

1. Consider the following message  $M=1010001011$ . The cyclic redundancy check(CRC) for this message using the divisor polynomial  $x^5 + x^3 + x^2 + 1$  is:

- (A) 01110                                      (B) 01011  
(C) 10110                                      (D) 01101

2. Given a message "11101101" to be transmitted using CRC polynomial  $x^3 + 1$ . In order to protect it from errors, it will be transmitted as \_\_\_\_\_.

- A. 11101101000                      B. 11101110011  
C. 11101101011                      D. 11101101111

3. A sender uses Selective Repeat ARQ with a window size of 8 frames. Then the sequence number after sending 198 frames is

- A. 0                      B. 6                      C. 8                      D. 15

4. Consider a 5 Kbps channel, which is error-free to send 5 Byte data frames in one direction, a short ACK coming back in the other direction, which is negligible, given propagation delay is 40 ms and throughput is 1 Kbps, the window size is

- A. 2                      B. 3                      C. 4                      D. 5

5. Consider a CSMA/CD network running at 1Gbps over 1Km without repeaters. Given signal speed is the minimum frame size is

- A. 1000 bytes                      B. 1200 bytes                      C. 1250 bytes                      D. 1400 Bytes

6. Consider a network connecting two systems located 8000 kilometres apart. The bandwidth of the network is  $500 \times 10^6$  bits per second. The propagation speed of the media is  $4 \times 10^6$  meters per second. It is necessary to design a Go-Back-N sliding window protocol for this network. The average packet size is  $10^7$  bits. The network is to be used to its full capacity. Assume that processing delays at nodes are negligible. Then, the minimum size in bits of the sequence number field has to be \_\_\_\_\_.

- A. 2                      B. 4                      C. 8                      D. 16

**7. The minimum frame size required for a CSMA/CD base computer network running at 1Gbps on 200 m cable with a link speed of  $2 \times 10^8$  m/s is**

- (a) 125 bytes      (b) 250 bytes      (c) 500 bytes      (d) none of these

**8. A 3000 km long channel is used to transmit 64-byte frames using a protocol. If the propagation speed is 6  $\mu\text{sec/km}$  and the bandwidth of the channel is 1.7Mbps, how many bits should the sequence numbers be to operate efficiently?**

- A. 5      B. 6      C. 7      D. 8

**9. Consider a machine M1 that wants to send a huge file to machine M2 over a TCP connection. Suppose the sequence number for a segment in this connection is S, then, the subsequent segment's sequence number will necessarily be S + 1.**

- A. False  
B. Depends on implementation  
C. True  
D. None

**10. Consider an ethernet of the distance between 2 peers is 500 meters. Is it possible to increase the length of this ethernet to multiple segments if a repeater is added at the end of each segment to connect to another segment?**

- A. Can't say  
B. No  
C. Yes, only if the repeater can have sufficient signal strength.  
D. Yes