MCA
(SEM V) THEORY EXAMINATION 2023-24
COMPUTER NETWORKS
MODEL PAPER-2

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

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

a.	What is need of layered architecture in ISO/OSI model.
b.	List out three fundamental characteristics that determines the effectiveness of the data communication system?
c.	What is Intranet?
d.	What are the criteria used to evaluate transmission medium?
e.	What is Bluetooth?
f.	Discuss count-to-infinity problem.
g.	What is split horizon?
h.	What is the maximum window size for data transmission using the selective reject protocol with n-bit frame sequence numbers?
i.	What is the name of Protocol Data Unit (PDU) at application layer?
j.	Which application layer protocol supports electronic mail?

SECTION B

2. Attempt any *three* of the following: 10x3=30

a.	Discuss network classification based on geographical scale.
b.	What do you mean by ALOHA? Consider a situation, where a large population of ALOHA users manages to generate 50 requests/sec, including both originals and retransmissions. Time is slotted in units of 40 msec. (a) What are the chances of success on the first attempt? (b) What is the probability of exactly k collisions and then a success? (c) What is the expected number of transmission attempts needed?
c.	Discuss IPv4 frame format.
d.	Compare and contrast SymmetricKey Cryptography and AsymmetricKey cryptography.
e.	Write short note on: (i) TELNET (ii) FTP

SECTION C

3. Attempt any *one* part of the following: 10x1=10

a.	Explain various network topologies along with their relative advantages and disadvantages
b.	Discuss architecture and responsibilities of each layer in TCP/IP model.

4. Attempt any *one* part of the following: 10x1=10

a.	List out various error detection techniques? Discuss hamming code with suitable example.

b.	Discuss sliding window-based flow control techniques at data link layer.

5. Attempt any *one* part of the following: 10x1=10

a.	What is need of routing algorithms? Discuss the classification of routing algorithms.
b.	What do you mean by IP address? Consider an IP Address 142.10.20.12. An administrator need only 1024 hosts persubnet. Find out the following: 1. Class of IP address 2. Default Subnet Mask 3. Custom subnet Masks 4. Number of subnets 5. Number of bits borrowed 6. Number of hosts per subnet 7. Number of usable hosts per subnet 8. Subnet Address of second subnet. 9. Broadcast Address of second subnet

6. Attempt any *one* part of the following: 10x1=10

a.	What do you mean by congestion? Discuss open and closed loop methods to control the congestion.
b.	Explain three-way handshaking protocol to establish connection at transport layer. Also discuss two army problem.

7. Attempt any *one* part of the following: 10x1=10

a.	Discuss various E-mail components. Also elaborate various E-mail architectures.
b.	What is purpose of Domain Name Systems? Discuss three main classification of domain name space.