| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

1. Which routing algorithm suffers from count to infinity problem.
   A. Distance vector
   B. Link state
   C. DHCP
   D. None
2. _____ dedicates network resources, whereas _____ share network resources.
   A. Circuit switching, packet switching
   B. Packet switching, circuit switching
   C. Frame Relay, ATM
   D. ATM, Frame Relay
   E. None
3. In _____ transmission signals are transmitted in both directions simultaneously.
   A. half duplex
   B. multipoint
   C. full duplex
   D. simplex
   E. None
4. Ping sends:
   A. TCP messages
   B. ICMP messages
   C. OSPF messages
   D. RIP messages
   E. None
5. Network operators can manage a network through
   A. SNMP
   B. NETCONF
   C. CLI
   D. A+B+C
   E. None

6. When a router input or output queue is full, the packet to be dropped is:
   A. The new incoming packet.
   B. The first packet in queue
   C. The last packet in queue
   D. Based on the queue management algorithm
   E. None
7. The IP address of the datagram is 11001000.11001000.11001000.11001000. Which of the following router link interface prefixes would best match the IP address of the datagram?
   A. 11001000.11001000.1100100
   B. 11001000.11001000.110010
   C. 11001000.11001000.11001
   D. They all are the same
   E. None
8. One purpose of Network Address Translation (NAT) is to conceal private network information the rest of the Internet. A NAT device achieves this purpose by:
   A. Changing the source IP address in all outgoing packets
   B. Changing the destination IP address in all outgoing packets
   C. Changing the source IP address and port in all outgoing packets
   D. Changing the destination IP address and port in all outgoing packets
   E. None
9. OSPF is a _____ routing protocol, while RIP is a _____ routing protocol.
   A. DV, LS
   B. LS, DV
   C. Hybrid, LS
   D. LS, hybrid
   E. None
10. The BGP protocol is an example of:
   A. Inter- AS routing protocol used between Autonomous Systems
   B. Intra- AS routing protocol used between Autonomous Systems
   C. Inter- AS routing protocol used within Autonomous Systems
   D. Intra- AS routing protocol used within Autonomous Systems
   E. None

point each).

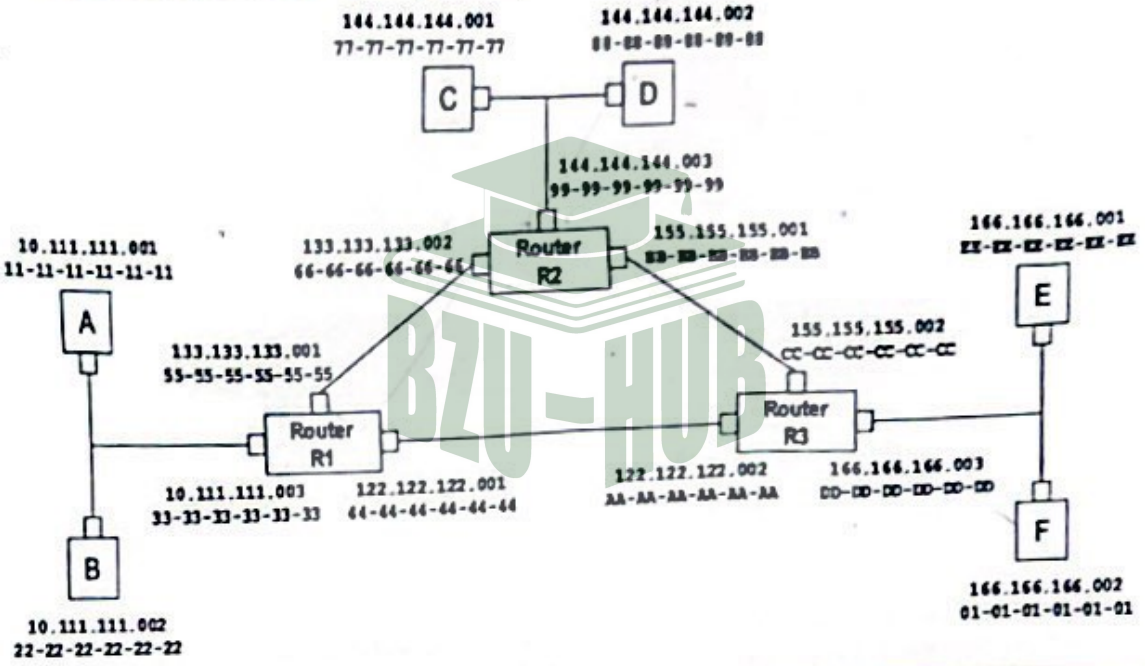
the following questions with True or False, and then fill the table with your final answers.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| **11** | **12** | **13** | **14** | **15** | | | | | |
| | | | | | | | | | |

1. In datacenter networks, there are redundant paths ( ).
2. With Aloha, when a node has a packet to send, before sending it must listen to the media to ch someone else is sending. ( ).
3. CSMA/CD has always better performance than Aloha and slotted Aloha ( ).
4. NAT is a possible solution for IP address shortage problem ( ).
5. DHCP client send "DHCP discover" message to a specific DHCP server ( ).
6. A flow table entry with no action indicates that a matched packet should be dropped ( ).
7. LS approach nodes exchange topology information only with their neighbors ( ).
8. In Client/Server network, each computer can act as a client and server ( ).
9. The ingress port refers to the input port at the packet switch on which a packet is received
10. Centralized routing algorithm computes the least-cost path between a source and desti complete, global knowledge about the network ( ).
11. In routing algorithms, it is recommended to rely on the instantaneous level of congestic the path ( ).
12. In CSMA/CD, after 3 collisions, a node selects a random number between 0 and 3 be to retransmit ( ).
13. Packet forwarding by SDN-controlled switches can be based on any number of head only the transport-layer or the network-layer ( )
14. CRC can detect and correct errors. ( )
15. It is possible to have more than 2 VLANs on the same switch ( )

**Question#7: (15 points)**

a. **(8 points)** Consider the following network where host D wants to send a TCP segment to host F. The TCP segment sent by host D will pass through **R2, then R1, then R3** before reaching host F. Assume that all ARP tables are complete except for router R1 (i.e., router R1 ARP table is empty). Complete the following table related to the TCP segment sent from D to F (the first row is already filled). Note that the possible frame types are **ARP Query, ARP Response,** and **data**. Note also that the source and destination IP addresses refer to the IP addresses contained in the payload of each frame. **(Hint:** There are a total of 6 frames that will be generated).




| Frame | Frame Type | Source MAC | Destination MAC | Source IP | Destination IP |
|---|---|---|---|---|---|
| 1 | data | 88-88-88-88-88-88 | 99-99-99-99-99-99 | 144.144.144.002 | 166.166.166.002 |
| 2 | data | | | | |
| 3 | ARP Query | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |