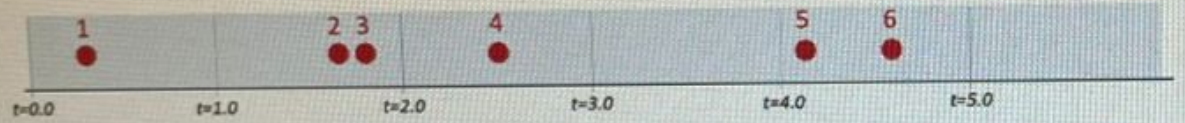
Question 10

1 pts

Consider the figure below, which shows the arrival of 6 messages for transmission at different multiple access wireless nodes at times t = 0.3, 1.7, 1.8, 2.5, 4.2, 4.6. Each transmission requires exactly one time unit.



For the **pure ALOHA** protocol, indicate which packets are successfully transmitted. You can assume that if a packet experiences *a collision*, a node will not attempt a retransmission of that packet until sometime after $t=5$.

- (●) 1
- ( ) 2
- ( ) 3
- ( ) 4
- ( ) 5
- ( ) 6

Question 9

1 pts

Suppose you walk into a room, connect to Ethernet, and want to download a Web page. Which of the following protocols take place, starting from powering on your PC to getting the Web page? Assume there is nothing in the DNS and browser caches when you power on your PC.

- ○ Ethernet, DHCP, ARP, DNS, TCP, OSPF, BGP, and HTTP protocols
- ◉ Ethernet, DHCP, ARP, DNS, UDP, and HTTP protocols
- ○ Ethernet, DHCP, ARP, DNS, TCP, OSPF, and BGP protocols
- ○ Ethernet, MPLS, VLAN, DHCP, ARP, DNS, TCP, OSPF, BGP, and HTTP protocols

Question 8

1 pts

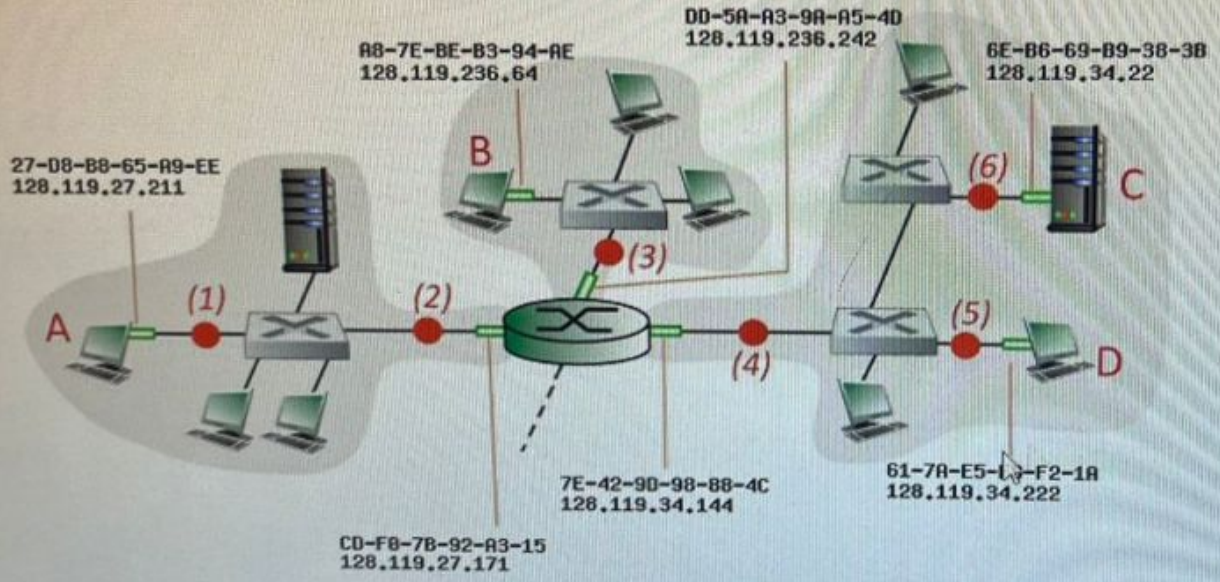
Suppose nodes A and B transmit over a 10 Mbps broadcast channel with a propagation delay between the nodes equals to 325s. Suppose CSMA/CD and Ethernet packets are used for this broadcast channel. If node A begins transmitting a frame and, before it finishes at time t = 576s (minimum timed frame 512+64), node B begins transmitting a frame. Can node A finish transmitting before it detects that node B has transmitted?*Hint: In the worst case, node B begins transmitting at time t = 324, which is the time right before the first bit of A's frame arrives at B.*

