Networking Conepts(Theory Questions)

Networking Concept – 1

- **Network: A collection of independent computers that communicate with one another over a shared network medium.**

  Applications of networks:

  – Resource Sharing: Data can be shared with a computer in the next room or on a different continent E.g. the Internet

  – Reliability: The presence of multiple computers means that if one computer becomes unavailable on the network (due to failure) another can be used to take over that computer's work.

  – Saving Money: Mainframe computers are 10 times faster but 100 times more expensive than PCs. Hence groups of PCs networked together can reduce costs (client-server model).

  – Improved Communication: People can work together and share ideas. Asynchronous communication: email more productive that phone, electronic document interchange and video conferencing.

- **Node: A computer attached to a network.**
- **Server: A computer that facilitates sharing of data, software and hardware resources on the network.**

  Server can be of two types:

  (A) Non-dedicated server - workstation can be double up as a server.

  (i) Resource sharing on small-scale

  (ii) Peer-to-Peer network

  (iii) Slower and requires more memory.

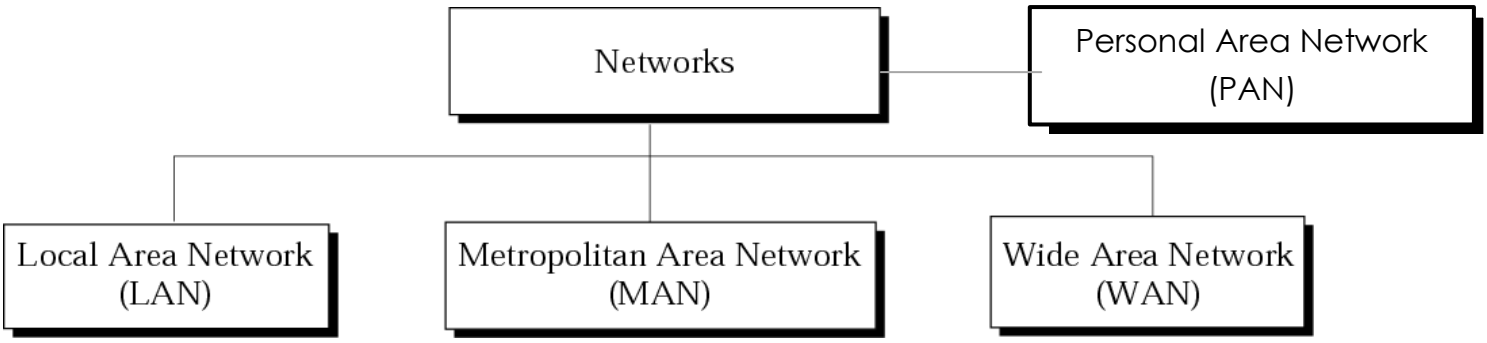
  (B) Dedicated Server – job of server is to help workstations access data, S/W and H/W resources.

  (i) Does not double up as a workstation

(ii) MASTER-SLAVE networks/ Client-Server networks.

(iii) Different type of servers – file server,printer server and modem server.

- **Interspace: A client/server software program that allows multiple users to communicate online with real time audio, video and text chat in dynamic 3D environments.**
- **Network Interface Unit (NIU): A device that helps to establish communication between the server and workstations.**



- **Local Area Network (LAN): A network in which the devices are connected over a relatively short distance.**
  - Privately owned networks
  - Used to connect PC's and workstations within a building or computers in an area up to 10 kms of range.
  - Speed of data, transmission is not very high.
  - Very low error rate.
  - Data rate of at least several mbps.
- **Metropolitan Area Network (MAN): A network which spans a physical area (in the range of 5 and 50 km diameter) that is larger than a LAN but smaller than a WAN.**
  - Bigger version of LAN
  - May be private or public
  - Covers a group of nearby offices or city

