance.
- ✓ Supports maximum data rates 1 mbps without conditioning and 10 mbps with conditioning.

Radio Waves

Advantage

- ✓ Free from land acquisition rights.
- ✓ Provides ease of communication over difficult terrain.
- ✓ Provide mobility.
- ✓ Inexpensive

Disadvantage

- ✓ Insecure communication.
- ✓ Susceptible to weather effects.

Micro Waves

Advantage

- ✓ Inexpensive.
- ✓ Free from land acquisition rights.
- ✓ Provides ease of communication over difficult terrain.
- ✓ Ability to communicate over oceans.

Disadvantage

- ✓ Insecure Communication.
- ✓ Reduce signal strength.
- ✓ Susceptible to weather effects.
- ✓ Limited bandwidth.
- ✓ High cost for implementation and maintenance.

Satellites

Advantage

- ✓ Large area coverage of earth.
- ✓ Inexpensive compare to cable.
- ✓ Commercial attractive.
- ✓ Useful for sparsely populated areas.

Disadvantage

- ✓ Cannot deploy large, High gain antennas.
- ✓ Overloading of available bandwidths.
- ✓ Require high investment in case off failure.
- ✓ High atmospheric losses above 30 GHz limit carrier frequencies.
- ✓ Requires legal permissions.

10. Ans. **What is bandwidth? How is it measured?**

Bandwidth is the amount of data that can be transmitted via a given communications Channel in a given unit of time. It exactly shows that how much stuff that you can send through a connection. Bandwidth is measured in kilohertz (KHz), megahertz (MHz), gigahertz (GHz), terahertz (THz).

11. Ans. **What do you understand by data transfer rates?**

The speed with which data can be transmitted from one device to another. Data rates are often measured in megabits (million bits) or megabytes (million bytes) per second. These are usually abbreviated as Mbps and

MBps, respectively.

12. Discuss and compare various types of networks.

Ans. There are three types of networks :

a) LAN (Local Area Network) – A group of computers that shares a common connection and is usually in a small area or even in the same building. For example, it can be an office or a home network. It is usually connected by Ethernet cables and has high speed connections. If it was a wireless setup, it would be called a WLAN, which would have a lower connection speed.

b) MAN (Metropolitan Area Network) –This is a larger network that connects computer users in a particular geographic area or region. For example, a large university may have a network so large that it may be classified as a MAN. The MAN network usually exists to provide connectivity to local ISPs, cable TV, or large corporations. It is far larger than a LAN and smaller than a WAN. Also, large cities like London and Sydney, Australia, have metropolitan area networks.

c) WAN (Wide Area Network) – This is the largest network and can inter-connect networks throughout the world because it is not restricted to a geographical location. The Internet is an example of a worldwide public WAN. Most WANs exist to connect LANs that are not in the same geographical area. This technology is high speed and very expensive to setup.

13. Explain various mostly used topologies.

Ans.

1. **Bus or Linear Topology** – It is characterized by common transmission medium shared by all the connected hosts, managed by dedicated nodes. It offers simultaneous flow of data and control.
2. **Ring Topology** – A ring topology connects one host to the next and the last host to the first. This creates a physical ring of cable.
3. **Star Topology** – It is characterized by central switching mode (communication controller) unique path (point-to-point link) for each host. It is easy to add and remove additional host by upgrading the centralized node.
4. **Tree Topology** – A tree topology may be defined as a group of bus topologies put together and controlled by one node.

14. Discuss the factors that govern the selection of topology for a network.

Ans. There are number of factors that govern the selection of topology for a network, the most important of which are as following :

a) Cost – For a network to be cost effective, one would try to minimize installation cost. This may be achieved by using well understood media and also, to a lesser extent, by minimizing the distances involved.

b) Flexibility – Because the arrangement of furniture, internal walls etc. in offices are often subject to change, the topology should allow for easy reconfiguration of the network. This involves moving existing nodes and adding new ones.

c) Reliability – Failure in a network can take two forms. Firstly, an individual node can malfunction. This is not nearly as serious as the second type of fault where the network itself fails to operate. The topology chosen for the network can help by allowing the location of the fault to be detected and to provide some means of isolating it.

15. Compare and contrast

(i)Star and Bus topologies (ii)Star and Tree topologies (iii) Bus and Ring topologies

Ans.

(i)Star and Bus topologies

Comparison :	**Contrast :**
✓ In both topologies all devices are connected to a central cable/hub.	✓ Bus topology is slower in contrast to star topologies of network ✓ Star topology is expensive in contrast to Bus Topology

(ii)Star and Tree topologies

Comparison :	**Contrast :**
✓ Both required more wiring.	✓ Tree topology is slower in contrast to star topologies of network.

	✓ More difficult to configure in contrast to star topologies.

(iii) Bus and Ring topologies

Comparison :	Contrast :
✓ Difficult to identify the problem if the entire network shuts down. ✓ If one node fails to pass the data, entire network has failed.	✓ Ring topology faster communication in contrast to Bus topology. ✓ In contrast to Bus topology Ring topology has independent line of connection which allows freedom of removing or adding nodes from the network.

16. What is the role of modem in electronic communications?

Ans. A modem (modulator-demodulator) is a device that modulates an analog carrier signal to encode digital information, and also demodulates such a carrier signal to decode the transmitted information. The roal is to produce a signal that can be transmitted easily and decoded to reproduce the original digital data. Modems can be used over any means of transmitting analog signals, from light emitting diodes to radio.

17. What are hubs? What are its types?

Ans. A common connection point for devices in a network. Hubs are commonly used to connect segments of a LAN. A hub contains multiple ports. Hubs can be either passive or active

Passive Hub – A passive hub serves simply as a conduit for the data, enabling it to go from one device (or segment) to another.

Active Hub –In a situation of data received being weak but readable, the active hub restores the signal before rebroadcasting the same.

18. What is the role of switch in a network?

Ans. A switch is a hardware device that joins multiple computers together within one local area network (LAN). Network switches appear nearly identical to network hubs, but a switch generally contains more intelligence than a hub. Unlike hubs, network switches are capable of inspecting data packets as they are received, determining the source and destination device of each packet, and forwarding them appropriately.

19. Briefly discuss the role of following devices in the context of networking.

Ans. **(i)repeater (ii)router (iii)bridge (iv)gateway**

Repeater – A repeater amplifies the input signal to an appropriate level and works at the physical level of the OSI model. Sometimes the signal on the Internet becomes weak before reaching the destination node. Thus, repeater is used to regenerate the incoming packet and amplify it and then transmit it to another segment of the network.

Router – A router is a device or, in some cases, software in a computer which is connected to at least two networks and decides which way to send each information packet based on its current understanding of the state of the networks it is connected to.

