

1. An Ethernet MAC sublayer receives 30 bytes of data from the upper layer. How many bytes of padding must be added to the data?
2. Name the strategy of doubling the delay interval between each retransmission attempt?
3. Describe CSMA Protocol in simple terms?
4. Given the frame transmission time  $T_{Fr}$  to be 100ms. What is the vulnerable time in which collision may occur in Pure ALOHA compared to slotted ALOHA?
5. A network with CSMA/CD protocol in the MAC layer is running at 5Gbps over a 5km cable with no repeaters. The signal speed in the cable is  $3 \times 10^8$  m/sec. What would be the minimum frame size for this network?
6. Determine the maximum length of the cable in km, for transmitting data at a rate of 300 Mbps in an Ethernet LAN with frames of size 5,000 bits. Assume the signal speed in the cable to be  $2 \times 10^8$  km/s?
7. What is the destination MAC address used by Bridge Protocol Data Units(BPDUs)?
8. Describe the operation of the spanning tree protocol in computer networks?
9. Describe the latency components?
10. What is the propagation time if the distance between node A and B is 1700km. Assume the propagation speed to be  $2.4 \times 10^8$  m/s in the media cable used?
11. Station A needs to send a message consisting of 9 packets to station B using sliding window (window size 3) and go-back-n ARQ error control strategy. All packets are ready and immediately available for transmission. If every 5<sup>th</sup> packet that A transmits gets lost (but no ACKs from B ever get lost), then what is the number of packets that A will transmit for sending the message to B?
12. In flow control, station A uses 64 byte packets to transmit message to station B using a sliding window protocol. The round trip delay between A and B is 70 milliseconds and bottleneck bandwidth on the path

- between A and B is 100kbps. Determine the Bandwidth Delay product (BDP) and determine the optimal window size that A should use?
13. What is the hexadecimal equivalent of the following Ethernet address?  
01111110 01110001 01010101 011111000 10101010 11101111
14. What are the functions for RTS-CTS and where are they applied?
15. Describe VLAN and its purpose
16. Identify the IEEE standards for Bluetooth, WiFi and Ethernet
17. Define Bluesnarfing?
18. Describe piconet and scatternet?
19. Define Access point in WLAN?
20. Identify which multiple access technique is used for WiFi standard?
21. Define a runt frame?
22. What is the minimum and maximum size of the payload in ethernet frame?
23. What is the Start Frame Delimiter (SFD) in ethernet frame?
24. Describe all the error detection techniques and learn how to compute the errors for CRC and LRC and their performances.
25. Consider the data unit 10111101111000111010010010011101 to be transmitted by the sender. Determine the following
- a) number of blocks after segmenting the message?
  - b) number of bits per block?
  - c) The checksum?
26. The message 11001111 at the sender side is to be transmitted using CRC polynomial  $x^3+x^2+1$  to protect it from errors. Determine the following?
- a) the bits of the divisor L?
  - b) the length of the CRC bits to be appended to the message?
  - c) The CRC bits
  - d) Message to be transmitted?