- (●) Yes, with a collision since it finishes transmitting before it detect that B has transmitted
- ( ) Yes, without a collision since it finishes transmitting before B has transmitted

Question 7

1 pts

Consider the following network with IP and MAC addresses as indicated for nodes A, B, C and D, as well as for the router's interfaces. Assume an IP datagram is being sent from node C to node D. What is the source and destination Ethernet addresses, as well as the source and destination addresses of the IP datagram encapsulated within the Ethernet frame at points (6) indicated in the network.



- [x] Ethernet source, destination address: 6E-B6-69-B9-38-3B, 61-7A-E5-F8-F2-1A
- [x] IP source, destination address: 128.119.34.22, 128.119.34.222
- [ ] IP source, destination address: 128.119.34.22, 128.119.34.144

Question 6

1 pts

Network administrators like to group users on LANs to reflect the organizational structure rather than the physical layout of the building for a variety of reasons. One issue is security. For example, one LAN might host Web servers and other computers intended for public use. Another LAN might host computers containing the records of the Human Resources department that are not to be passed outside of the department. In such a situation, putting all the computers on a single LAN and not letting any of the servers be accessed from off the LAN makes sense. A second issue is load. Some LANs are more heavily used than others, and it may be desirable to separate them. A third issue is broadcast traffic. Therefore, more flexibility is required in the design of LANs. What solution is widely used in networking to address this flexibility, and which vendors provide an important feature on switches? Write your answer in capital letters.

VLAN

Question 5

1 pts

When the IPv6 protocol is introduced, the implementation of the ARP protocol will not be necessary anymore because there will be a surplus of IP addresses.

- (●) True
- ( ) False

Question 4

1 pt

Which of the following characteristics does Token Ring have in a broadcast channel?

- [x] When only one node has data to send, that node has a throughput of R bps.
- [ ] When M nodes have data to send, each of these nodes has a throughput of R/M bps. This need not necessarily imply that each of the M nodes always has an instantaneous rate of R/M, but rather that each node should have an average transmission rate of R/M over some suitably defined interval of time.
- [ ] The protocol is centralized; that is, there is a master node that represents a single point of failure for the network.
- [x] The protocol is decentralized; that is, there is no master node that represents a single point of failure for the network.

Question 3

1 pts

With the CSMA/CD protocol, the adapter waits K·512 bit times after a collision, where K is drawn randomly. For K=100 and a 100 Mbps broadcast channel that connects nodes with a distance of 50 Km and a propagation speed $3x10^8$ m/sec. Assume a frame is 1 MTU = 1500B. What is the channel efficiency?

- ○ 12%
- ○ 37%
- ● 18%
- ○ 100%

Question 2

1 pts

In practice, a strong error-detecting code that is in widespread use at the link layer is the CRC (Cyclic Redundancy Check), also known as a polynomial code. Consider the 4-bit generator, G=1101, and suppose that D has the value 100100. What is the value of R?

- ○ 100
- ◉ 010
- ○ 001
- ○ 0101

Question 1

1 pts

Suppose the information content of a packet is the bit pattern 11100110 , and an even parity scheme is being used. What would the value of the field containing the parity bit be in the case of a single-bit parity scheme?

- 1
- 0