

**MASTER OF COMPUTER
APPLICATIONS (MCA-NEW)**

Term-End Examination

December, 2024

**MCS-218 : DATA COMMUNICATION AND
COMPUTER NETWORKS**

Time : 3 Hours

Maximum Marks : 100

Note : (i) *Question No. 1 is compulsory and carries 40 marks.*

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

1. (a) What is the Internet backbone and how does it facilitate data transmission ? 5
- (b) Define Internet Services. Explain its major categories. 5
- (c) Describe star topology and discuss its advantages and disadvantages. 5

- (d) Define data rate and signal rate. An analog signal carries 4 bits per signal and 1000 signal elements are sent per sec. Compute the bit rate. 5
- (e) Draw constellation diagram for 4 PSK and 4 QAM. 5
- (f) Draw Manchester and Differential Manchester encoding for the bit sequence 001100110011. 5
- (g) Data link protocol almost always put CRC in trailer rather than in header. Why ? 5
- (h) Illustrate the process of PCM with the help of a diagram. 5
2. (a) Differentiate between 10 Base T and 10 Base F. What is the minimum and maximum length of IEEE 802.3 Ethernet frame ? 5
- (b) Explain hidden station and exposed station problem. 5

- (c) Describe the operations of bridges in different LAN environment. 5
- (d) Explain the services of Network layer. 5
- 3. (a) Discuss the format of an IP datagram and the process of IP datagram fragmentation. 5
- (b) Discuss the concept of Quality of Service in transport services. 5
- (c) Define cryptography. Why is it important in Network security ? 5
- (d) Explain some of recent cyber attacks and their impacts. 5
- 4. (a) Describe stop and wait flow control mechanism. What is the limitation of it ? Which flow control protocol is used to overcome these limitations ? 8
- (b) Compare and contrast the virtual circuit approach with datagram approach in packet switching. 6
- (c) Explain different applications of WSN. 6

5. (a) Define routing problem. Explain shortest path routing algorithm. 7
- (b) Differentiate between Traffic Policy and Traffic Shaping. 6
- (c) Describe the usecases of IoT in home automation, smart cities, environment and health. 7

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