Bridge – A bridge device filters data traffic at a network boundary. Bridges reduce the amount of traffic on a LAN by dividing it into two segments. Bridges inspect incoming traffic and decide whether to forward or discard it. An Ethernet bridge, for example, inspects each incoming Ethernet frame - including the source and destination MAC addresses, and sometimes the frame size - in making individual forwarding decisions.

Gateway – A network gateway is an internetworking system capable of joining together two networks that use different base protocols. A network gateway can be implemented completely in software, completely in hardware, or as a combination of both. Depending on the types of protocols they support.

20. What is a communication protocol? What is its role in a network?

Ans. When computers communicate with each other, there needs to be a common set of rules and instructions that each computer follows. A specific set of communication rules is called a protocol.

The basic role of a protocol is to define what is communicated, how it is communicated and when it is communicated.

21. Write short note on: (i) HTTP (ii) TCP/IP (iii) FTP.

Ans.
- Hypertext Transfer Protocol (HTTP) which uses a set of rules to allow communication between a browser

and server. Generally this protocol use port 80.

- Transmission Control Protocol (TCP), which uses a set of rules to send and receive information packets with other Internet points.
- Internet Protocol (IP), which uses a set of rules to address each message so it reaches the correct destination.
- File Transfer Protocol (FTP), which uses a set of rules to allow transfer of files (uploading and downloading) between the user's computer and server. Generally this protocol use port 110.

22. **What is wireless computing? How is it different from mobile computing?**

Ans. Wireless refers to the method of transferring information between a computing device and a data source, without a physical connection.

Wireless Computing v/s Mobile Computing

Wireless computing	Mobile computing
Wireless refers to the method of transferring information between a computing device and a data source, without a physical connection.	Mobile computing refers to computing devices that are not restricted to a desktop.
Wireless computing is simply data communication without the use of a landline.	Mobile computing essentially refers to a computing device that is not always connected to a central network.
Involve a cellular telephone, a two way radio, a fixed wireless connection, a laser, or satellite communications.	Include laptops, newly created smart phones and also PDA's.
Computing device is continuously connected to the base network.	Communicate with a base location, with or without, a wireless connection.

23. **Write short notes on the following :**
(i) GSM (ii) CDMA (iii) WLL (iv) 3G (v) SMS (vi) EDGE (vii) UMTS.

Ans. **(i) GSM (Global System for Mobile Communications):** It is leading digital cellular system. In covered areas, cell phone users can buy one phone that will work anywhere the standard is supported. It uses narrowband TDMA, which allows eight simultaneous calls on the same radio frequency.
(ii) CDMA (Code Division Multiple Access): It is a digital cellular technology that uses spread-spectrum techniques. CDMA does not assign a specific frequency to each user. Instead, every channel uses the full available spectrum.
(iii) WLL (Wireless in Local Loop): WLL is a system that connects subscribers to the public switched telephone network using radio signals as a substitute for other connecting media.
(iv) 3G: 3G is a specification for the third generation of mobile communication of mobile communication technology. 3G promises increased bandwidth, up to 384 kbps when a device is stationary.
(v) SMS (Short Message Service): SMS is the transmission of short text messages to and from a mobile phone, fax machine and or IP address.
(vi) EDGE (Enhanced Data rates for Global Evolution): EDGE is a radio based high speed mobile data standard.
(viii) UMTS(Universal Mobile Telecommunications Service) : UMTS is a third-generation (3G) broadband, packet-based transmission of text, digitized voice, video, and multimedia at data rates up to 2 megabits per second (Mbps).

24. **Discuss the advantage and disadvantage of E-mail.**

Ans. Following are the advantage and disadvantage of E-mail.

Advantage :

- ✓ Inexpensive way to move information.
- ✓ Delivered mail very fast.
- ✓ Reducing clutter of paper in office.
- ✓ Easy to send email.

- ✓ Maintain records of communication with someone else.
- ✓ Email waits until you read it.

Disadvantage :

- ✓ Need computer to read or print email.
- ✓ Sent mail can be changed or deleted.
- ✓ Easy to sent a message that you latter regret.
- ✓ Hard to express emotions.

25. Ans. **Compare and Contrast (i) e-mail and voice mail (ii) e-mail and chatting.**

(i) **E-mail and voice mail**

Comparison :

- ✓ Both e-mail and voice-mail are used for communication.

Contrast :

E-mail	Voice mail
Written, may be read quickly or slowly, as the receiver desires	Oral, must be listened to at the speed it was delivered
May be stored on disk for future reference. Easy to access specific stored messages.	May be stored on tape for future reference. Hard to locate specific stored messages.
Preferred by visual learners	Preferred by auditory learners

(ii) E-mail and chatting.

Comparison :

- ✓ Both e-mail and chatting are used for communication.

Contrast :

- ✓ Chat occurs in near real-time while Email doesn't
- ✓ Chat is a type of software while Email is a protocol
- ✓ Chat requires the permission of both parties while Email does not
- ✓ Chat is typically software dependent while Email is not
- ✓ Chat needs accounts on the same provider while Email does not

26. Ans. **What is video conferencing? How is it related to networking?**

Video Conferencing is a two-way videophone conversation among multiple participants. To make use of video conferencing, you need to install a digital camera, video conferencing software and an internet connection.
It is related to networking due to multiple users are connected with each other while conferencing.

27. Ans. **What is web browser? What is a web server? How are these two related?**

A software application that enables to browse, search and collect information from the web known as web browser, web browsers are used at client side.
The web pages on the Internet are stored on the computers that are connected to the Internet. These computers are known as web servers.
Web browser and Web server are related in a way that web browser send request to the web server and web server responds to the requests made by web browsers and fulfill the request accordingly.

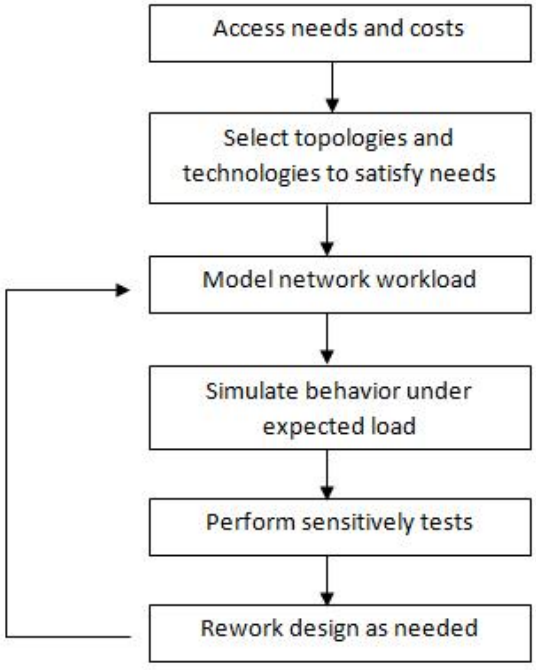
28. Ans. **Write short notes on URLs and domain names.**

- ✓ URL Stand for Universal Resource Locater.
- ✓ URL specifies the distinct address for each resource on the Internet, such as ftp, http etc.
- ✓ URL looks like this: type://adress/path.
- ✓ Where, - type specifies the type of the server in which the file is located.
- ✓ - address is a address of the server.
- ✓ - path is a location of the file on the server.
- ✓ An Internet address which is character based is called a Domain Name, such as com, org etc. Here com indicates Commercial and org indicates non-profit Organization.
- ✓ Two letter short form indicating the country name may be used with URL e.g., http://www.microsoft.co.in
  here the last in suggest that it is based in India.

