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Ans 1a) IP address : 200.168.10.20/28

This belongs to class C.

∴ Default subnet mask for class C is
255.255.255.0

11001000	.	10101000	.	00001010	.	00010100
11111111	.	11111111	.	11111111	.	11110000
<hr/>						
11001000	.	10101000	.	00001010	.	00010000

200.168.10.32/28

∴ Network address of IP address 200.168.10.20/28
is 200.168.10.32/28

Ans 1 c) Connection less and connection oriented services

Connection-less services are similar to postal system where packets moves from one party to another without establishing a connection first. These services do not include connection establishment and connection termination.

Connection-oriented services are similar to telephone system where parties use handshake method to establish connection between sender and receiver. These services include connection establishment and connection termination.

Ans 1 d) Controlled access protocol: In controlled access, the stations consult one

another to find which station has the right to send. A station cannot send unless it has been authorized by other stations. The three popular controlled access method are reservation, polling and token passing.

i) Reservation: In this method, a station needs to make a reservation before sending data.

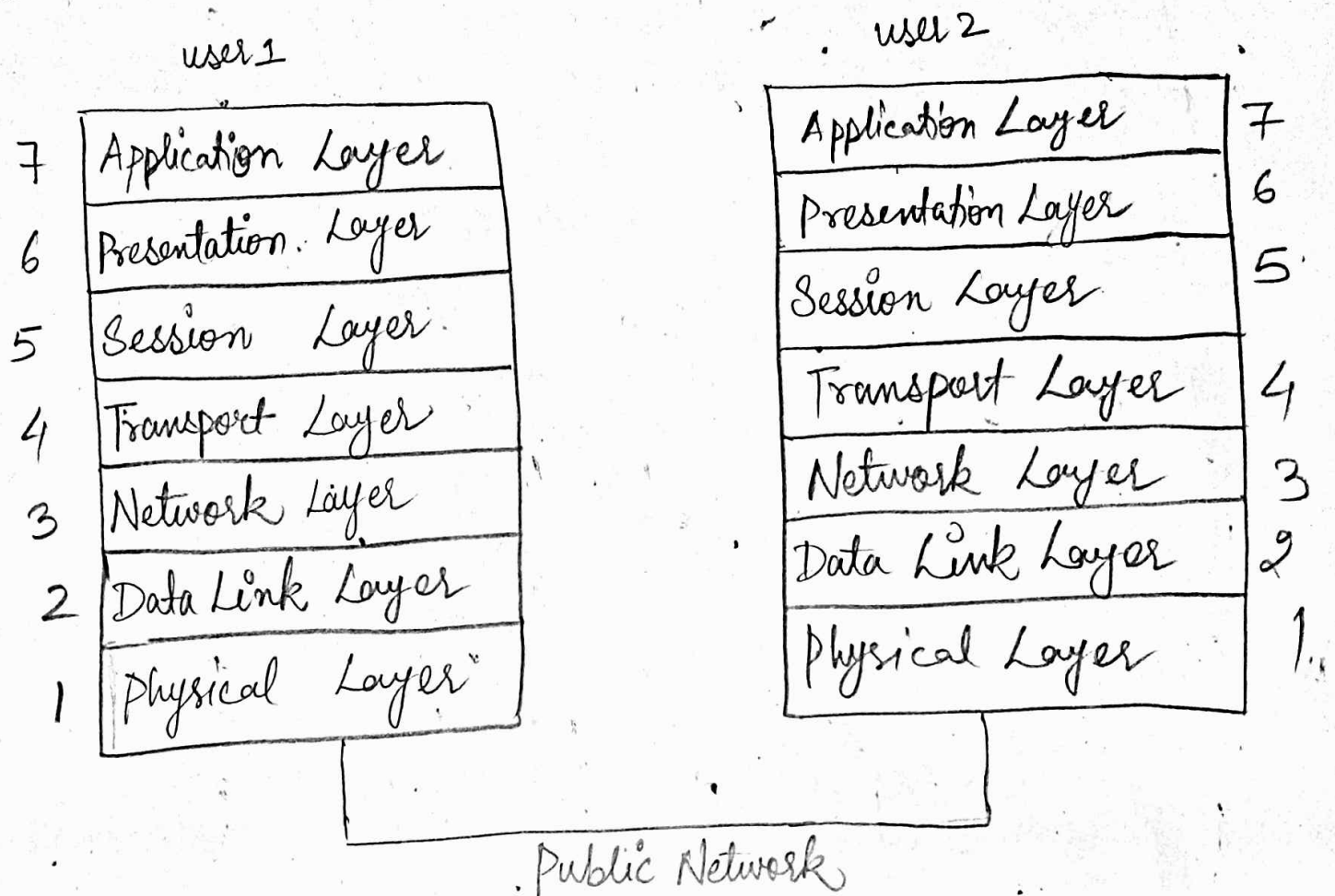
ii) Polling: It is similar to the roll-call performed in class. In this, one act as primary station and other are secondary stations.