- **Wide Area Network (WAN): A network which spans a large geographical area, often a country or a continent.**
    - Spans a large geographical area
    - Public Network and owned by multiple organizations.
    - Speed very high and very high error rates.
    - Data rates less than 1 mbps.
- **Personal Area Network (PAN): A computer network organized around an individual person.**
- **Need for a network**
    - To break barriers of distance, cost & time
    - Sharing of data & resources
- **Difference between LAN and WAN**
    - The distance between the nodes is limited. There is an upper limit of approx. 10 Km. and lower limit is 1 km.
    - While WAN usually operates at speed of less than 1 mbps whereas LAN operate at between 1 and 10 mbps.
    - Because of short distances in LAN error rates are low.
- **Internet: It is a network of networks spread across the globe, all of which are connected to each other.**
- **Modes of data transmission:-**
    - **Analog or Broadband Transmission**
        - Signal is a radio frequency signal or analog i.e.- can consist of continuous electrical waves that are variable.
        - Telephone network s use This type of transmission
        - Requires modem for transmitting data over baseband medium.
    - **Digital or Baseband Transmission**
        - No special device for conversion of signal to be transmitted over baseband medium.
        - Signal is a group of discrete electrical units, which is transmitted , in rapid succession.
    - **Parallel Communication**

- When data is transmitted through multiple wires with each wire carrying each bit is called parallel communication

- **Serial communication**
  - When bits are sent one after another in a series along wire, it is called serial communication

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- **Synchronous or asynchronous Transmission**
  - When sender and receiver synchronize their checks before transmission i.e sender first sends control characters to the receiver and then sends the actual data, this is called Synchronous transmission .**Advantage**- Faster **Disadvantage**- Costly & complex setup required
  - In asynchronous transmission data is proceeded and succeeded by a start bit and stop bit respectively. No synchronization is required. **Advantage**- Simple and cheap hardware required **Disadvantage**- Slower than synchronous mode

- **Circuit switching:** A technique in which a dedicated and complete physical connection is established between two nodes for communication.
- **Message Switching:** Here, sender sends data to switching office where it is kept in disk until a free link to another switching office or destination is found. On finding out a path, data is further transmitted. Due to its working principle, it is also called store and forward switching. The problem is that the messages are stored on hard disk.
- **Packet switching:** A switching technique in which packets are routed between nodes over data links shared with other traffic.
- **Channel: A medium that is used in the transmission of a message from one point to another.**
- **Baud rate** refers to the number of times the condition of the line changes. This is equal to bits per second only if each signal corresponds to one bit of transmitted data. It is data transfer rate.

- **Bandwidth: The range of frequencies available for transmission of data.**
- **Following communication channels are used in network:**
    - **Guided Media –**
        - **Twisted Pair**
            - Consists of two insulated copper wires arranged in a regular spiral pattern to minimize the electromagnetic interference between adjacent pairs
            - Used for mostly office telephone wiring.
            - Data transmission characteristics are not very good due to high attenuation.
            - **Types of Twisted Pair -**
                - STP (shielded twisted pair) - the pair is wrapped with metallic foil or braid to insulate the pair from electromagnetic interference.
                - UTP (unshielded twisted pair) - each wire is insulated with plastic wrap, but the pair is encased in an outer covering.
            - **Advantages:**
                - Simple and inexpensive
                - Easy to install, because of physical flexibility, low weight and easy connectivity.
            - **Disadvantages:**
                - Signals loose energy due to attenuation, so repeaters are required.
                - Bandwidth is low, so unsuitable for broadband application.
                - Data transmission characteristics are not so good.\
        - **Coaxial cables**
            - Both conductors share a common center axial, hence the term “co-axial”.