29. Ans. **What is web hosting? What are its various categories?**

- ✓ Web Hosting is a means of hosting web-server application on a computer system.

	✓ By using web hosting electronic content on the Internet is readily available to any web browser client. ✓ The computer system providing the web-hosting is known as web-server or the web host. ✓ Web hosting can be classified into following four categories : **1. Free Hosting:** available with many famous sites which offer to host some web pages for no cost. **2. Virtual or Shared Hosting:** here one's web site domain is hosted on the web server of hosting company along with the other web sites. Use "shared" if you have a professional website. **3. Dedicated Hosting:** here, the company wishing to go online rents an entire web server from hosting company. This is suitable for large, high traffic sites. **4. Co-location Hosting:** here, the company owning the site instead of web hosting company. Suitable for those who need the ability to make change.
30.	**Explain briefly the following : (i) HTML (ii) XML (iii) DHTML**
Ans.	**HTML :** ✓ Stands for Hyper Text Markup Language. ✓ Used to design the layout of a document and to specify the hyperlinks. ✓ Tells the browser how to display text, pictures and other support media. ✓ Support multimedia and new page layout features. ✓ Provides many tags for control the presentation of information on the web pages, such as <body>, , <hr> etc. **XML:** ✓ Stands for eXtensible Markup Language. ✓ A markup language is a mechanism to identify structure in a document. ✓ XML defines a standard way to add markup to documents. ✓ Provides an ability to define tags and the structural relationship between them. ✓ All of the semantics of an XML document will either be defined by the application that process them or by style sheets. **DHTML :** ✓ Stands for Dynamic HTML. ✓ DHTML refers to web content that changes each time it is viewed. For example, graphic can move from one location to another, in response to user action, such as mouse click. ✓ Enable a web page to react to user input without sending request to web server. ✓ Used to describe the combination of HTML, style sheets and scripts that allow document to be animate
31.	**What do you understand by network security? Why is it considered very important?**
Ans.	Network security can be used to define the mechanism of providing security over network to the clients. Network security is considered very important because it is needed to protect data during their transmission and to guarantee that data transmissions are authentic. Two fundamental approaches are in use: conventional encryption and public-key encryption.
32.	**What is a firewall? Briefly explain different firewall techniques.**
Ans.	The system designed to prevent unauthorized access to or from a private network is called Firewall. There are several types of firewall techniques : ✓ **Packet filter:** Looks as each packet entering or leaving the network and accepts or rejects it based on user-defined rules. Packet filtering is fairly effective and transparent to users, but it is difficult to configure. ✓ **Application gateway:** Applies security mechanisms to specific application, such as FTP and Telnet servers. This is very effective, but can impose performance degradation. ✓ **Circuit-level gateway:** Applies security mechanisms when a connection is established. Once the connection has been made, packets can flow between the hosts without further checking. ✓ **Proxy server:** Intercepts all messages entering and leaving the network. The proxy server effectively hides the true network addresses.
33.	**What is hacking? What is cracking? How are these two terms inter-related?**
Ans.	✓ Hacking is an unauthorized/authorized access to computer/network in order to gather information of the actual user. ✓ Cracking is defined as the attempt to remove the copy protections inserted into software programs by the owner of software.

	✓ Hacking and Cracking both are related in a way that both unauthentically cause damage to the system.
34. **Ans.**	**Define the following :** **(a) Viruses (b) Worms (c) Trojan Horse (d) Spam (e) Cyber Crime (f) India IT Act 2000 (g) IPR** **(a) Viruses:** Computer virus is a malicious program that requires a host and is designed to make a system sick, just like a real virus. (b) **Worms:** Worms are self-replicating programs that do not create multiple copies of itself on one computer but propagate through the computer network. Worms log on to computer system using the username and password and exploit the system. (c) **Trojan Horse:** A Trojan horse is a code hidden in program such as game or spreadsheet that looks safe to run but has hidden side effects. (d) **Spam:** Spam refers to an unwanted generally commercial email sent to a large number of addresses. (e) **Cyber Crime:** Cyber crime involves the usage of computer system and the computer network for criminal activity. (f) **India IT Act 2000 :** In India the cyber laws are contained in the Information Technology Act,2000 which was notified on 17 October 2000 which was based on the United Nation's Commission for International Trade related laws(UNCITRAL) model law. (g) **IPR:** The Intellectual Property may be defined as a product of intelligence that has commercial value, including copyrighted property such as literacy or artistic works, and ideational property.
35. **Ans.**	**What is the general process of designing networks?** The general process of designing networks requires you to follow the steps as shown in following Fig :  **General Network Design Process**
36. **Ans.**	**While designing networks, what factors related to network environment would you consider?** While designing networks we would consider location of hosts, servers, terminals and other end nodes; the projected traffic for the environment; and the projected costs for delivering different service levels etc. factors related to network environment.
37. **Ans.**	**While designing networks, what factor related to performance, would you consider?** While designing networks we would consider network reliability, traffic throughput and host/client computer speeds etc. factors related to performance.
38. **Ans.**	**When would you prefer (i) hubs over repeaters (ii) bridges over hubs (iii) switch over others network devices ?** (i) We would prefer hubs over repeaters when the distance is less.

(ii) We would prefer bridges over hubs when we need to connect multiple networks.
(iii) We would prefer switch over others network devices when want to segment networks into different subnetworks to prevent traffic overloading.

39. When would you opt for a router in a network?

Ans. We would opt for a router in a network in when we want to connect different network of different protocol for example, a router can link Ethernet to a mainframe.

40. What is the difference between client-side scripting and server-side scripting?

Ans.

Client Side Scripting	Server-Side Scripting
Script code is downloaded and executed at client end.	The script is executed at the server-end and the result is sent to the client-end.
Response to the interactions is more immediate once the program code has been downloaded.	Complex processes are more efficient as the program and associated resources are not downloaded to the browser.
Services are secure as they do not have access to files and databases.	Have access to files and databases but have security considerations when sending sensitive information.
Browser dependent.	Does not depend on browser.
Affected by the processing speed of user's computer.	Affected by the processing speed of host server.
JavaScript, VBScript etc are Client Side Scripting languages.	PHP, Perl, CGI are Server Side Scripting languages.