Name: Bazgha Page No: 3 Date: 14/12/21 Signature: Bazgha Razi

All data exchanges must be through the controller.

(ii) Token passing: In token passing, the stations are connected logically to each other in form of ring and access of stations is governed by tokens. A token is special bit pattern or a small message, which circulates from one station to the next in some predefined order.

Ans 2 a) ISO-OSI reference model



- i) Physical Layer : It helps to activate or deactivate the physical connection using ~~router~~ hub. Hub, repeater used so that data is not lost.
- ii) Data Link Layer : Switch, bridge these two devices are used in data link layer.
- Nowadays switches are used more and bridges are outdated.

function of the data link layer are synchronization and error detection bits to the data which are to be transmitted. It uses frame format. It takes ~~the~~ physical address ~~that~~ i.e., mac address from that device.

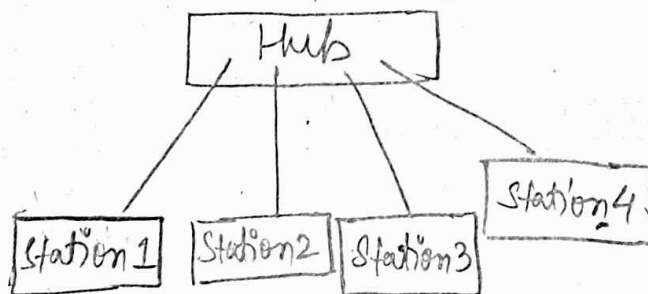
- iii) Network Layer: It is used to route the signals through various channels to the other end. Router is used in network layer. It uses logical address i.e., IP address. It provides IP address to your data. It uses packet.
- iv) Transport Layer: It decides if the data transmission should take place on parallel paths or single paths. This layer helps in data transfer. Segment and datagram is used in this layer.
- v) Session Layer: Decide session to deliver or receive data in particular time.
- vi) Presentation Layer: It makes sure that information is delivered in such a form that the receiving system will understand and use it. It receives encrypted data than using cipher text it decrypts the data and use it.

vii) Application Layer: It is the top layer or seventh layer of the ISO-OSI reference model. It provides different services such as manipulation of information in various ways to the user who is sitting above this layer. Logic action is also provided by application layer.

viii) Public Network / Layer: Coaxial cable, twisted pair, fibre optic cable is used in public layer. It connects two users using wires or cables.

Ans 3a) Network Topology: It defines the structure of the network of how all the components are interconnected to each other. There are various topology such as mesh, star, ring and bus topology.

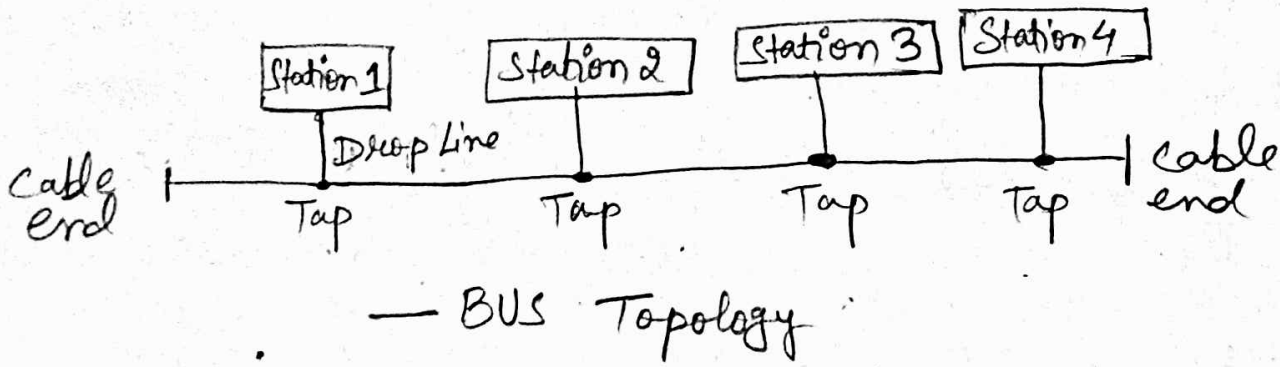
i) Star Topology: All the nodes go to the central location having a device called hub. All the devices on the network ~~are~~ connected with hub through a link. Each device require single wire for the connection to the hub. In this topology, there exist a point-to-point connection between a node and hub. Hub manages entire function of the network. It is very flexible and high reliability. In this fault identification is easy. Also easy to remove nodes.



