PAPER ID-310561

Roll No: | | | | | | | | | | | | | |

MCA
(SEM III) THEORY EXAMINATION 2024-25
COMPUTER NETWORK

TIME: 3 HRS **M.MARKS: 100**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q no.	Question	CO	Level
a.	Discuss Jitter with the help of an example.	1	K2
b.	Explain the various types of transmission modes.	1	K2
c.	Differentiate between single bit and burst error.	2	K2
d.	Write difference between Pure Aloha and Slotted Aloha.	2	K1
e.	Explain the difference between a public and a private IPv4 address.	3	K2
f.	What does CIDR notation /24 mean in IPv4 addressing?	3	K1
g.	Explain port address.	4	K2
h.	Differentiate between Open Loop and Closed loop techniques of Congestion control.	4	K2
i.	How NVT is helpful at the time of data transmission in Telnet.	5	K1
j.	Write the port number used in File Transfer Protocol.	5	K1

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a.	Explain the advantages and disadvantages of ISO-OSI model.	1	K2
b.	A message 110101 is to be transmitted using CRC with a generator polynomial $x^3 + x + 1$. Show the steps to calculate the CRC codeword and verify it at the receiver's end.	2	K3
c.	Illustrate the DHCP (Dynamic Host Configuration Protocol) and its function in the assignment of IP addresses to network devices.	3	K3
d.	Describe the structure of a TCP segment. Highlight and explain the purpose of important fields in the TCP header, such as source port, destination port, sequence number, acknowledgment number, flags, window size, and checksum.	4	K2
e.	Discuss various types of Email Architectures with the help of neat diagram.	5	K2

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Explain the various types of topologies with their advantages and disadvantages.	1	K2
b.	Explain various types of guided transmission media with the help of neat diagram.	1	K2

4. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Given the 4-bit data 1011, calculate the Hamming code (7-bit codeword) for the given data. Show the following steps: • Determine the positions for the parity bits. • Calculate the parity bits for the codeword. • Write the final 7-bit Hamming code.	2	K3

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b.	What is the significance of the persistence strategy (1-persistent, non-persistent, and p-persistent) in CSMA protocols? Explain with examples.	2	K2

5. Attempt any *one* part of the following: 10 x 1 = 10

a.	The organization has been assigned the IP address 192.168.10.0/26 by the Internet Service Provider (ISP). The goal is to efficiently divide this network into smaller 3 subnets i.e. 32, 16, 16 addresses. Calculate the network address, last usable address, and number of addresses for each subnet.	3	K3
b.	Explain the basic concept of distance vector routing. How do routers exchange routing information using this protocol?	3	K2

6. Attempt any *one* part of the following: 10 x 1 = 10

a.	Demonstrate the role of the checksum field in the UDP header with the help of an example	4	K3
b.	Illustrate the process of TCP connection establishment using the Three-Way Handshaking process. Describe each of the three steps involved in establishing a TCP connection.	4	K3

7. Attempt any *one* part of the following: 10 x 1 = 10

a.	Define cryptography. Give the classification of cryptography.	5	K2
b.	Discuss functions of network management. Explain the working of Simple Network Management Protocol.	5	K2