- Coaxial cables consist of two wires: The first, a copper wire, surrounded by an insulator, the second is surrounded by a metallic cylinder called the shield. This design provides the coaxial cable with a special advantage: electrical interference is reduced because the two conductors are shielded and confined separately.
- Data transmission characteristics are better than twisted pair.
- Used for cable television, LANs, telephony.
- **Advantages:**
    - High Bandwidth and can be used for broadband transmission.
    - Excellent noise immunity
- **Disadvantages:**
    - Expensive compared to twisted pair cables.
    - Not compatible with twisted pair cables.
- **Types:**
    - Thick net (used for connecting nodes upto 500 m long
    - Thin net (maximum segment length of 185 meters

➢ **<u>Optical fibers</u>**

- These are then strands of glass or glass like material constructed to carry light from one source at one end fiber to a detector at other end
- Bandwidth potentially very high
- Data transmission rate is also high
- Very good transmission technology.
- **Advantages:**
    - Very high bandwidth
    - Reliable
    - It is immune to electrical and magnetic interference.
- **Disadvantages:**
    - Very costly

- Installation and setup is very complex
- They are impossible to tap coz of noise immunity

- **Unguided Media - Wireless Transmission –**

  - Transmission and reception are achieved by means of an antenna
  - **Directional**
  - transmitting antenna puts out focused beam
  - transmitter and receiver must be aligned
  - **Omnidirectional**
  - signal spreads out in all directions
  - can be received by many antennas

  - **Microwave**
    - Used in wireless communication
    - Required for long distance communication
    - Parabolic antennas are mounted on towers to send a beam to other antenna.
    - Higher the antenna greater the range.
    - Satellite Microwave Applications
    - Television distribution
    - Long-distance telephone transmission
    - Private business networks
    - **Advantages**
      - Cheaper than lying cables over distances.
      - It offers ease of communication over difficult terrain.
      - It offers freedom from land acquisition rights that are required for laying, repairing the cables.

    - Microwaves have the ability to communicate over oceans.
- **Disadvantages**
    - Signals from a single antenna may split up and propogate by slightly different paths to receiving antenna. These out of phase signals combine, they interfere.
    - Also affected by weather like rains, thunder storms etc.
    - The cost of design, implementation and implementation of its links is high
    - Repeaters are required.

➢ **Radio wave**

- Easy to generate
- Travel over long distances
- Used for communication both indoors and outdoors
- Waves are omnidirectional i.e. travel in all directions from sources to source destination need not to be physically aligned.
- It is cheaper than microwave.
- **Advantages**
    - Offers mobility
    - Cheaper than guided media
    - Ease of communication over difficult terrain
- **Disadvantages**
    - Signal frequency dependent

- At low frequency, signal pass through obstacles and power falls off.
- Subject to interference and weather conditions.

- **Infrared transmission**
  - Used for small area and in remote controls.
  - Infrared signals are highly modulated.
  - As for microwave alignment between sender and receiver is required.
  - It transmits data through the air but will not penetrate walls.
  - It provides a secure transmission.
- **Laser -** The laser Transmission requires direct line-of-sight. It is Unidirectional like microwave, but has much higher speed than microwaves than microwaves. The laser transmission requires the use of a laser transmitter and a photo-sensitive receiver at each end. The laser transmission is point-to-point transmission typically between buildings.
- **Satellite**
  - In this, there is a satellite & earth station communicating with the satellite.
  - Earth station has a satellite dish, which transmits & receives the signal. Satellite transmission is similar in principle to the ordinary radio link. Instead of having all the stations earthbound, we send some up into the space.

- Communications Satellite rotate at almost exactly the same rate as the earth rotate. Compared to the radio link, the satellite has a considerable large range. They are used for both in the national network and in the international network.
- **Advantages**
    - The area coverage is quite large.
    - It proves to be best alternative where laying and maintenance of intercontinental cable is difficult and expensive.
- **Disadvantage**
    - Costly
    - Over-crowding of available bandwidths due to low antenna gains.
    - Technological limitations prevent the use of large high gain antennas on the satellite platform.

Exercise Questions

1. What is a network? Give any two uses of having a network in your school computer lab.

2. Mention any two disadvantages of a network.

3. Two students in the same class sitting inside the same room have connected their laptops using Bluetooth for working on a group presentation. What kind of network have they formed?

4. Expand the following:

a. ARPANET. b. PAN c. NIU d. MAN

7. What are the requirements for setting up a network?

8. How is a dedicated server different from a non dedicated server?

9. Two companies in different states wanted to transfer information. Which type of network will be used to implement the same?