Star
Topology

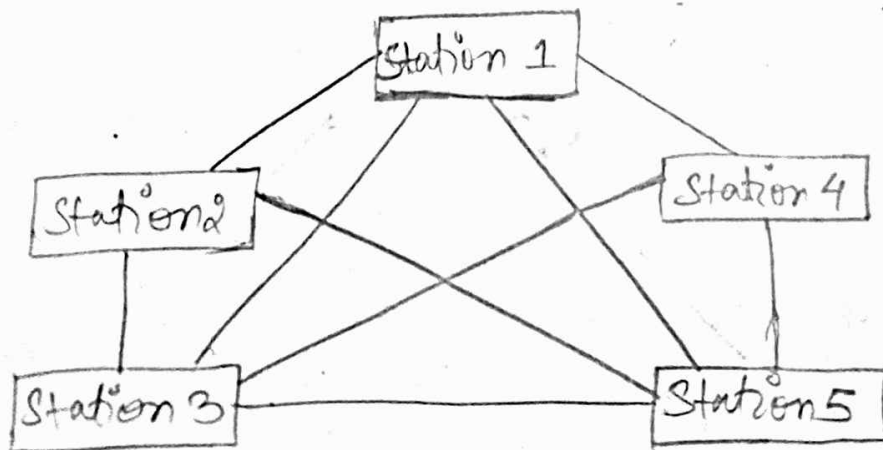
ii) Bus topology: It consist of a single cable with the termination at each end.

All available devices are connected to the single cable. One single cable work as backbone for the whole network. Cable cost is less in this topology. easily expandable by joining two cable.



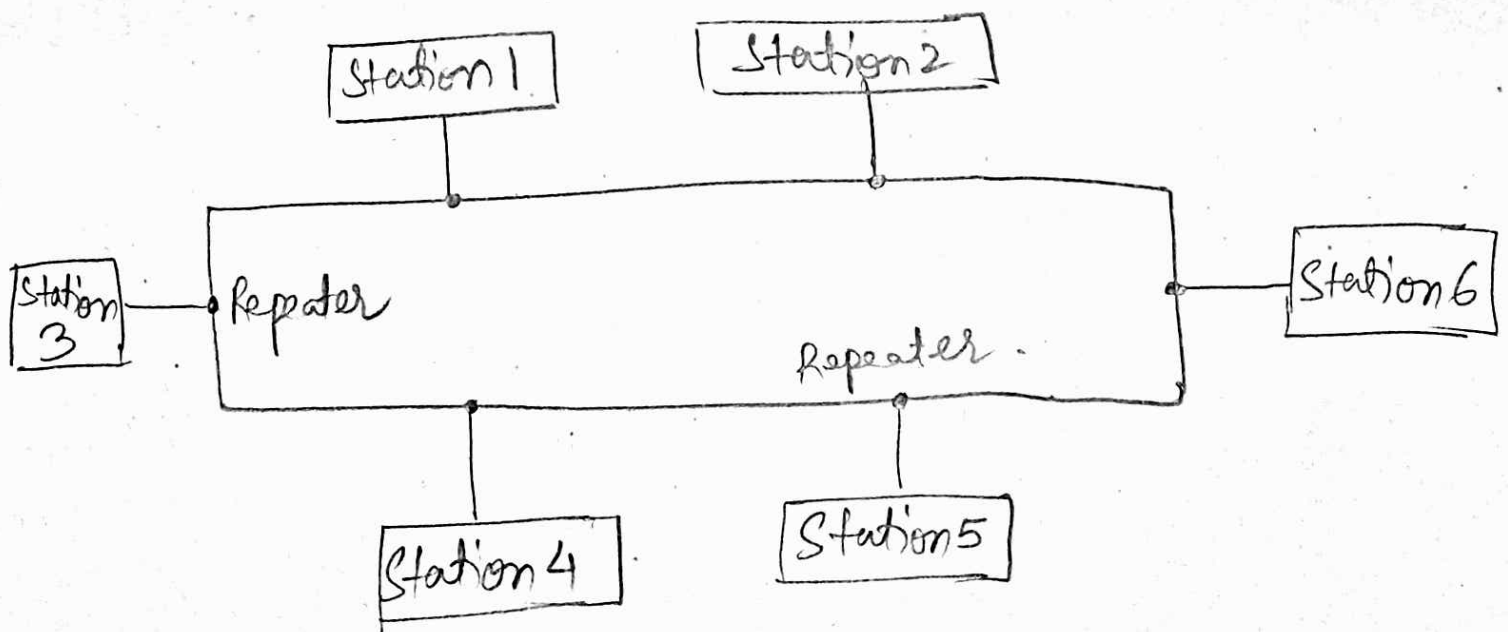
iii) Mesh Topology: All the computers are connected to each other in network. It

is very difficult to establish the connections of the mesh topology. In this, every computer has a point-to-point connection to the other computer. Communication link can be twisted pair, optical fibre or coaxial cable. It requires $\frac{n(n-1)}{2}$ communication links, to connect n nodes.



Mesh
Topology

iv) Ring Topology : In this, each computer node is connected with its neighbouring computers forming the shape of ring hence this is known as ring topology. In this, the data travels in a circular fashion from one computer to another. In case of any failure in a cable or device break, the circular loop can take down the entire network. Chance of packet collision reduces. Maintenance is much easier than the bus topology. Cable faults can be located easily in ring topology, therefore troubleshooting is easier.



— Ring Topology