

# END TERM EXAMINATION

FIRST SEMESTER (MCA) JANUARY 2024

Paper Code: MCA-103

Subject: Computer Networks

Time: 3 Hours

Maximum Marks: 60

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

- Q1 Attempt questions (any four): - [3x4=12]
- a) What do you understand with digital signal encoding (digital to digital encoding) techniques? Why these techniques are needed? convert the following bit stream into a digital signal using Manchester encoding technique.  
101000010
  - b) Compare wired and wireless transmission mediums in terms of speed, security and scale. Explain the hidden station and exposed station problems with proper diagrams.
  - c) Differentiate between CSMA and CSMA/CD.
  - d) What is CIDR? How does it solve the problem of shortage of IPv4 addresses?
  - e) Explain the technique of Checksum calculation with proper example.

### UNIT-I

- Q2 a) What is analog to digital encoding? What is its use in data communication? Explain the PCM technique in detail. (7)
- b) What is MODEM? How does it make the communication possible between two remote machines? (5)
- Q3 Explain the layered architecture? Why Network models have been designed using layered architecture? Explain layers of TCP/IP model in detail. (12)

### UNIT-II

- Q4 Differentiate between error detection and retransmission technique and error detection and correction techniques. Explain the scenarios in which these techniques are preferred. Encode following data word using Hamming code with even parity. (7)
- 1001001000011101
- Explain Stop and Wait ARQ with an example and required diagrams. (5)
- Q5 a) Explain Ethernet frame format in detail. What is the need of padding in it? (7)
- b) Explain DCF Medium Access Control (MAC) method of wireless LAN networks in detail. (5)

### UNIT-III

- Q6 Explain the IPv4 address classes with their features. How address distribution was done in classful addressing method? Explain. (5)
- What is link state routing algorithm? Explain the method of routing table population in Link State routing. (7)

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- Q7 a) Explain IPv6 address auto configuration process. What happens, when the autoconfiguration process gets fail. (5)
- b) Explain the Multicast routing protocols based on source-based tree and group shared tree methods. (7)

### UNIT-IV

- Q8 a) Explain TCP protocol header in detail. (7)
- b) Mention the applications where UDP protocol is used with proper reason. (5)
- Q9 a) Explain the process of mail transfer including all the necessary components of the process. Include proper diagrams if needed. (6)
- b) Explain Private and public key cryptography with their Pros and Cons. For large amount of data transfer which one would be preferred? (6)

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