CISC 7332X Spring 2022 Final Exam

You may use calculators on this exam. Pick the best answer that fits the question. 5-points per question. Not all of the answers may be correct. If none of the answers fit, write your own answer.

1. An sd card is 0.001kg. An airplane carrying 100,000kg of 1TB sd cards is flying 2000km distance at 1000km/h (assuming no stops), what's the capacity per second? (tip: what X terabits/second?)

   (a) Answer is: _____

2. For Ethernet 10 (10Mbps), the CSMA/CD happens during first N of each frame. What is N in microseconds?

   (a) Answer is: _____

3. The purpose of a network mask is:

   a. To add to the host address and get network address.
   b. To find the network address.
   c. To extract the host MAC address from the Ethernet frame.
   d. To cover up ugly IP addresses.
   e. None of the above, answer is: _____

4. The MAC layer is responsible for:

   a. End to end error correction.
   b. Routing.
   c. Dealing with collissions.
   d. Converting ASCII to EBCDIC.
   e. None of the above, answer is: _____

5. On a bus network,

   a. devices connect using a passive interface.
   b. devices connect using an active interface.
   c. LLC layer handles CSMA/CD
   d. all of the above
   e. None of the above, answer is: _____

6. Ring network,

   a. devices connect using a passive interface.
   b. devices connect using an active interface.
   c. LLC layer handles CSMA/CD
   d. all of the above
   e. None of the above, answer is: _____

7. Slotted ALOHA improved:

    a. Principle Time.
    b. Propagation Time.
    c. Flight Time.
    d. Vulnerable Time.
    e. None of the above, answer is: _____

8. If bandwidth is 16MHz, and SNR is 7, max error free capacity of the channel is (in Mbps):

    (a) Answer is: _____

9. If bandwidth is between 48MHz and 64MHz, and SNR is 15, about how many voltage levels are required to achieve maximum capacity

    (a) Answer is: _____

10. We are transmitting data at a rate of 16Mbps. During transmission, the noise introduces errors so that, on average, 4% of bits are received incorrectly (i.e.: a 0 as 1, or 1 as 0). The maximum error free capacity of this channel is (in Mbps):

    (a) Answer is: _____

11. Continuing previous question, if we used 6 voltage levels, what's the bandwidth (in MHz) required for this channel?

    (a) Answer is: _____

12. Continuing previous question, what's the signal-to-noise ratio?

    (a) Answer is: _____

13. Noise has 20mW of power, signal power 4W. What's the bandwidth required to achieve 100Mbps capacity?

    e. Answer is: _____

14. We are transmitting data at 6W, and detect 1.7W when recieving, attenuation in decibels is:

    (a) Answer is: _____

15. If SNR is 10, what's the SNR_{dB}?

    e. Answer is: _____

16. If bandwidth is 50MHz, and SNR_{dB} is 21, what's the error free capacity of the channel?

    e. Answer is: _____

17. Which protocol is used to find the MAC address:

    a. DNS
    b. SMTP
    c. TCP

d. ARP

e. None of the above, answer is: _____

18. In Sliding Window ARQ, selective reject NAK:

a. Retransmits all frames following the NAK.

b. Acknowledges everything prior to NAK.

c. Rejects all messages prior to NAK.

d. Selectively rejects all messages following NAK.

e. None of the above, answer is: _____

19. Length of a full-duplex Gigabit Ethernet network is limited by:

a. data rate

b. CSMA/CD

c. packet size

d. all of the above

e. None of the above, answer is: _____

20. What was the primary motivation to move from Manchester line coding to something like 4B5B?

a. Manchester has a DC component.

b. Manchester has no synchronization.

c. Manchester only synchronizes every 12 bits.

d. Manchester requires twice the bandwidth of 4B5B.

e. None of the above, answer is: _____