41. How are viruses harmful? How can you prevent them?

Ans. Viruses' main objective is to make your system unstable and cause harm to data. Mainly these cause damage in many ways :

- ✓ Can corrupt entire file system?
- ✓ Create bad sector on a disk.
- ✓ Decrease the space on hard disk by duplicating files.
- ✓ Can format the entire disk.
- ✓ Alter data in data files.
- ✓ Cause the system to hang.

Following are guidelines for virus prevention :

- ✓ Never use unknown disk or CD without scanning.
- ✓ Scan files downloaded from the internet.
- ✓ Use licensed software.
- ✓ Never boot your PC from floppy.
- ✓ Make regular backups.
- ✓ Install and use antivirus software and keep it up to date.
- ✓ Protect your PC with password.

TYPE C: LONG ANSWER QUESTIONS

1. Internet is network of networks. How did it come into existence? How does it function?

Ans. **In following way internet was come into existence :**

- ✓ Evolution of networking started way back in 1969 by the development of first network called ARPANET. The goal of this project was to connect computers at U. S. defense & different universities.
- ✓ In 1980's, the NSFnet was started to make high-capacity network strictly for academic and engineering research
- ✓ In 1990sthe internetworking of ARPANET, NSFnet and other private networks resulted into Internet.

How Internet functions :

- ✓ Firstly the information or file to be sent to another computer is divided into small parts called Packets.
- ✓ Each packet is given a sequential number e.g. 1, 2, 3.
- ✓ Then packets are send to the address of destination computer.
- ✓ The destination computer receives the packets in randomly.
- ✓ Then packets are rearranged in their correct order and get actual information/file.

2. **Discuss various types of networks. Can you imagine the relationship of a LAN with a WAN? What is it? Discuss.**

Ans. There are three types of networks :

1 Local Area Networks (LANs) :

- ✓ Group of computers and network
- ✓ Communication devices interconnected within a geographically limited area, such as a building or a campus.
- ✓ transfer data at high speeds
- ✓ Key purpose is to serve its users in resource sharing.
- ✓ Hardware and software resources are shared.

2. Metropolitan Area Network (MAN) :

- ✓ Spread over city, for example cable TV networks.
- ✓ Purpose is sharing hardware and software resource among its users.

3. Wide Area Networks (WAN) :

- ✓ Spread across countries.
- ✓ Group of LANs that are spread across several locations and connected together to look like one big LAN.
- ✓ Facilitate fast and efficient exchange of information at lesser cost and higher speed.
- ✓ The largest WAN in existence is internet.

Yes, We can imagine the relationship of a LAN with a WAN. Actually, WAN can even be a group of LANS that are spread across several locations and connected together to look like one big LAN.

3. **Briefly discuss wireless and mobile computing and various techniques used for wireless and mobile computing.**

Ans. Wireless communication is simply data communication without the use of landlines. Mobile computing means that the computing device is not continuously connected to the base or central network.

Following are the various techniques used for wireless and mobile computing :

1. **GSM (Global System for Mobile Communications):** It is leading digital cellular system. In covered areas, cell phone users can buy one phone that will any where the standard is supported. It uses narrowband TDMA, which allows eight simultaneous calls on the same radio frequency.
2. **CDMA (Code-Division Multiple Access):** It is digital technology that uses spread-spectrum techniques. CDMA does not assign a specific frequency to each user. Instead, every channel uses the full available spectrum.
3. **WLL (Wireless in Local Loop):** WLL is a system that connects subscribers to the public switched telephone network using radio signals as a substitute for other connecting media.
4. **Email (Electronic Mail):** Email is sending and receiving messages by computer.
5. **Chat:** Online textual talk in real time is called chatting.
6. **Video Conferencing:** A two way videophone conversation among multiple participants is called video conferencing.
7. **SMS (Short Message Service):** SMS is the transmission of short text messages to and from a mobile phone, fax machine and or IP address.
8. **3G and EDGE:** 3G is a specification for the third generation of mobile communication of mobile communication technology. 3G promises increased bandwidth, up to 384 kbps when a device is stationary.
   EDGE (Enhanced Data rates for Global Evolution): EDGE is a radio based high speed mobile data standard.

4. **Define network security. What is its need? How can it be achieved?**

Ans. Network security can be used to define the mechanism of providing security over network to the clients.

Needs of network security :

- ✓ Prevent unauthorized access of different types of information.

- ✓ To clarify that the information is not unauthentic.
- ✓ Transferring of data in encrypted form.

Network security can be achieved by various types of protection methods like authorization, authentication, encrypted smart cards, biometric systems and firewall.

5.(a) **What is Repeater?**

Ans. A repeater is a device that amplifies a signal being transmitted on the network.

(b) **Expand the following terms with respect to networking :**

(I)FTP (ii)CDMA (iii) HTML (iv) SMS

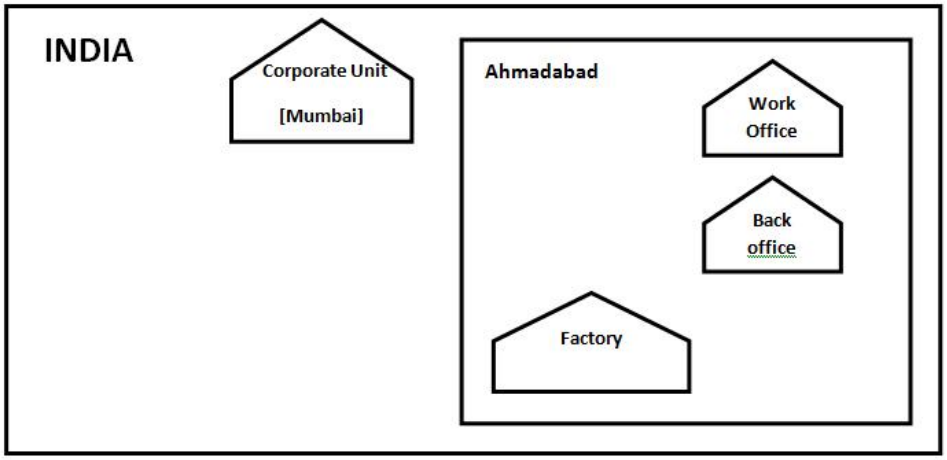
Ans. (i) FTP – File Transfer Protocol
(ii)CDMA – Code Division Multiple Access
(iii)HTML- Hypertext Markup Language
(iv)SMS – Short Message Service

(c) **How is an Email different from chat?**

Ans. Email is different from chat in following way :

- ✓ Chat occurs in near real-time while Email doesn't
- ✓ Chat is a type of software while Email is a protocol
- ✓ Chat requires the permission of both parties while Email does not
- ✓ Chat is typically software dependent while Email is not
- ✓ Chat needs accounts on the same provider while Email does not

