PRACTICE SET

Questions

Q17-1. A *forwarding port* forwards a frame that it receives; a *blocking port* does not.

Q17-2. A *VLAN* saves time and money because reconfiguration is done through software. Physical reconfiguration is not necessary.

Q17-3. Members of a *VLAN* can send broadcast messages with the assurance that users in other groups will not receive these messages.

Q17-4. A *VLAN* creates virtual workgroups. Each workgroup member can send broadcast messages to others in the workgroup. This eliminates the need for multicasting and all the overhead messages associated with it.

Q17-5. A *router* has more overhead than a switch.

  a. A router process the packet at three layers; a switch processes a frame at only two layers.

  b. A router needs to search a routing table for finding the output port based on the best route to the final destination; A switch needs only to consult a filtering table based on the location of stations in a local network.

  c. A routing table is normally longer than a filtering table; searching a routing table needs more time than searching a filtering table.

    d. A router changes the link-layer addresses; a switch does not.

Q17-6. *A link-layer switch* have access to station *link-layer addresses* and can forward a packet to the appropriate segment of the network. In this way, they *filter* traffic and help reducing traffic. See also Question Q17-2.

Q17-7. An *amplifier* amplifies the signal, as well as noise that may come with the signal, whereas a *repeater* regenerates the signal, bit for bit, at the original strength.

Q17-8. A *switch* have access to station addresses and can forward a packet to the appropriate segment of the network. In this way, they filter traffic and help reducing traffic.

Q17-9. A *transparent switch* is a switch in which the stations are completely unaware of the switch's existence. If a switch is added or deleted from the system, reconfiguration of the stations is unnecessary.

Q17-10. A *hub* is a *multiport repeater*.

Q17-11. Stations can be grouped by *port number*, *MAC address*, *IP address*, or by a combination of these characteristics.

Q17-12. A *switch* has more overhead than a repeater.

    a. A switch processes the frame at two layers; a repeater processes a frame at only one layer.

    b. A switch needs to search a table and find the forwarding port as well as to regenerate the signal; a repeater only regenerates the signal. In other words, a switch is also a repeater (and more); a repeater is not a switch.
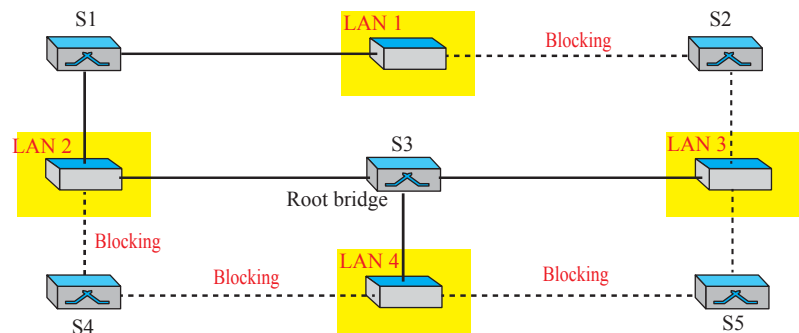
Problems

P17-1.

    a. A filtering table is based on the link-layer destination address of the arrived frame.

    b. A routing table is based on the network-layer destination address of the arrived packet (datagram).

