

**MASTER OF COMPUTER
APPLICATIONS (REVISED)**

Term-End Examination

December, 2023

**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 do you mean by data transmission ?
Explain serial and parallel
communication. 5
- (b) Express period of 100 ms in microseconds
and the corresponding frequency in kHz. 5
- (c) Compare Manchester and differential
Manchester encoding. Draw these encoding
for the bit stream 01001110. 5
- (d) What is the purpose of error detection ?
Define parity bit, single bit and burst
error. 5

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- (e) An analog signal carries 4 bits in each signal unit. If 1000 signal units are sent per second, determine bit rate and baud rate. 5
- (f) Define CRC. Find CRC for a bit stream 1101011011. The generator polynomial is $x^4 + x + 1$. Derive the bit stream to be transmitted. 5
- (g) What is FDM ? Explain the intermodulation noise in FDM. 5
- (h) Explain the need of flow control in computer networks. 5
2. (a) Define framing. Draw the frame for bit stream conversion. What are the different methods of framing ? Give the bit sequence for the data stream 0001110011110001 after adding flag and bit stuffing. 10
- (b) Explain the methods of analog to analog modulation. What is the purpose of PCM ? 10
3. (a) Describe the uses of circuit switching. What are its limitations ? Illustrate the technique used for resolving the circuit switching limitations. 10
- (b) Describe IP address. Explain each of its components. Enlist the different classes of IP addresses and give an example for each one. 10

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4. (a) Explain CSMA protocol. Discuss hidden station and exposed station problem. 10
- (b) Give an example where Bellman Ford algorithm should be applied. Explain the drawback of Bellman Ford algorithm. 10
5. (a) What is digital signature and digital certificate ? Explain the advantages of digital signature. 10
- (b) What is ATM network ? Explain its advantages and disadvantages. 10