10. Two schools in the same city wanted to transfer e-learning information. Which type of network will be used to implement the same?

11. Two teachers in the same school sitting in different labs wanted to transfer information. Which type of network will be used to implement the same?

12. Define a protocol. Name any two protocols used on Internet.

13. Differentiate between :

a. Internet and Interspace

b. Circuit Switching and Packet Switching technique

c. LAN , WAN and MAN

14. Define a node and an NIU?

15. Define a channel. Name the three categories of communication channel.

16. What do you mean by bandwidth and DTR?

Networking Concepts – II

- **Transmission Medium: One which carries a signal from one computer to another.**
- **Wired Transmission Media: Twisted Pair, Coaxial , Fibre Optic , Ethernet cable**
- **Wireless Transmission Media: Radio waves , Microwaves, Bluetooth , WiFi, Satellites, Infrared**
- **Topology: The pattern of interconnection of nodes in a LAN.**

- **Factors affecting the topology used for a network are-**
    - COST- It imposes a limitation on the pattern of interconnection of nodes.
    - FLEXIBILITY- Topology should be easily reconfigurable involving addition and movement of nodes.
    - RELIABILITY –Topology should provide reliable communication even if one or two nodes have failed.
    - Fault Diagnosis.
    - Fault Tolerance.
- **Different Topologies are:-**
    - **BUS TOPOLOGY**- Also known as linear or multidrop topology. It consists mainly of main trunk known as Bus/ Backbone. It is a long twisted pair cable or coaxial cable into which nodes and peripheral are attached using drop cables. The two ends of backbone are terminated by absorbers to absorb signals from the cable after it has passed all the devices.

• **Advantages:** • Range of equipments can be attached. • New node can be added easily • Low cable costing as cable length • is short and simple wiring layout • Resilient Architecture.	• **Disadvantages:** • Single message can travel at a time. • Collision occurs in case of multiple transmission • Low reliability • Fault Diagnosis is difficult. • Fault isolation is difficult. • Repeater configuration and node must be intelligent.

    - **RING TOPOLOGY**

- Also known as daisy chain, It is circular cable. All nodes are connected to exactly two nodes to form a ring. All nodes are connected in a ring and data passes across each node in the system.

• **Advantages:-** • One node can transmit at a time. • Repeaters not required. • Short cable length and no wiring closet space required. • Suitable for optical fibers.	• **Disadvantages:-** • If one node fails network comes down. • Each node must be intelligent to hold data transmitted by other nodes. • Difficult to diagnose faults • Network configuration is difficult.

- **STAR TOPOLOGY**
  - Various nodes are connected to a directly wired central, dedicated computer known as Hub of star. The drop cables extend in all directions. All data transfer is via hub.

• **Advantages:** • Fault tolerant • Network management is easy. • Centralized control and easy problem diagnosis. • Simple access protocols.	• **Disadvantages:-** • Long cable length • Difficult to expand • Central node dependency.

- **TREE TOPOLOGY**
  - Passive branches can be added to groups or individual nodes in the sense that the original bus splits into a number of separate branches. The structure is as follows:
  - Other topologies are Graph, Mesh topology etc.

- Network Topologies: Bus , Star, Tree

- **Modem: A device that enables a computer to transmit data over, telephone or cable lines.**
- **Backbone- is central interconnecting structure that connects one or more networks just like the trunk or the spine of a human being.**
- **Bridge- It connects similar networks. It is a device that establishes an intelligent connection between two local networks with the same standard but with different types of cables.**
- **RJ-45: An eight wired connector used to connect computers on a LAN.**
- **Ethernet card: A kind of network adapter.**
- **Switch: A small hardware device that joins multiple computers together within a LAN.**
- **Repeater: An electronic device that amplifies the received signal and then retransmits it on the network.**
- **HUB- is a hardware device used to connect several computers together. Hubs can be either active or passive**
  - Active Hubs electrically amplifies signals, used like repeaters
  - Passive Hubs allow the signal to pass from one computer to another without any change.
- **Router: A network device that connects two networks with different protocols.**
- **Gateway: A network device that connects two dissimilar networks.**
- **Wi-Fi card: A small, portable card that allow your computer to connect to the internet through a wireless network.**

