

CISC 7332X Spring 2021 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.

Answers must be emailed in plain text (no formatting, no attachments). Email *must* have your *full name* and “CISC 7332X” at the *top*. Answers to questions must be clearly marked (question number before each answer), and be in sequence (question 1 should come before question 2, etc.).

Email must arrive by 8:00AM on 2021-05-26.

1. A hard-drive is 0.5kg. A truck carrying 5,000kg of 18TB hard-drives is driving 2000km distance at 100km/h (assuming no stops), what's the capacity per second? (tip: what X terabits/second?)

(a) Answer is: _____
2. For Fast Ethernet (100Mbps), 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 extract the host MAC address from the Ethernet frame.
 - b. To add to the host address and get network address.
 - c. To find the network address.
 - 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. Converting ASCII to EBCDIC.
 - d. Dealing with collisions.
 - e. None of the above, answer is: _____
5. On a bus network,
 - a. devices connect using an active interface.
 - b. devices connect using a passive 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 an active interface.
 - b. devices connect using a passive 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. Vulnerable Time.

d. Flight Time.

e. None of the above, answer is: _____

8. If bandwidth is 6Mhz, and SNR is 15, max capacity of the channel is (in Mbps):

(a) Answer is: _____

9. If bandwidth is between 48MHz and 54MHz, and SNR is 31, about how many voltage levels are required to achieve maximum capacity

(a) Answer is: _____

10. We are transmitting data at a rate of 6Mbps. During transmission, the noise introduces errors so that, on average, 3% 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 4 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 10mW of power. We boost signal power to 4W. What's the bandwidth required to achieve 300Mbps capacity?

e. Answer is: _____

14. We are transmitting data at 4W, and detect 3.9W when receiving, attenuation in decibels is:

(a) Answer is: _____

15. If SNR is 100, what's the SNR_{dB} ?

e. Answer is: _____

16. If bandwidth is 20Mhz, 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. ARP
- d. TCP
- e. None of the above, answer is: _____

18. In Sliding Window ARQ, selective reject NAK:

- a. Retransmits all frames following the NAK.
- b. Rejects all messages prior to NAK.
- c. Selectively rejects all messages following NAK.
- d. Acknowledges everything prior to NAK.
- e. None of the above, answer is: _____

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

- a. data rate
- b. packet size
- c. CSMA/CD
- 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 requires twice the bandwidth of 4B5B.
- d. Manchester only synchronizes every 12 bits.
- e. None of the above, answer is: _____