(d) **"New York Avenue" is planning to expand their network in India, starting with two cities in India to provide infrastructure for distribution of their canned products. The company has planned to setup their main office in Ahmadabad, at three different locations and have named their office as "Work Office", "Factory" and "Back Office". The company has its Corporate Office in Delhi. A rough layout of the same is as follows:**



Approximate distance between these office is as follows:

From	To	Distance
Work Office	Back Office	110 Mtr
Work Office	Factory	14 KM
Work Office	Corporate Unit	1280 KM
Back Office	Factory	13 KM

In continuation of the above , the company experts have planned to install the following number computers in each of their offices:

Work Office	200

Back Office	115
Factory	67
Corporate	75

(i) **Suggest the kind of network required (out of LAN, MAN, WAN) for connecting each of the following office units:**
- **Work Office and Factory**
- **Work Office and Back Office**

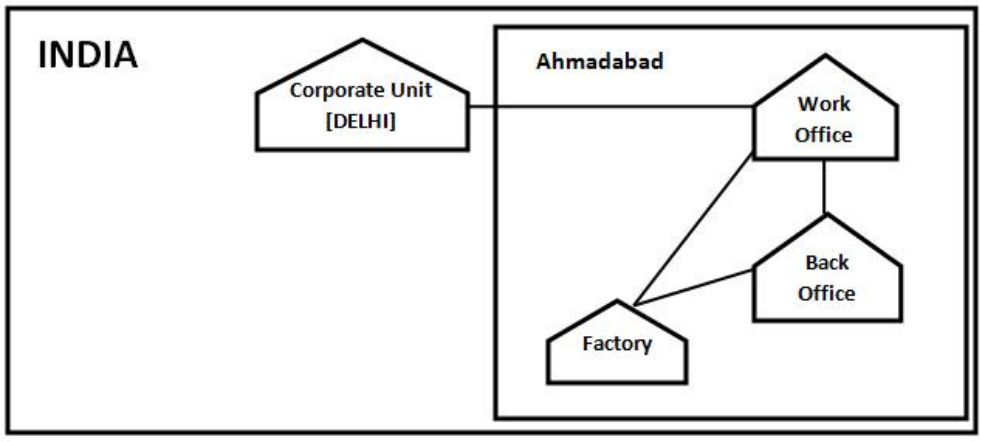
(ii) **Which one of the following device will you suggest for connecting all the computers with in each of their office units?**
- **Switch/Hub**
- **Modem**
- **Telephone**

(iii) **Which of the following communication media, you will suggest to be procured by the company for connecting their local office units in Ahmadabad for very effective (High Speed) communication?**
- **Telephone Cable**
- **Optical Fiber**
- **Ethernet Cable**

(iv) **Suggest a cable/wiring layout for connecting the company's local office units located in Ahmadabad. Also, suggest an effective method/technology for connecting the company's office unit located in Delhi.**

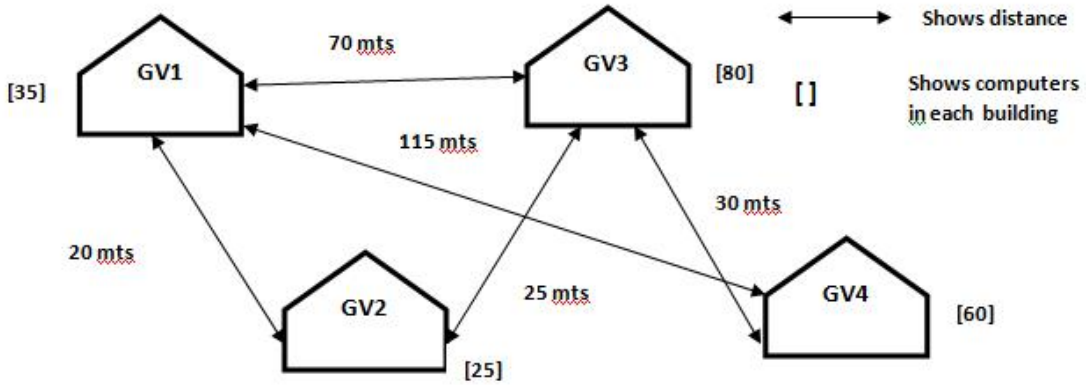
(v) **Which one of the following devices will you suggest for connecting all the computers within each of their offices?**
- **Switch/Hub**
- **Modem**
- **Telephone**

Ans. (i) Work Office and Factory – MAN
Work Office and Back Office – LAN
(ii)Switch/Hub
(iii)Optical Fibre
(iv)Suggested layout is shown in adjacent figure –



Technology for connecting to Delhi office – *Satellite.*
(v)Switch/Hub

6. **Global Village enterprises has following four buildings in Hyderabad city :**



Computers in each building are networked but buildings are not networked so far. The company has now decided to connect buildings also.

(a) **Suggest a cable layout for these buildings.**

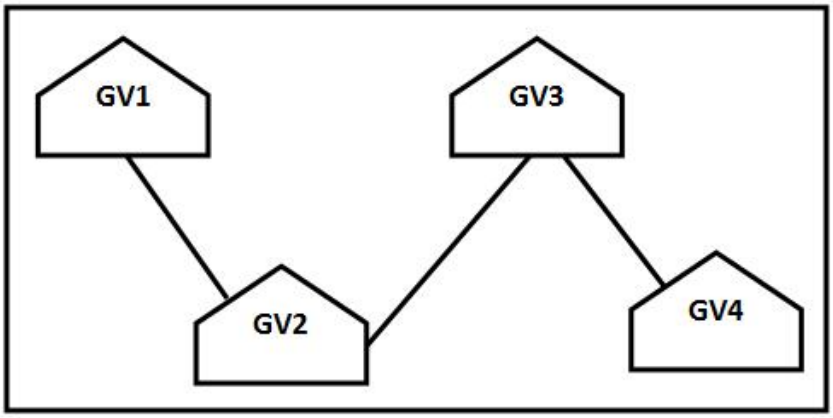
(b) **In each of the buildings, the management wants that each LAN segment gets a dedicated bandwidth i.e., bandwidth must not be shared. How can this be achieved?**

(c) **The company also wants to make available shared Internet access for each of the buildings. How can this be achieved?**

(d) **The company wants to link its head office in GV1 building to its another office in Japan**
(i) Which type of transmission medium is appropriate for such a link?
(ii)What type of network would this connection result into?

Ans.

(a) Suggested layout is shown in adjacent figure –



(b)By placing Switch in each building.

(c)By using Switch internet can be shared.

(d) (i)Satellite

(ii)WAN

7. (a) **Write two advantages and two disadvantages for STAR topology.**

Ans.