Exercise Questions

1. What do you mean by a transmission medium? Differentiate between guided and unguided transmission media.

2. Explain the structure of a coaxial cable and a fibre optic cable.

3. What are advantages of fiber optic cable?

4. Differentiate between a radio wave transmission and a microwave transmission.

5. Explain satellite communication. What are the advantages and disadvantages of using satellite communication?

6. Define the term topology.

7. List any two advantages and any two disadvantages of Star topology.

8. How is Tree Topology different from Bus topology?

9. Identify the type of topology from the following.

a. Each node is connected with the help of single cable.

b. Each node is connected with the help of independent cable with central switching.

10. What do you mean by a modem? Why is it used?

11. Explain the following devices:

a. Switch b. Repeater c. Router d. Gateway e. Wi-Fi Card

12. Show a network layout of star topology and bus topology to connect 4 computers.

13. Ms. Anjali Singh, in charge of Knowledge centre in ABC school, recently discovered that the communication between her centre and the primary block of the school is extremely slow and signals drop quite frequently. The distance between these two blocks is 140 meters.

a. Name the type of network.

b. Name the device which may be used for smooth communication.

14. ABC International School is planning to connect all computers, each spread over distance of 50 meters. Suggest an economic cable type having high speed data transfer to connect these computers.

15. Sahil wants to transfer data across two continents at very high speed. Write the name of the transmission medium that can be used to do the same. Write the type of network also.

16. Mayank wants to transfer data within a city at very high speed. Write the name of the wired transmission medium that he should use. Write the type of network also.

17. Mr. Akash wants to send/receive email through internet. Which protocol will be used for this purpose?

18. Answer the following questions in the context of a computer lab with 100 computers.

a. Which device is used to connect all computers inside the lab?

b. Which device is used to connect all computers to the internet using telephone wire?

19. Name the device that establishes an intelligent connection between a local network and external network with completely different structures.

20. Name the network device that works like a bridge to establish connection between two networks but it can also handle networks with different protocols.

Network Protocols

- **Protocol: A special set of rules that two or more machines on a network follow to communicate with each other.**
- **Transmission Control Protocol (TCP): It breaks the data into packets that the network can handle efficiently.**
    - TCP splits messages into fixed size datagram which are then tagged with destination address and sent to receiver where the datagram are merged to form proper message.

- **Internet protocol (IP): It gives distinct address (called IP address) to each data packet.**
- **File Transfer Protocol (FTP): It is used for transferring files from one system to another on the internet.**
    - to promote sharing of files(computer program/data)
    - to encourage indirect use of computers
    - to transfer data
- **Hyper Text Transfer Protocol (HTTP): It is the protocol that is used for transferring hypertext files on the World Wide Web.**
    - A set of requests from browsers to servers
    - A set of responses from server to browsers
- **Point-to-Point Protocol (PPP): It is used for communication between two computers using a serial interface.**
    - LCP-Link Control Protocol. It is used for link establishment, configuration and testing.
    - NCP- After establishment of a link, one or more network connections can be used to transfer traffic on a line.
- **Simple Mail Transfer Protocol (SMTP): It allows transmission of email over the Internet.**
- **Post Office Protocol 3(POP3): It receives and holds email for an individual until they pick it up.**
- **IP is the protocol controlling addressing on the network. As and when any computer gets connected to the network, it must owe a unique address with which it will be identified by other systems. IP protocol assigns address to the different system on the network.**
- **SLIP (Serial Line Internet Protocol) - It was the first protocol used on dialup lines for sending and receiving packets on the network. It does not have support for dynamic address assignment so is not used nowdays.**
- **Telnet: A protocol for creating a connection with a remote machine.**
- **IRC: IRC protocol is used for chatting. It is based on client/server model.**

- **VOIP: VOIP stands for voice over internet protocol. It enables the transfer of voice using packet switched network rather than using public switched telephone network.**

Exercise Questions:

1. Expand the following abbreviations:

FTP, TCP,SMTP,VoIP

2. What do you mean by the term Protocol Independence?

3. Write short notes on:

a) TCP/IP b) HTTP c) SMTP d) FTP e) Telnet 4. List three important features of HTTP.

