**Assignment 2**

**Department:** Computer Engineering & Applications **Set:** I

**Programme:** B.Tech **Branch: CSE**

**Subject Name:** Computer Network **Subject Code:** BCSC0008

**Year:** II **Semester:** III

Q1) What is the vulnerable time of Pure ALOHA? We have a pure ALOHA network with 100 stations. If Tfr = 1μs. what is the number of frames/s each station can send to achieve the maximum efficiency.

Q2) A 1-Gbps Ethernet with a single store-and-forward switch in the path, and a packet size of 5,000 bits. Assume that each link introduces a propagation delay of 10 μs and that the switch begins retransmitting immediately after it has finished receiving the packet. What is the total transfer delay?

Q3) How Manchester Line Coding Scheme is differing from Differential Manchester Line Coding Scheme. Consider a bit stream 1011011 and draw the Manchester and Differential Manchester Coding?

Q4) A network has a data transmission bandwidth of 20 × 106 bits per second. It uses CSMA/CD in the MAC layer. The maximum signal propagation time from one node to another node is 40 microseconds. What is the minimum size of a frame in the network in byte?

Q5) Explain Cyclic Redundancy Check (CRC). Why this technique is very popular? A bit stream 1101011011 is transmitted using the standard CRC method. The generator polynomial is x4+x+1. What is the actual bit string transmitted?

Q6) Suppose we want to transmit the message, 1011 0010 0111 and protect it from errors using the CRC polynomial x 4 + x 2 +1. Use polynomial long division to determine the message that should be transmitted. Suppose leftmost bit of the message is inverted due to noise on the transmission link. What is the result of receiver’s CRC calculation? How does receiver know that an error has occurred?

Q7) A CSMA/CD network supports data rate of 10Mbps, the maximum distance between any two stations is found to be 2500 m for the correct operation of the collision detection process. What should be the maximum distance if the data rate is increased to 100 Mbps?

Q8) A 3-km long broadcast LAN has 107 bps bandwidth and uses CSMA/CD. The signal travels along the wire at 4 × 108 m/s. What is the minimum packet size that can be used on this network?

Q9) Consider a 3 Mbps token ring LAN and frame size is of 200 byte. If the ring latency is 150 ms, then what will be the effective data rate of the LAN?

Q10) In a network, propagation delay is 100 ms and bandwidth is given as 100 Mbps. Calculate how many RTTs are required for transmitting 40000 bits in stop-and-wait ARQ.

Q11. In the standard Ethernet with the transmission rate of 10 mbps, we assume that the length of the medium is 2500 m and the size of the frame is 512 bits. The propagation speed of a signal in a cable is normally 2\*10^8 m/s. Calculate the transmission delay and propagation delay.

Q12. In CRC coding if the data word is 111111, divisor is 1010 and the remainder is 110. What is the codeword at the receiver?

Q13.The representation of 4 bits code 1101 into 7 bit, even parity Hamming code is?

Q14. In a CDMAlCD network with a data rate of 10 Mbps, the maximum distance between any station pair is found to be 2500 m for the correct operation of the collision detection process. What should be the maximum distance if we increase the data rate to 100 Mbps? To 1 Gbps? To 10 Gbps?

Q15. Can you explain why the vulnerable time in ALOHA depends on Tfr but in CSMA depends on Tp?