

MCA (Revised)
Term-End Examination
December, 2022

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

Time : 3 hours

Maximum Marks : 100

Note : *Question no. 1 is compulsory. Attempt any three questions from the rest.*

1. (a) What are the different classes of IP address ? Explain through examples. 5
- (b) Differentiate between stream ciphers and block ciphers, with the help of an example for each. 5
- (c) Compare Unipolar Encoding and RZ Encoding. Draw Unipolar Encoding and RZ Encoding for the bitstream 01001100. 5
- (d) What do you mean by multiplexing ? Briefly discuss Frequency Division and Time Division Multiplexing. 5
- (e) Define Data rate and Signal rate. Write the expression to establish relation between them. 5

- (f) What is Sliding Window Protocol ? Why is it useful in satellite links ? 5
- (g) Sketch the Manchester and Differential Manchester for the bitstream 01001110001. 5
- (h) What is CRC ? Find CRC for data polynomial $x^4 + x^2 + x + 1$ with generation polynomial $x^3 + 1$. 5
- 2.** (a) Discuss and illustrate flow control mechanism in the following : 10
- (i) Data link layer
- (ii) Transport layer
- (b) Explain the steps involved in conversion of an analog signal to a digital signal. What is the basis of choice of number of Quantization level ? 10
- 3.** (a) Compare Circuit Switching and Packet Switching. What are the limitations of Circuit Switching ? How does Packet Switching overcome the limitations of Circuit Switching ? 10
- (b) Why are pipeline protocols used in data link layer ? Illustrate Go-back-N, with the help of an example 10

4. (a) Briefly discuss DES. Explain the steps to implement DES, by using appropriate diagram. Why is triple DES used ? 10
- (b) Explain Nagle's algorithm. What is the significance of Nagle's algorithm ? Give a scenario where this algorithm is not applicable. 10
5. (a) How does Link State Routing differ from Distance Vector Routing ? Write steps to implement Distance Vector Routing protocol. 10
- (b) What is Binary Exponential Back-off algorithm ? Explain how it is used in CSMA/CD. 10
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