5. Explain VOIP.

6. Explain IRC

7. Neha wants to upload and download files from/to a remote internal server. Write the name of the relevant communication protocol, which will let her do the same.

8. Meha wants to upload hypertext document on the internet. Write the name of protocol, which will let her do the same.

9. This protocol is used for communication between two personal computers using a serial interface and connected by a phone line. Write the name of the protocol.

10. This protocol is used to transfer email over internet. What is the name of the protocol?

11. This protocol is used to implement remote login. What is the name of the protocol?

12. This protocol is used for chatting between two groups or between two individuals. Write the name of the protocol.

13. This protocol is used to transfer of voice using packet switched network. Write the name of the protocol.

14. Explain Remote Access Protocol.

15. Why we need VoIP protocol?

16. Differentiate between FTP and HTTP.

17. Differentiate between VoIP and IRC.

18. Write the basic hardware requirements for VoIP.

19. Why TCP/IP based applications are considered to be stateless?

20. FTP is based on Client/Server principle. Explain.

Mobile Telecommunication Technologies,

- **1G Mobile Systems: The 1G Mobile System was introduced in late 1970s and early 1980s.The 1G mobile system was based on the analog cellular technology. They only had voice facility available.**
- **2G Mobile Systems: They used digital signals for transmissions of voice. 2G enabled the mobile systems to provide paging, SMS, voicemail and fax services.**
- **3G Mobile Systems: The 3G technology adds multimedia facilities to 2G phones by allowing video, audio,and graphics applications.**
- **4G Mobile Systems: 4G will provide better-than-TV quality images and video-links.**
- **Virus: Virus is a malicious program that attaches itself to the host program. It is designed to infect the host program and gain control over the system without the owner's knowledge.**
- **Worm: Worm is also a malicious program like a virus. But unlike viruses, it does not need to attach itself to a host program. A worm works by itself as an independent object.**

- **Trojan horse: A Trojan horse is a program that contains hidden malicious functions. Trojan Horses trick users into installing them by appearing to be legitimate programs.**
- **Spam: The term spam means endless repetition of worthless text. In other words, unwanted messages or mails are known as Spam.**
- **Cookies: This small text file is a cookie. Generally a cookie contains the name of the website that it has come from and a unique ID tag.**
- **Firewall: A firewall is hardware or software based network security system. It prevents unauthorized access (hackers, viruses, worms etc.) to or from a network.**
- **Cyber Crime: Cybercrime is defined as a crime in which a computer and internet is used in an illegitimate way to harm the user.**

  The list of Cyber Crimes includes

  1) harassment by computer (Cyber Stalking, defamation)
  2) pornography
  3) illegal downloads, plagiarism
  4) software piracy/counterfeiting, copyright violation of software, counterfeit hardware, black market
  5) sales of hardware and software, theft of equipment and new technologies
  6) fraud (credit card fraud, fraudulent use of ATM accounts, stock market transfers, telecommunications
  7) fraud), theft of (electronic) money
- **Cyber Law: Cyber law is an attempt to integrate the challenges presented by human activity on the internet with legal system of laws applicable to the physical world.**
- **Intellectual property rights are the rights given to an individual over the invention of their own. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time**

