Name: **Matric No:**

EE3204/EE3204E CA-1 Quiz 1st Oct 2011, Time: 45 minutes
Lecturer: Assoc. Prof. Mohan Gurusamy

Instructions: Answer ALL questions. For each question, enter the most appropriate choice in the ANSWER TABLE in page 2. Each question carries 1 mark. It is a CLOSED book test. Normal Scientific Calculators are allowed. Programmable calculators are not allowed.

1. A message of size 2 MB is sent through a 100-km long link with the date rate of 100 Mbps and propagation delay of 5 μs per km. Assume that the message transfer is not acknowledged. What is the throughput rate achieved?

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(a) 0.997 (b) 0.168 (c) 0.840 (d) 9.9

2. Suppose that frames are transferred on a link using Go Back N ARQ with a window of size 7 and frames are numbered 0 through 7. The receiver sends RR 4 to the sender which is lost. The receiver then receives Frame 4 and Frame 5. It then receives a RR command frame with probe bit set to 1. The receiver responds to it by sending
(a) RR 4 (b) RR 6 (c) REJ 4 (d) REJ 5

3. Which of the following Ethernet devices is intelligent?
(a) Bus (b) Hub (c) Switch (d) Repeater

4. The letter "T" in 10 Base T Ethernet stands for "Tree" topology. (a) True (b) False

5. Which of the following statements is FALSE for a circuit switching network.
(a) no congestion (b) low bandwidth utilization (c) fixed TDM (d) no framing

6. Assume that host A is transferring a large number of frames to host B using stop-and-wait protocol through a 90 km-long 10 Mbps link with a propagation delay of 5 μs per km. Assume that each frame carries 125 bytes of data and the communication is error-free. What is the throughput achieved?

(a) 1 Mbps (b) 0.286 Mbps (c) 0.1 Mbps (d) 9 Mbps

7. An advantage of splitting a large block of data into small frames is
(a) The header overhead is small (b) The CRC field size is small
(c) The retransmission overhead is small (d) None of the above.

8. It is desirable to use a large window for sliding window based flow control on a high D×B link.
a) TRUE (b) FALSE

9. A packet is 10 μs wide on a link. How wide (in μs) is this packet when the link bandwidth is doubled?
(a) 5 (b) 10 (c) 20 (d) 40

10. It is desired to transmit a sequence of computer screen images over an optical fiber. The screen has 480×640 pixels, each pixel being 24 bits. There are 60 screen images per second. How much bandwidth (in Mbps) is required for this purpose?
(a) 442.368 (b) 0.122880 (c) 0.768 (d) 768.368

11. In Ethernet, "jam" signal carries the address of the host whose frame has just collided.
    (a) TRUE (b) FALSE

12. How many bits can be in transit on a 10-Mbps link which is 100 km long? The propagation speed is assumed to be 1km per 5μs.
    (a) 1 million (b) 10 million (c) 5000 (d) 50000

13. A bit string 011111001111110 needs to be transmitted at the data link layer. What is the string actually transmitted after bit stuffing?

    (a) 0111110011111010 (b) 0111110011111100 (c) 01111100011111100 (d) 01111100011111010

14. When data is encapsulated which is the correct order?
    (a) data, bit, frame, packet, segment (b) data, packet, frame, segment, bit
    (c) data, packet, segment, frame, bit (d) data, segment, packet, frame, bit

15. There is no TCP layer at the IP router in Internet layered architecture. (a) TRUE (b) FALSE

16. At most how many bits can be sent in one second if a 8 MHZ wide TV channel is used as a network link? Assume that the signal-to-noise ratio is 30 dB.
    (a) 0.8 Mbps (b) 16 Mbps (c) 8.0 Mbps (d) 80 Mbps

17. Consider a sliding window based flow control protocol that uses a 3-bit sequence number and a window of size 7. At a given instant of time, at the sender, the current window size is 2 and the window contains frame sequence numbers 3 and 4. Now the sender receives RR1 and updates the window. What does the new window contain?
    (a) {3,4,5} (b) {3,4,5,6} (c) {3,4,5,6,7} (d) {3,4,5,6,7,0}

18. What is the CRC computed for the bit sequence 110101 using the divisor polynomial x^2+1?
    (a) 00 (b) 01 (c) 10 (d) 11

19. Choose the incorrectly matched pair:
    (a) 802.3 Ethernet -- No flow control
    (b) PPP -- sentinel based framing
    (c) Ethernet Switch - Multiple collision domains
    (d) Ethernet Hub -- Multiple collision domains

20. Three hosts A, B and C attempt to transmit on an Ethernet. Each host has a steady queue of frames ready to send. At an instant of time, all the three hosts attempt to send their frames simultaneously and collision occurs. We say that the three hosts enter into a backoff race. Suppose that this collision is the first, second, and third collision experienced by host A, B, and C, respectively. What is the probability that host C wins the race? Host C is said to win if it transmits its current frame successfully before any other host and also before any other collision in the network.
    (a) 7/64 (b) 8/64 (c) 3/64 (d) 5/64

ANSWER TABLE:

Qn	1	2	3	4	5	6	7	8	9	10
Ans	**A**	**B**	**C**	**B**	**D**	**A**	**C**	**A**	**A**	**A**
Qn	11	12	13	14	15	16	17	18	19	20
Ans	**B**	**C**	**D**	**D**	**A**	**D**	**C**	**D**	**D**	**C**