



**End Term (Odd) Semester Examination December 2024**

Roll no.....

Name of the Course and semester: MCA I semester

Name of the Paper: COMPUTER NETWORKS

Paper Code: TMC- 102

Time: 3-hour

Maximum Marks: 100

**Note:**

- (i) All the questions are compulsory.
- (ii) Answer any two sub questions from a, b and c in each main question.
- (iii) The total mark for each question is 20 (twenty).
- (iv) Each sub-question carries 10 marks.

- (2X10=20 Marks) CO 1
- Q1.**
- a. Discuss data communication and its component in detail? Describe LAN MAN WAN. List different types of guided transmission modes with example.
  - b. Write about the functionality of layers in OSI network model also Compare OSI and TCP/IP Network models.
  - c. With the help of a suitable example, discuss different types of delays in network. What are the propagation time and the transmission time for a 6-MB (megabyte) message (an image) if the bandwidth of the network is 2 Mbps? Assume that the distance between the sender and the receiver is 12,000 km and that light travels at  $2.4 \times 10^8$  m/s

- (2X10=20 Marks) CO 2
- Q2.**
- a. Explain in detail about the function and structure of e-mail protocol. Explain briefly about SMTP and pop3 protocol.
  - b. Write in detail about DNS Name Space and Domain Resource records. Discuss about File Transfer Protocol with neat diagram
  - c. Discuss in detail about the world wide web. Discuss the features of HTTP and explain how HTTP works.

- (2X10=20 Marks) CO 3
- Q3.**
- a. Analyze and discuss the main services provided by Transport layers? Compare TCP and UDP also mention some common applications of TCP and UDP?
  - b. (i) Enumerate the mechanism of three-way handshake protocol for TCP.  
(ii) Briefly discuss check sum In UDP.
  - c. With the help of suitable diagrams, Discuss the main features and differences
    - (i) GO BACK N ARQ
    - (ii) Selective repeat ARQ



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Q4.

(2X10=20 Marks) CO 4

- a. Write about the design issues of Network layer. Explain Virtual circuit network and Datagram network with diagrams.
- b. Explain the structure of an IPv4 address. Describe the various transition mechanisms from IPv4 to IPv6.
- c. Explain about the Routing algorithms. State the major difference between distance vector routing and link state routing.

Q5.

(2X10=20 Marks) CO5

- a. Describe the different techniques for detecting errors in data transmission?? Explain Cyclic Redundancy check method used for error detection Obtain the 4-bit CRC code for the data bit sequence 10011011100 using the polynomial  $x^4 + x^2 + 1$ .
- b. Provide the operational principles of Pure ALOHA, Slotted ALOHA. Discuss the role of CSMA/CD protocol in ethernet.
- c. Analyze and compare the following with the help of suitable diagrams:
  - (i) PAM, PCM
  - (ii) ASK, PSK, FSK
  - (iii) Unipolar, polar and bipolar