Task 1- to explain the needs for different computer network types and models

Computing network types-

Computer networks are pile of computers linked together whose main purpose is to share resources. Exchange of data takes place using the connection between the nodes in computing network. People can share files and documents when computers are joined in networks like printers, CD-ROM, modems etc.

There are several types of computer networks and they are:

1) **Personal Area Network-** PAN normally connects devices within an user's area. Therefore it is a network which connects electronic devices with an individual user's range. For example bluetooth.

Advantages

- PANs are efficient,
- cost-effective and convenient.
- It is easy to use.
- No advanced setup is required

2) **Local Area Network (LAN):** Mostly, a LAN is enclosed in a single room or building but however, one LAN can be connected to other LANs over any distance through telephone lines and radio waves.

Advantages

- Cost-effective.
- It saves time and makes work faster

Disadvantage

- Data security problem
- LAN is expensive to set up because of the special software which is required to make a server.

3) **Wide Area Network (WAN):** a communications network which covers large areas upto cities,

states, or countries. Big organizations like the governments, education, businesses use WAN's for sharing information with students, clients, employee, workers, etc.

Advantages

- A lot of web applications are available for communication purpose.

Disadvantages

- Security problems
- The setup cost can be high

4.Metropolitan Area Network (MAN): A MAN is a network which interconnects users with computer resources and refers to a network of computers within a City.

Advantages:

- Less expensive
- High Security

Disadvantages:

- Can be hacked easily

There are many characteristics of network types that have been discussed below

A. Intranet- it is a private network which is conduct by a large organization and which used technologies related to the internet but it is covered up by the global internet. for example HR intranet, education intranet, non-profit intranet etc
B. Extranet- an extranet is also an intranet but it is accessible to few people outside the organization or it is shared by more than one organization. For example project extranet, supplier extranet etc.
C. Internet- internet is a global system which is providing information and communication facilities on a large scale. Internet consists of interconnected networks by using standard communication protocols. For example mail, online messages, emails, web etc.
D. Cloud- cloud refers to the servers that have access to the internet, and the software and databases that run on those servers. For example drive, dropbox etc.

The types of network models are-

Peer to peer, through the Internet, the computers (peer) are connected to each other. Documents can be transferred directly among the system on the network without any central server. A p2p network can be a file server as well as a client.

Thin client is a computer that has no processing power. Unlike a desktop the CPU, memory, and hard drive power come from a server or server farm.

The client-server model can be described as a server that provides one or more than one user with services and resources. Examples can be mail server, file server and web server

Task 2 explaining the characteristics and functions of network components

A computer network can be formed from many components. When together, these components make it feasible to transfer data from one device to another which helps to make a smooth communication between two different devices.

A network component can be of two types, they are:

1. Hardware components
2. Software components

1) Hardware components consists of different kind of elements such as,

- **End user devices**- An end user device is a personal computer or a personal device that can store information. For example- laptop, PC, mobile phones etc.
- **Connectivity devices**- most of the networks are small even the larger networks are divided into small network segments. Those small segments are separated from the large networks by devices that can assist the network to work more efficiently. The devices that help the network to work more efficiently are called connectivity device.

  For example, a *router* is a connecting device that helps to transfer data packs from several computer networks. The router connects an organization's LAN to a broadband internet connection to other devices.

  A *switch* is used to collect a signal which restores the signal before retransferring, so that the signal can travel longer distances.

  Another device can be a *hub*. This is a multiport device containing several input and output ports, so that the input at any port can be available at every other port.
- **Connection media**- connection media refers to the system of receiving and delivering the data or information. We need cables like optical fibre, co-axial, LAN cables for connecting the media and devices for internetworking

In order to connect hardware components through IP addresses we need network interference card. A network interference card or a NIC is a hardware device without which a computer will not connect to any network. It is a circuit board that is put in a computer which gives a firm network connection.

Software components-

- **Network system software-** networking software is a developing element for any network. The software helps the user to locate and manage the network. One needs to install an operating system first to access the device such as, Windows 10, 8, 7, Linus, Mac etc.

- **Network applications-** network applications are invented for different purposes. Network applications are applications running on one host providing communication to another application