Advantage :

- ✓ Easy to install and wire.
- ✓ Easy to detect faults and to remove parts.

Disadvantage :

- ✓ Requires more cable length than a linear topology.
- ✓ More expensive than linear bus topologies because of the cost of the hubs, etc.

(b) **Write one difference between Telnet and FTP.**

Ans. FTP is a File Transfer Protocol, and its only concern is to facilitate the transfer of files from one point to another whereas Telnet is simply a connection protocol that allows a user to connect to a remote server that is listening for Telnet commands

(c)	**Explain the following terms in short :** **(i)DHTML (ii)ISP**
Ans.	(i) DHTML – Dynamic Hyper Text Markup Language (ii) ISP – Internet Service Provider
(d)	**Define Packet switching.**
Ans.	Packet switching is one of the switching techniques which refer to protocols in which messages are divided into packets before they are sent. Each packet is then transmitted individually and can even follow different routes to its destination. Once all the packets forming a message arrive at the destination, they are recompiled into the original message.
8. (a)	**Write two advantages and two disadvantages for STAR topology.**
Ans.	**Advantage :** ✓ Easy to install and wire. ✓ Easy to detect faults and to remove parts. **Disadvantage :** ✓ Requires more cable length than a linear topology. ✓ More expensive than linear bus topologies because of the cost of the hubs, etc.
(b)	**Write one difference between coaxial and optical cable.**
Ans.	✓ Coaxial cables have solid wire core surrounded by one or more foil or wire shields whereas optical fibres consists of thin strands of glass or glass like materials. ✓ Coaxial cables transmit electrical signals whereas Optical fibres transmit light signals or laser signals.
(c)	**Explain the following terms in short :** **(i)FTP (ii)URL**
Ans.	(i) FTP – File Transfer Protocol (ii)URL - Uniform Resource Locator
(d)	**Define Packet switching.**
Ans.	Packet switching is one of the switching techniques which refer to protocols in which messages are divided into packets before they are sent. Each packet is then transmitted individually and can even follow different routes to its destination. Once all the packets forming a message arrive at the destination, they are recompiled into the original message.
9. (a)	**What was the role of ARPANET in Computer Network?**
Ans.	ARPANET stands for Advanced Research Project Agency Network. It is a project sponsored by U. S. Department of Defense and planted in 1969 to connect computers at U. S. defense & different universities. In 1980s, NSFnet was started to make high capacity network, which are more capable than ARPANET. In 1990s the internetworking of ARPANET, NSFnet and other private networks resulted into internet.
(b)	**Which of the following is not a unit for data transfer rate?** **(i)bps (ii)abps (iii)gbps (iv)kbps**
Ans.	abps is not a unit for data transfer rate.
(c)	**What is the difference between Trojan Horse and Virus in terms of computers?**
Ans.	Computer virus is a malicious program that requires a host and is designed to make a system sick, just like a real virus whereas Trojan horse is a code hidden in program such as game or spreadsheet that looks safe to run but has hidden side effects.
(d)	**What term we use for a software/hardware device, which is used to block, unauthorized access while permitting authorized communications. This term is also used for a device or set of devices configured to permit, deny,**

encrypt, or proxy all (in and out) computer traffic between different security domains based upon a set of rules and other criteria..

Ans. Firewall.

(e) **Try it by yourself.**

(f) **Write the full forms of the following: (f1) GNU (f2) XML**

Ans. (f1) GNU – GNU's Not Unix.
(f2) XML - eXtensible Markup Language

(g) **Write one advantage of each for Open Source Software and Proprietary Software.**

Ans. Advantage of Open Source Software :
- ✓ Low cost and no license fees;

Advantage of Proprietary Software :
- ✓ Reliable, professional support and training available;

10. (a) **What is Modem?**

Ans. A modem is a computer peripheral that connects a workstation to other workstation via telephone line s and facilitates communications.

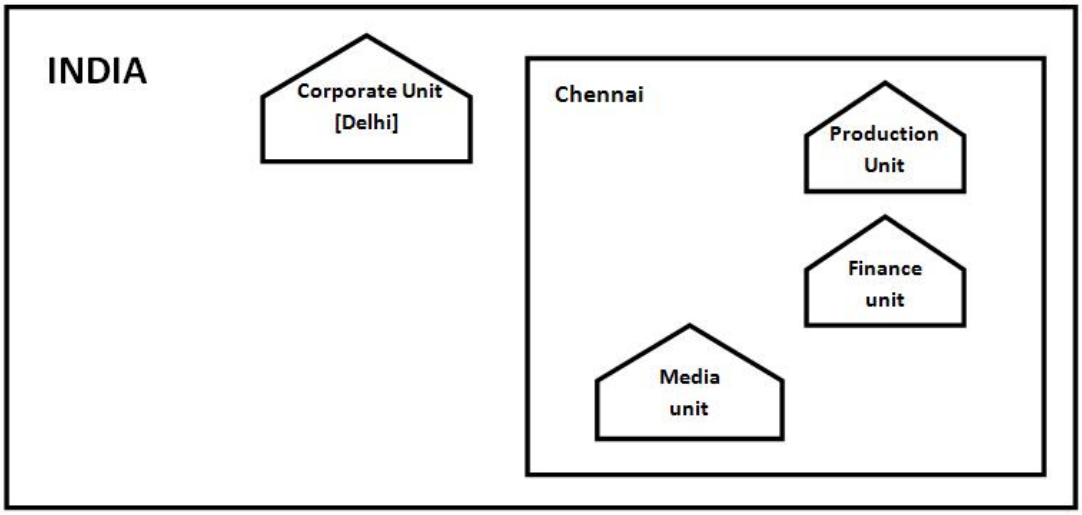
(b) **Expand the following terms with respect to Networking :**
(i) PPP (ii)GSM (iii)XML (iv)HTTP

Ans. (i) PPP - Point to Point Protocol
(ii)GSM – Global System for Mobile communication
(iii)XML - eXtensible Markup Language
(iv)HTTP - Hypertext Transfer Protocol

(c) **How is a Hacker different from a Cracker?**

Ans. Programmers who gain knowledge about computer system for playful pranks are known as Hackers whereas Crackers are malicious programmers who break into secure systems.

