

**MASTER OF COMPUTER
APPLICATIONS (MCA)**

Term-End Examination

December, 2024

**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) What is a computer network ? Explain purposes and requirements of computer networks. 10
- (b) What is CRC method of error detection ? Find the CRC for the data polynomial $x^4 + x^2 + x + 1$, where generator polynomial is $x^3 + 1$. 10

- (c) What is routing ? At which layer of OSI model it occurs ? What are main issues in routing ? Explain different types of routing. 10
- (d) What is TCP/IP ? Explain TCP header format with the help of a diagram. 10
2. (a) What is Remote Procedure Call (RPC) ? Explain how RPC works with the help of a diagram. 10
- (b) What are the limitations of MACA ? Explain how these limitation are overcome in MACAW. 10
3. (a) Explain sliding window protocol using selective repeat and using Go Back N. 10
- (b) Explain Data Encryption Standard (DES) algorithm. 10
4. (a) What is random access protocol ? Derive throughput expressions for pure ALOHA and slotted ALOHA. Also explain the relation between throughput and load in slotted ALOHA. 10

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(b) What is the need of congestion control in computer network ? Explain general principles of congestion control. 10

5. Write short notes on the following : 4×5=20

(a) Piggybacking

(b) Network Topology

(c) OSI model

(d) Synchronous and Asynchronous communication

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