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**SUBJECT: Computer Networks**

1 . What is a Computer Network ?

Answer: A computer network is a system that connects two or more computing devices for transmitting and sharing information. Computing devices include everything from a mobile phone to a server. These devices are connected using physical wires such as fiber optics, but they can also be wireless.

2. Define Nodes and Communication Link.

Answer : A network node is a connection point in a communications network. Each node is an endpoint for data transmissions or redistribution. Nodes have either a programmed or engineered capability to recognize, process and forward transmissions to other network nodes.

3. What are end devices and intermediary devices?

Answer:

End devices :

The network devices that people are most familiar with are called end devices. All computers connected to a network that participate directly in network communication are classified as hosts. These devices form the interface between users and the underlying communication network.

Some examples of end devices are:

- computers (workstations, laptops, file servers, and web servers)
- network printers
- VoIP phones
- TelePresence endpoints
- security cameras
- mobile handheld devices (smartphones, tablets, PDAs, and wireless debit/credit card readers and barcode scanners) sensors such as thermometers, weight scales, and other devices that will be connected to the IoT.

#### 4. What are the basic characteristics of computer networks.

Answer:

##### Basic characteristics of a Computer Network

##### Security:

Security is one of the most essential characteristics of a computer network. Most businesses nowadays rely on computers, which are accessed through networking. As a result, if computer network technology is not robust and secure, unauthorised access to the company's critical data might be possible. However, nowadays, computer networking tools primarily provide the highest level of security and prevent any unauthorised access.

##### Reliability:

Computer networks are very reliable tools, and users can easily interconnect their devices with the help of this. Computer networks have alternative sources of supply to provide high reliability. Their networking experience remains consistent even if users need to print, check messages, attend a meeting, or access data from another computer.

##### Scalability :

Scalability refers to the ability to scale up in response to changing needs while maintaining high performance. The internet is the best example of scalability; many new users connect via the internet and communicate with other devices, but our network still works properly.

##### Flow of Data :

Users can access and transmit data such as files, documents, and other types of information with the help of computer networking. It is a crucial feature of a computer network as it allows data to flow from one device to another.

##### High performance :

The performance is evaluated using the time required by a command. If it requires less time to transfer the data and the response is quick, it is a significant advantage for the users to transfer data and use multiple resources. The performance can be increased using multiple processors.

**Fault tolerance :**

Fault tolerance is also a great feature offered by computer networks. Let's suppose two devices are connected with both wired and wireless mediums. If the sender's device sends the information, and the receiver's device has a blockage at its wireless medium. It will find the other best alternative medium to send the information to the receiver's device, which is a wired medium in this case. Using this, they can continue to work even if the networking is down or damaged. This is how fault tolerance works.

**Quality of Service (QoS) :**

It means users can prioritize and customize their data transmission while also minimizing any transmission delays. It also allows for the loss of any data if it occurs regularly. As a result, another feature of a computer network is that it provides a high level of service to its users.

**5. Describe why we need fault-tolerance, scalable, QoS and securable networks?**

**Answer:**

**Fault-tolerance :**

The objective of creating a fault-tolerant system is to prevent disruptions arising from a single point of failure, ensuring the high availability and business continuity of mission-critical applications or systems.

**Scalable :** Network scalability refers to how well a network can handle sudden changes in workload brought about by sudden spikes or drops in the volume of data it processes.

**QoS :**

QoS helps businesses prevent the delay of these sensitive applications, ensuring they perform to the level that users require. For example, lost packets could cause a delay to the stream, which results in the sound and video quality of a videoconference call to become choppy and indecipherable.

**Securable networks :** Network security is important for home networks as well as in the business world. Most homes with high-speed internet connections have one or more

wireless routers, which could be exploited if not properly secured. A solid network security system helps reduce the risk of data loss, theft and sabotage.