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MCS-042

**MASTER OF COMPUTER
APPLICATIONS (MCA) (REVISED)**

Term-End Examination

June, 2023

**MCS-042 : DATA COMMUNICATION AND
COMPUTER NETWORKS**

Time : 3 Hours

Maximum Marks : 100

Note : (i) *Question No. 1 is compulsory.*

(ii) *Attempt any **three** questions from the rest.*

1. (a) Compare NRZ-L and NRZ-I. Sketch NRZ-L and NRZ-I for the bit stream 01001110001. 5
- (b) Compare point-to-point channels with broadcast channels, with suitable example for each. 5

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- (c) Draw the TCP header format, and discuss each field involved in it. 5
- (d) Different between MACAW and MACA ? 5
- (e) How do connection oriented services run over connectionless services in TCP/IP reference model ? Give suitable diagram. 5
- (f) Briefly discuss the term congestion control and flow control, with suitable example. 5
- (g) Write Leaky Bucket Algorithm. Why should the Leaky Bucket Algorithm allow just one packet per tick, independent of the size of the packet. 5
- (h) Compare UDP and TCP. What are the situations when UDP is preferred over TCP ? 5
2. (a) Compare Slotted Aloha and Pure Aloha. How does Slotted Aloha improve the performance of a system over Pure Aloha ? Also derive the expression for throughput computation of Pure Aloha. 10

- (b) Discuss the Window Management in TCP ?
How the window management in TCP is used for congestion control ? 10
3. (a) What are the various topologies used in LAN Implementation ? “Token rings are better than Ethernet from the delay point of view.” Justify the statement. 10
- (b) What is 3-way handshake protocol in transport layer ? How does it handle lost acknowledgement and delayed acknowledgements ? Illustrate and discuss. 10
4. (a) Explain Token Bucket and Leaky Bucket Algorithms. What are the advantages and disadvantages of Token Bucket Algorithm over Leaky Bucket Algorithm ? 10
- (b) Explain the Diffie-Hellman method for key exchange, through an example. 10

5. (a) Differentiate between any *two* of the following : 10
- (i) SSL and TLS
 - (ii) FDM and TDM
 - (iii) Virtual circuit and Datagram subnet
- (b) What is the Kerberos authentication mechanism ? How is it implemented ? 10