- **Intellectual property rights (IPR) Issues: Intellectual property rights are the rights given to an individual over the invention of their own. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time. There are only three ways to protect intellectual property**
    - Patents
    - Copyrights
    - Trademark
- **Hacking: The term was used for people who engaged themselves in harmless technical experiments and fun learning activities.**
- **Cracking: Cracking can be defined as a method by which a person who gains unauthorized access to a computer with the intention of causing damage.**
- **HyperText Transfer Protocol (HTTP): HTTP is the protocol that is used for transferring hypertext (i.e. text, graphic, image, sound, video etc.) between two computers and is particularly used on the World Wide**
- **Web. It is a TCP/IP based communication protocol and provides a standard for Web browsers and servers to communicate.**
- **WWW (World Wide Web): WWW can be defined as a hypertext information retrieval system on the Internet. Tim Berners -Lee is the inventor of WWW. WWW is the universe of the information available on the internet.**
- **Web page: Web page is an electronic document designed using HTML. It displays information in textual or graphical form. It may also contain downloadable data files, audio files or video files.**
- **A web page can be classified into two types:**
    - Static web page: A web page which displays same kind of information whenever a user visits it, is known as a static web page. A static web page generally has.htm or .html as extension
    - Dynamic web page: An interactive web page is a dynamic webpage. A dynamic web page uses scripting languages to display changing content on the web page. Such a page generally has php, .asp," or .jsp as extension.

- **Client-Side Scripting :On some web pages the contents change in response to an action done by the user, for example a click from the mouse or a key press from a keyboard action. Such pages use client-side scripting. In this technology, the content is generated on the user's local computer. VB Script and Java Script are examples of client-side scripting languages.**
- **Server -Side Scripting : Some web pages use applications running on the server to generate the web content. Such pages use server-side scripting language. Web page display the current time and date, forums, submission forms, shopping carts etc., use server-side scripting. ASP,JSP, PHP are examples of server-side scripting languages.**
- **Website: Related webpages from a single wen domain is termed as a website. A website has multiple webpages providing information about a particular entity.**
- **Web browser: Web browser is software program to navigate the web pages on the internet. A browser interprets the coding language of the web page and displays it in graphic form.Web Browser is of two types: Text Based and Graphics Based**
- **URL (Uniform resource locator): Web address of the web page written on the address bar of the browser is known as the uniform resource locator (URL).**
- **Web hosting: Web hosting is the process of uploading/saving the web content on a web server to make it available on WWW.**
- **Web 2.0: Web 2.0 refers to new generation of dynamic and interactive websites. Web 2.0 websites uses a new programming language called AJAX (Asynchronous JavaScript and XML)**
    - **<u>Applications supported by web 2.0 are as followings:</u>**
        - blogging
        - social bookmarking
        - RSS
        - wikis and other collaborative applications
        - interactive encyclopaedias and dictionaries
        - Advanced Gaming

Exercise Questions

1. Differentiate between SMTP and POP3.

2. Give the full forms of the following terms:

CDMA,TDMA,FDMA

3. Briefly explain the generations in Mobile technologies.

4. Differentiate between Worm and Virus

5. Explain different types of viruses briefly.

6. Explain the following terms:

Spam, Cookies, Firewall

7. Explain the significance of IT Act.

8. Explain the following terms:

- Patent
- Copyright
- Trademark

9. Differentiate between hacking and cracking

10. Mona is confused between the terms Domain name and URL. Explain the difference with the help of suitable example.

11. Identify the Domain name and URL from the following.

http://www.ABCSchool.in/home.aboutus.hml

12. Mr. Rohan wants to prevent unauthorized access to/from his company's local area network. Write the name of the system, which he should install to do the same.

13. Define the following with reference to threats to network security.

(i) Worm (ii) Trojan Horse

14. In this mode, each user has its own frequency domain. Write the name of this accessing mode.

15. In this mode, each user is allocated with a unique code sequence. Write the name of this accessing mode.

16. In this mode, each user is allowed to transmit data only within specified time intervals. Write the name of this accessing mode.

17. It means endless repetition of worthless text. In other words, it contains unwanted messages or mails. What is the name of this concept?

18. When the user browses a website, the web server sends a text file to the web browser. What is the name of this?

19. It is defined as a crime in which a computer and internet is used in an illegitimate way to harm the user. What is the name of this crime?

20. A person who gains unauthorized access to a computer with the intention of causing damage. What is the name of this crime?

21. Differentiate between HTML and XML?