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| --- | --- | --- | --- | --- | --- | --- |
| **Q.1** |  | **Do as directed.** | | | | **[12]** |
| CO4 | N | (a) | | Which of the following(s) can not be a source IP address?  (i) 238.238.238.238 (ii) 127.0.0.1 (iii) 172.172.172.172 (iv) 227.227.227.227 (v)12.12.255.255 | | **[2]** |
| CO1 | U | (b) | | Checksum of TCP is calculated by incorporating followings.  (i) IP header (ii) TCP header (iii) Data  (iv) Pseudo header (v) Frame header (vi) All of these | | **[2]** |
| CO3 | N | (c) | | When is size of ssthresh reduced to one half of the value of cwnd by TCP sender? | | **[2]** |
| CO3 | N | (d) | | In CSMA/CD with binary exponential back-off, after the fifth collision, what is the probability that a node chooses to wait for 4 slot times? Show your calculation. | | **[2]** |
| CO1 | A | (e) | | An Ethernet frame carries 12 bytes of data. What is the length of the frame? Show your calculation. | | **[2]** |
| CO3 | U | (f) | | In the binary countdown method, explain (with suitable example) how a lower-numbered station may be starved from sending a frame. | | **[2]** |
|  |  |  | |  | |  |
| **Q.2** |  | Attempt ***Any TWO*** from the following questions. | | | | **[12]** |
| CO2 | A | (a) | | (1) Consider a TCP connection between a client and a server; the round trip time is 4 ms, the size of the receiver advertised window is 40 KB, slow-start threshold at the client is 16 KB, and the maximum segment size is 1 KB. The connection is established at time t=0. Assume that there are no timeouts and errors during transmission. What is the size of the congestion window (in KB) at time 32 ms after all acknowledgements are processed?  (2) Explain split TCP with its limitations. | | **[6]** |
| CO2 | N | (b) | | (1) Which ICMP error messages are generated by the destination?  (2) Which of the following(s) is/are correct for ARP?  (i)The ARP protocol is used to get destination MAC address from the destination IP address.  (ii)The ARP protocol is used to get the destination IP address from the destination MAC address.  (iii) ARP request is broadcasted.  (iv) The ARP protocol works on the same network as well as connected networks.  (3) Retransmission of packets must be done when \_\_\_\_\_\_\_  (i) Packet is lost (ii) Packet is corrupted (iii) Packet is rerouted (iv) Packet is error-free (v) RTT is over (vi) None of these | | **[6]** |
| CO2 | E | (c) | | What is the significance of followings in TCP?  (i)Time waited timer (ii) Jacobson’s algorithm (iv) CLOSE WAIT | | **[6]** |
|  |  |  | |  | |  |
| **Q.3** |  | **Answer the following questions.** | | | | **[12]** |
| CO4 | N | (a) | Assume that there are only two stations, A and B, in a bus CSMA/CD network. The distance between the two stations is 2000 m and the propagation speed is 2 x 108 m/s. If station A starts transmitting at time t1:   1. Does the protocol allow station B to start transmitting at time t1 + 8 μs? Why? If the answer is yes, will collision take place? Explain. 2. Does the protocol allow station B to start transmitting at time t1 +11 μs? Why? If the answer is yes, will collision take place? Explain. | | **[3]** | |
| CO4 | U | (b) | Describe Iterative and Recursive resolution methods of DNS. | | **[3]** | |
| CO1 | C | (c) | Sixteen stations, numbered 1 through 16, are contending for the use of a shared channel by using the adaptive tree walk protocol. If stations 3, 4, 6, 7, 8, 15 and 16 suddenly become ready at once, how many bit slots are needed to resolve the contention? Draw the binary tree defining the tree walk. How many slots are needed to resolve the contention if improved algorithm suggested by Bertsekas and Gallager is used? Show your calculations. | | **[6]** | |
|  |  |  | **OR** | |  | |
| **Q.3** |  |  | **Answer the following questions.** | | **[12]** | |
| CO4 | N | (a) | In a CSMA/CD network with a data rate of 10 Mbps, the maximum distance between any station pair is found to be 2000 m for the correct operation of the collision detection process. What should be the maximum distance if we increase the data rate to 100 Mbps? To 1000 Mbps? | | **[3]** | |
| CO4 | U | (b) | Discuss simple and structured data types defined by SMI (Structure of Management Information). | | **[3]** | |
| CO1 | C | (c) | Consider three LANs are interconnected using two bridges as shown in figure below. As shown hosts a, b, c and f are on LAN 1. d and e are on LAN 2 and g is on LAN 3. Current hash table of each bridge is shown in figure.   1. Show how the hash tables of different bridges change after each of the following events happen in sequence. 2. In which of the following events (2 to 4) does a message reach to the destination? Explain.   **1.** f moves to LAN 3 **2.** c sends to g **3.** a sends to f **4.**f sends to a | | **[6]** | |