(d) **"China Middleton Fashion" is planning to expand their network in India, starting with two cities in India to provide infrastructure for distribution of their product. The company has planned to setup their main office in Chennai at three different locations and have named their office as "Production Unit", "Finance Unit" and "Media Unit". The company has its corporate unit in Delhi. A rough layout of the same is as follows:**



Approximate distance between these Units is as follows:

From	To	Distance

Production Unit	Finance Unit	70 Mtr
Production Unit	Media Unit	15 KM
Production Unit	Corporate Unit	2112 KM
Finance Unit	Media Unit	15 KM

In continuation of the above , the company experts have planned to install the following number computers in each of their offices:

Production Unit	150
Finance Unit	35
Media Unit	10
Corporate Unit	30

(i) Suggest the kind of network required (out of LAN, MAN, WAN) for connecting each of the following office units:
- ☞ **Production Unit and Media Unit**
- ☞ **Production Unit and Finance Unit**

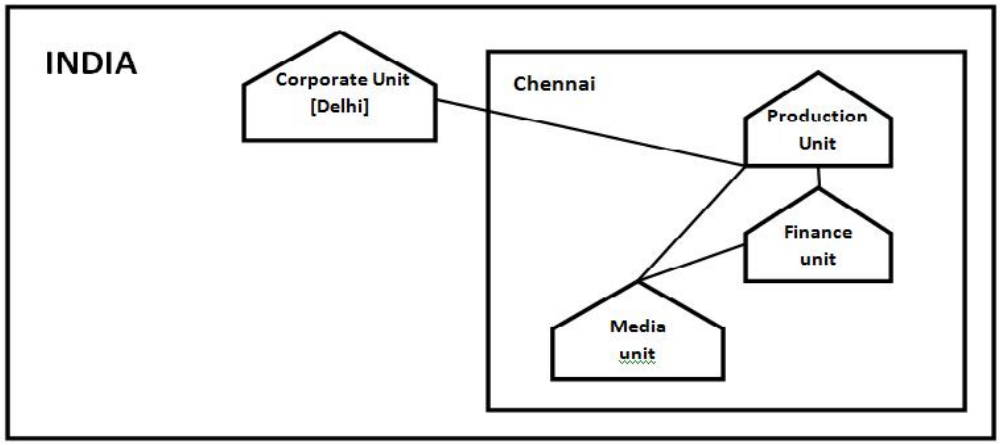
(ii) Which one of the following device will you suggest for connecting all the computers with in each of their units?
- ☞ **Switch/Hub**
- ☞ **Modem**
- ☞ **Telephone**

(iii) Which of the following communication media, you will suggest to be procured by the company for connecting their local office units in Chennai for very effective (High Speed) communication?
- ☞ **Telephone Cable**
- ☞ **Optical Fiber**
- ☞ **Ethernet Cable**

(iv) Suggest a cable/wiring layout for connecting the company's local office units located in Chennai. Also, suggest an effective method/technology for connecting the company's office unit located in Delhi.

Ans.

(i) Production Unit and Media Unit- WAN
Production Unit and Finance Unit- LAN
(ii) Switch/Hub
(iii) Optical Fiber
(iv) Cable/wiring Layout is:



Technology for connecting the company's office unit – *Satellite.*

11(a) **What is the significance of Cyber law?**

Ans. Cyberlaw is a generic term which refers to all the leagel and regulatory aspects of Internet and the World Wide Web. Anything concerned with or related to or emanating from any legal aspects or issues concerning any activity of

netizens and others, in Cyberspace comes within the ambit of Cyberlaw. The growth of Electronic commerce has propelled the need for vibrant and effective regulatory mechanisms which would further strengthen the legal infrastructure, so crucial to the success of electronic Commerce. All these regulatory mechanisms and legal infrastructures come within the domain of Cyberlaw.

(b) **Expand the following terms with respect to Networking :**

Ans. **(i)CDMA (ii)FTP (iii)WLL (iv)HTML**

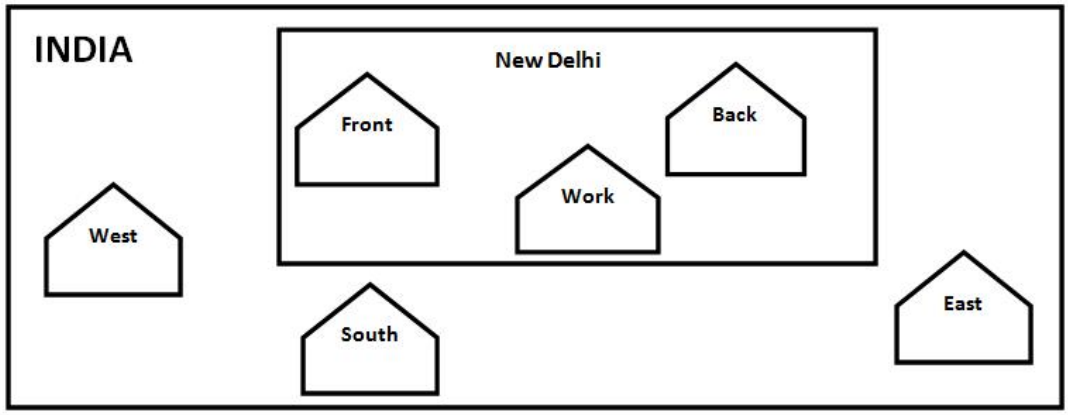
(i)CDMA – Code Division Multiple Access
(ii) FTP – File Transfer Protocol
(iii)WLL – Wireless in Local Loop
(iv) HTML – Hypertext Markup Language

(c) **Which of the following unit measures the speed with which data can be transmitted from one node to another node of network? Also, give the expansion of the suggested unit**

(i) Mbps (ii)KMph (iii) MGps

Ans. (i) Mbps. – Mega bytes per second.

(d) **"Bhartiya Connectivity Association" is planning to spread their office in four major cities in India to provide regional IT infrastructure support in the field of Education & Culture. The company has planned to setup their head office in New Delhi in three location and have named their New Delhi office has "Front Office", "Back Office" and "Work Office". The company has three more regional offices as "South Office", "East Office" and "West Office" located in other major cities of India. A rough layout of the same is as follows:**



Approximate distance between these office as per network survey team is as follows:

Place From	Place To	Distance
Back Office	Front Office	10 KM
Back Office	Work Office	70 Meter
Back Office	East Office	1291 KM
Back Office	West Office	790 KM
Back Office	South Office	1952 KM

In continuation of the above , the company experts have planned to install the following number of computers in each of their offices:

Back Office	100
Front Office	20
Work Office	50
East Office	50
West Office	50
South Office	50

(i) Suggest network type (out of LAN, MAN, WAN) for connecting each of the following set of their

offices:

- **Back Office and Work Office**
- **Back Office and South Office**

(ii) Which device you will suggest to be produced by the company for connecting all the computers with in each of their offices out of the following devices?

- **Switch/Hub**
- **Modem**
- **Telephone**

(iii) Which of the following communication medium, you will suggest to be procured by the company for connecting their local office units in New Delhi for very effective and fast communication?

- **Telephone Cable**
- **Optical Fiber**
- **Ethernet Cable**

Suggest a cable/wiring layout for connecting the company's local office located in New Delhi. Also, suggest an effective method/technology for connecting the company's regional office –"East Office", "West Office" and "South Office" with offices located in New Delhi.

