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**MCA**  
**(SEM III) THEORY EXAMINATION 2022-23**  
**COMPUTER NETWORKS**

**Time: 3 Hours****Total Marks: 100****Note:** Attempt all Sections. If you require any missing data, then choose suitably.**SECTION A****1. Attempt all questions in brief. 2 x 10 = 20**

- (a) List out components of data communication system.
- (b) Discuss various transmission modes.
- (c) Discover how many times a packet has to visit the network layer and data link layer during a transmission from S to D? Assume that Source S and Destination D are connected through an intermediate router R.
- (d) Discuss CSMA/CD.
- (e) Discuss Dynamic Host Configuration Protocol (DHCP).
- (f) Explain Round-Trip Time (RTT).
- (g) Describe sockets with respect to communication system.
- (h) What is three-way handshaking?
- (i) Discuss role of SMTP in email communication system.
- (j) Define cookies with respect to computer networks.

**SECTION B****2. Attempt any three of the following: 10 x 3 = 30**

- (a) Discuss various computer network topologies with suitable diagrams.
- (b) A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is  $x^3 + 1$ . Show the actual bit string transmitted. Suppose the third bit from the left is inverted during transmission. Show that this error is detected at the receiver's end.
- (c) Consider an IP address 196.10.19.10 /26. Solve the following:
  - (i) Network Address
  - (ii) Custom subnet mask
  - (iii) Total Number of available subnets
  - (iv) Total number of host addresses
  - (v) Subnet address and broadcast address of every subnet.
- (d) Justify the statement "TCP is reliable than UDP". Also elaborate format for TCP packet.
- (e) Write short notes on any two:
  - (i) Domain Name Systems
  - (ii) Telnet
  - (iii) FTP

**SECTION C****3. Attempt any one part of the following: 10 x 1 = 10**

- (a) Discuss various types of transmission media with their applications areas.
- (b) Explain responsibilities each layer in ISO/OSI Model with suitable diagrams.

4. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) Explain Selective Reject and Go-Back-N-ARQ with reference to sliding window protocol.
  - (b) What do you mean error handling at data link layer? Discuss hamming code with suitable example.
5. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) What is need of IP address? Discuss Classful addressing in IPv4.
  - (b) Discuss IPv4 packet format with suitable diagram the at network layer.
6. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) Differentiate between Open Loop and Closed Loop Congestion Control at transport layer.
  - (b) Explain various traffic shaping algorithms.
7. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) Define network security and discuss various network security services in computer networks.
  - (b) Discuss E-mail architectures with its components.