



Term Evaluation (Odd) Semester Examination September 2025

Roll no.....

Name of the Course: MCA AI&DS

Semester: 1st

Name of the Paper: Computer Networks

Paper Code: TMD112

Time: 1.5 hour

Maximum Marks: 50

Note:

- (i) Answer all the questions by choosing any one of the sub-questions
- (ii) Each question carries 10 marks.

Q1.

(10 Marks)

- a. Define data communication and list its fundamental characteristics. Illustrate with a block diagram the key components of a generic communication system, giving a real-world example for each component. (CO1)

OR

- b. What is the main difference between circuit switching and packet switching? Why is packet switching used for the internet? (CO2)

Q2.

(10 Marks)

- a. Justify the need for layered architecture in networks. Map the layers of the TCP/IP protocol suite to the OSI model, highlighting the key functions of each layer and discussing the conceptual differences between the two models. (CO1)

OR

- b. Categorize transmission media into guided and unguided types. For each category, analyze two specific media in terms of bandwidth, susceptibility to interference, cost, and typical use cases in modern networking. (CO2)

Q3.

(10 Marks)

- a. Elaborate on the key design decisions involved in creating a network application. Compare the client-server and peer-to-peer paradigms by discussing their scalability, reliability, and management overhead. Provide a contemporary example of each. (CO1)

OR

- b. Explain the client-server interaction using HTTP. Describe the structure of both HTTP requests and response messages. Discuss how statefulness is maintained in the stateless HTTP protocol using cookies, and the role of a proxy server as an intermediary. (CO2)

Q4.

(10 Marks)

- a. Explain the working of the Email system in detail. Discuss SMTP and compare it with POP3 and IMAP. (CO1)

OR

- b. Explain the functions of the Transport Layer in the OSI model. How does it provide process-to-process (CO2)



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Q5.

(10 Marks)

a. A 2000-byte packet is sent over a link with a transmission rate of 2 Mbps. The propagation distance is 1500 km, and the propagation speed is 2.5×10^8 m/s. Calculate the transmission delay and the propagation delay. (CO1)

OR

b. Explain the Peer-to-Peer (P2P) file distribution process using the BitTorrent protocol as an example. (CO2)