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MCS–218

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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