CS670 Fall 2002 Midterm A Name _____

For True/False and Multiple choice questions, circle the best answer.

1. (2 pts) T/F One of the disadvantages of a connection-oriented service is that the sender does not know beforehand if the receiver is able to accept data.
2. (12 pts) Draw the ISO/OSI reference model (Level 1 at the bottom). Give a one-sentence description of what each layer does.

3. (10 pts) Draw the TCP/IP "hourglass" diagram. Indicate what "TCP" and "IP" stand for.

4. (6 pts) Write the equations for (a) Propagation Delay and (b) Transmission Delay.

5. (4 pts) What is the speed of light in:
    a. fiber optic cable? _____
    b. copper cable? _____
6. (3 pts) One way to interpret the Delay Bandwidth product of a link is that it is the number of bits that the sender must send before _____.
7. (2 pts) You might choose to use Manchester encoding on a link because:
    a. It provides a bit rate that is higher than its Baud rate.
    b. It helps ensure synchronization between sender and receiver.
    c. Both a and b
    d. Neither a nor b.
8. (2 pts) The basic sampling interval for telephone signals is 125 microseconds because:
    a. Shannon's theorem says any longer interval introduces too much noise.
    b. According to Shannon's theorem, a system with 2 signalling levels must be sampled at 125 microseconds
    c. The Nyquist rate for a system with an 8MHz bandwidth is 125 microseconds.
    d. None of these is correct.
9. (2 pts) How many telephone voice circuits can be carried by a T1 line? _____
10. (2 pts) The acronym "SONET" stands for _____.
11. (4 pts) Name two methods for detecting the length of the data field in a frame.

12. (2 pts) Which method allows the correction of more bit errors in a frame?
    a. Simple parity.
    b. 2D parity
    c. Checksum
    d. CRC
13. (2 pts) One major difference between the Sliding Window Algorithm (SWA) and the Go Back N (GBN) protocols is:
    a. The SWA uses time outs
    b. GBN uses ACKs
    c. Both a and b are true
    d. Neither a nor b is true
14. (7 pts) Draw the Ethernet (10Base…) frame format. Label and show the size of each field.

15. (4 pts) Two nodes on a 10BaseT Ethernet have collided twice in a row while attempting to send. List the possible delay times that the nodes will choose from for their third attempt.

16. (2 pts) Which of the following is a true statement about a "Learning" Bridge?
    a. It monitors source addresses of packets.
    b. It may flood the LANs it is connected to.
    c. Both a and b are true.
    d. Neither a nor b is true.

17. (2 pts) The Ethernet standard is the IEEE 802.___ standard.

18. (2 pts) A particular IP internetwork is made up of 5 individual networks. Each network has 6 computers in it. A particular router in this internetwork has 4 ports. Which of the following is true?
    a. A Link State Vector for this router would have exactly 4 entries.
    b. This router's routing table will have exactly 4 entries.
    c. Both a and b are true
    d. Neither a nor b are true

19. (2 pts) T/F Dijkstra's algorithm is a static routing algorithm that can be used to find the lowest-cost path between any two nodes in a network.

20. (2 pts) T/F "Leaky Buckets" are a suitable approach for open-loop routing.

21. (2 pts) Which kind of traffic is more compatible with the RED algorithm?
    a. Downloads of executable code or
    b. Streaming audio

22. (2 pts) T/F In an IP network, each computer must know the minimum MTU for any path it is going to send packets over.

23. (6 pts) An IPv4 packet carries 1000 bytes of data. No optional fields are used. What is the total length of the IP packet?

24. (6 pts) A computer's IP address is 192.41.6.20. Assuming standard "classful" addressing, what is the number of the network that the computer is connected to?

25. (2 pts) We discussed a technique that allows IPv6 packets to be transmitted over IPv4. This technique is called _____.

26. (6 pts) A computer's IP address is 160.22.130.7 and its Subnet Mask is 255.255.196.0. Give the computer's Network number, Subnetwork number, and host number.

27. (2 pts) The acronym "CIDR" stands for _____.