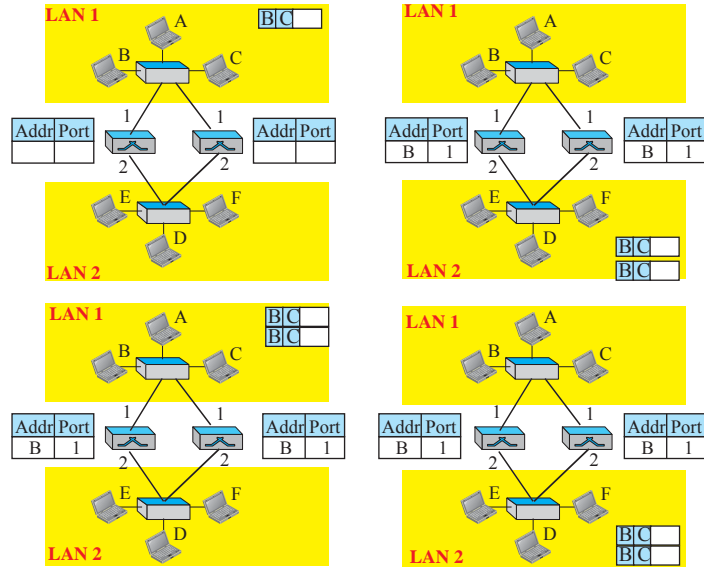**P17-2.** The following figure shows one solution.
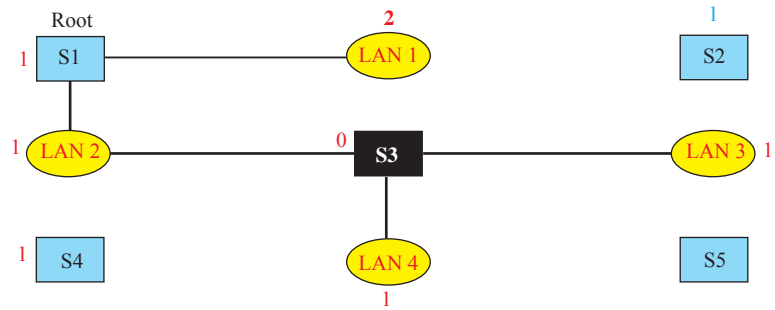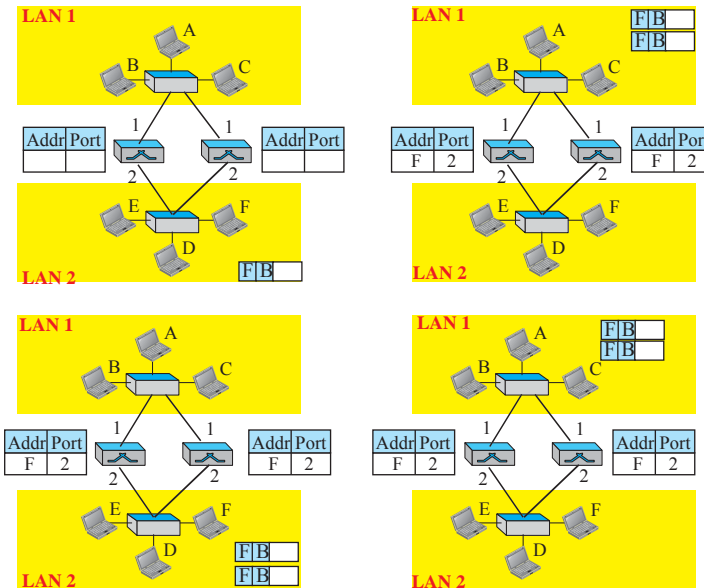

a. Spanning Tree

b. Logical connection with blocking port

P17-3. See the following figure.
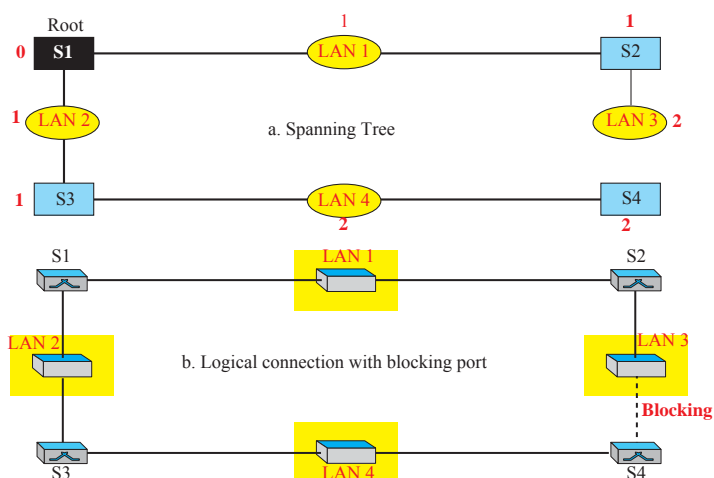

P17-4. See the following figure.

P17-5. The router in this case acts as a link-layer switch and needs a link-layer address.

P17-6. The answer is yes. Each port needs a link-layer address; otherwise, no frame si sent out from that port.

P17-7. The looping problem comes from redundancy (two switches between the LANs instead of just one). If we change the hub in both LANs, it reduces the traffic in each LAN, but the switches between the two LANs still forward the frame in both direction.

P17-8. The following figure shows one solution.

P17-9. The following figure shows one solution.
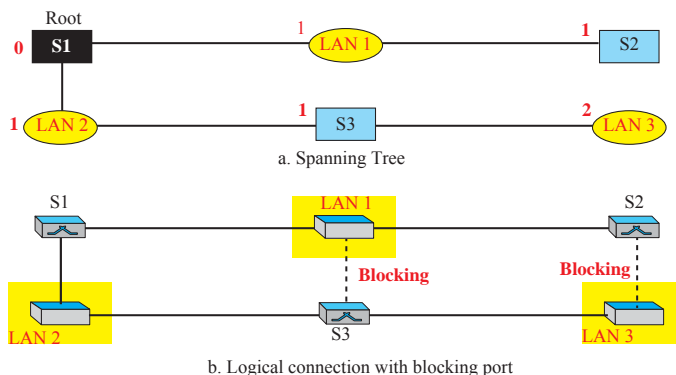
P17-10. The looping problem comes from redundancy (two switches between the LANs instead of just one). If we change the hub in LAN1, it reduces the traffic in this LAN, but the switches between the two LANs still forward the frame in both direction.