Assignment 1

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Subject: Computer Networks

Part A (Multiple choice Questions)

Ques 1 (a) Topology
Ques 2 (b) Switch
Ques 3 (c) Optical fiber
Ques 4 (b) Transport layer
Ques 5 (a) Circuit switching
Ques 6 (c) SMTP
Ques 7 (d) PATCH
Ques 8 (a) 25
Ques 9 (B) QUIT
Ques 10 (a) attach multimedia to mail message

Part B (Descriptive Questions)

Ques 1 Data Communication

Data communication refers to the process of exchanging data between two or more devices via a medium such as wires, cables or wireless channels. It involves the transmission of digital or analog signals to convey information from the sender to the receiver. Data communication is a crucial aspect of information technology and plays a vital role in connecting computer, devices and networks.

Five components of Data communication:

1. Message → The information or data which is communicated
2. Sender → Device or entity that initiates the communication process by creating and sending the message.
3. Receiver → The device or entity that receives the messages sent by sender.
4. Transmission Media → Physical & logical pathway through which the message travels from the sender to receiver. This can include cables, fiber optics, wireless channels.
5. Protocol → A set of rules and conventions that govern the format and meaning of the data being transmitted, ensuring proper communication between sender & receiver.

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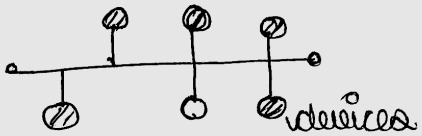
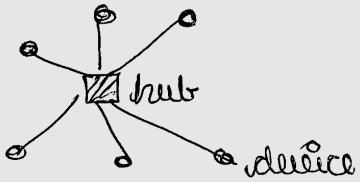
Ques 2 **Network Topologies**

Network topologies refer to the physical or logical layout of the connected devices in a network. Some common topologies include:

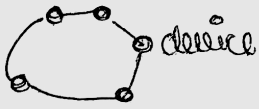
① **Bus Topology** : all devices share a common communication line.



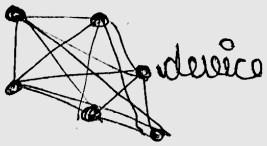
② **Star Topology** : all devices are connected to central hub or switch



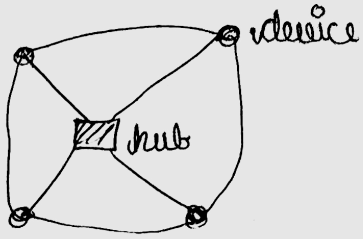
③ **Ring Topology** : all devices are connected in a circular ring.



④ **Mesh Topology** : all devices are interconnected, often with redundant paths for improved reliability.



⑤ **Hybrid Topology** : combination of two or more different topology.



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Ques 3 Internet services

Some of the services provided by the internet are:

1. World wide web : Lets users to access & navigate through web pages
2. Email : Electronic mail services for sending & receiving messages.
3. File Transfer Protocol : Facilitates the transfer of files between computers.
4. Instant Messaging : Real time communication through text messages.
5. Voice over Internet Protocol : Enables voice communication over the internet.

Ques 4 Media used for Data Transmission

1. Twisted Pair cable : Consists of pairs of insulated copper wires twisted together. Commonly used for telephone lines and LANs.
2. Coaxial cable : Contains a central conductor surrounded by insulating layers and a metallic shield. Used for cable television and broadband internet.
3. Fiber Optics cable : Transmits data as pulses of light through thin strands of glass or plastic fibers. Offers high bandwidth and is resistant to electromagnetic interference.
4. Wireless Transmission : Uses radio waves or infrared signals for communication. Examples use WiFi, Bluetooth & satellite communication.

Ques 5 Web caching & its benefits

Web caching involves storing copies of web documents or data strategically located servers to reduce the load on the original server and improve access speed. Benefits of web caching include

1. Faster access → Because content is cached it can be accessed faster.
2. Reduced server load → Each time the request doesn't go to server
3. Bandwidth saving → Because request doesn't go to server everytime
4. Improved scalability → Caching also make web services scalable.
5. Enhanced User Experience → Because entire network round trip is not necessary anymore, therefore the user experience and the responsiveness increases