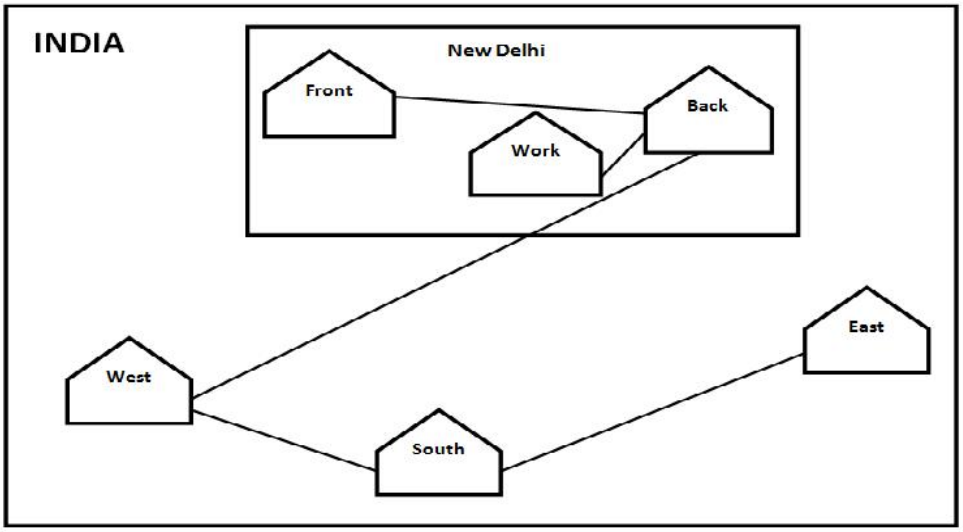
Ans.

(i) Back Office and Work Office-MAN
Back Office and South Office-WAN

(ii) Switch/Hub

(iii) Optical Fiber

(iv) Cable/wiring Layout is:



Technology for connecting the company's regional office – *Satellite*.

12(a) Differentiate between Internet and Intranet.

Ans. Internet is a network of computer network which operates world-wide using a common set of communication protocols. Internet is not owned by anybody.

Whereas Intranet is an inter-connected network within one organization that uses Web technologies for the sharing of information internally. Intranet is privately owned.

(b) Expand the following terms :

(i) CDMA (ii)URL (iii)HTTP (iv)WAN

Ans. (i)CDMA – Code Division Multiple Access
(ii)URL – Uniform Resource Locator
(iii)HTTP – Hyper Text Transfer Protocol
(iv)WAN – Wide Area Network

(c) Write one advantage of STAR topology as compared to BUS topology.

Ans. In STAR topology easy to detect faults whereas in BUS topology it is difficult to identify the problem if the entire

network shuts down.

(d) **Try it by yourself.**

13(a). **Name two transmission media for networking.**

Ans. Optical fibre and Coaxial cable.

(b) **Expand the following terms : (i) XML (ii) GSM (iii) SMS (iv) MAN**

Ans. (i) XML – eXtensible Markup Language
(ii)GSM - Global System for Mobile communication
(iii) SMS - Short Message Service
(iv) MAN – Metropolitan Area Network

(c) **Differentiate between Hackers and crackers?**

Ans. Programmers who gain knowledge about computer system for playful pranks are known as Hackers whereas Crackers are malicious programmers who break into secure systems.

(d) **INDIAN PUBLIC SCHOOL in Darjeeling is setting up the network between its different wings. There are 4 wings named as SENIOR(S), JUNIOR (J), ADMIN (A) and HOSTEL (H).**

Distance between various Wings

Wing A to Wing S	100 m
Wing A to Wing J	200 m
Wing A to Wing H	400 m
Wing S to Wing J	300 m
Wing S to Wing H	100 m
Wing J to Wing H	450 m

Number of Computers

Wing A	10
Wing S	200
Wing J	100
Wing H	50

(i) **Suggest a suitable Topology for networking the computer of all wings.**
(ii) **Name the wing where the server is to be installed. Justify your answer**
(iii) **Suggest the placement of Hub/Switch in the network.**
(iv) **Mention the economic technology to provide internet accessibility to all wings.**

Ans.

(i) Star or Bus or any other valid topology or diagram.
(ii) Wing S, because maximum number of computer are located at Wing S.
(iii) Hub/Switch in all the wings.
(iv)Coaxial cable/Modem/LAN/TCP-IP/Dialup/DSL/Leased Lines or any other valid technology.

14(a). **What is difference between Message Switching technique and Packet Switching technique?**

Ans. Message Switching – In this form of switching no physical copper path is established in advance between sender and receiver. Instead when the sender has a block of data to be sent, it is stored in first switching office, then forwarded later, one jump at a time.
Packet Switching – With message switching there is no limit on block size, in contrast packet switching places a tight upper limit on block size.

(b) **Expand the following terminologies :**
(i) TCP/IP (ii) XML (iii) CDMA (iv) WLL

Ans. (i) TCP/IP – Transmission Control Protocol/ Internet Protocol
(ii) XML - eXtensible Markup Language
(iii) CDMA - Code Division Multiple Access
(iv) WLL - Wireless in Local Loop

(c) **Write two applications of Cyber Law.**

Ans.	Two applications of Cyber Law are: (i) Digital transactions (ii) Activities on Internet.
(d)	**Try it by yourself.**
15(a).	**What is difference Star Topology and Bus Topology of network?**
Ans.	In STAR topology easy to detect faults whereas in BUS topology it is difficult to identify the problem if the entire network shuts down.
(b)	**Expand the following abbreviations :** **(i) GSM (ii) CDMA**
Ans.	(i) GSM – Global System for Mobile communication (ii) CDMA - Code Division Multiple Access
(c)	**What is protocol? Which protocol is used to search information from Internet using an internet browser?**
Ans.	A protocol means the rules that are applicable for a network or we can say that the common set of rules used for communication in network. HTTP (Hyper Text Transfer Protocol) is used to search information from Internet using an internet browser.
(d)	**Try it by yourself.**
16(a).	**What is difference between LAN and WAN?**
Ans.	LANs are interconnected within a geographically limited area, such as a building or a campus whereas WANs are spread across countries.
(b)	**Expand the following abbreviations :** **(i) HTTP (ii) ARPANET**
Ans.	(i) HTTP - Hyper Text Transfer Protocol (ii) ARPANET - Advanced Research Project Agency Network
(c)	**What is protocol? Which protocol is used to copy a file from/to a remotely located server?**
Ans.	A protocol means the rules that are applicable for a network or we can say that the common set of rules used for communication in network. FTP (File Transfer Protocol) is used to copy a file from/to a remotely located server.
(d)	**Name two switching techniques used to transfer data between two terminals (computers).**
Ans.	Two switching techniques are : (i) Message Switching (ii) Packet Switching
(e)	**Try it by yourself.**