Hall Ticket No | | | | | | | | | | | Question Paper Code: AITD04

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal-500043, Hyderabad

B.TECH IV SEMESTER END EXAMINATIONS (REGULAR) - JUNE 2025
Regulation: BT23

COMPUTER NETWORKS

Time: 3 Hours (COMMON TO CSE | CSE(AI&ML) | CSE(CS) | IT) Max Marks: 60

Answer ALL questions in Module I and II
Answer ONE out of two questions in Modules III, IV and V
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

MODULE – I

1. (a) Explain the role of the network interface card (NIC) in a network. Analyze the advantages of the TCP/IP model over the OSI model in modern networking. [BL: Understand| CO: 1|Marks: 6]

   (b) Evaluate the effectiveness of peer-to-peer networks compared to client-server networks. Differentiate between baseband transmission and broadband transmission. [BL: Understand| CO: 1|Marks: 6]

MODULE – II

2. (a) What is the function of the data link layer? Explain the concepts of error detection and correction in the data link layer. [BL: Understand| CO: 2|Marks: 6]

   (b) Elucidate how the CSMA/CD protocol works in Ethernet networks. Propose an error control mechanism for a new data communication system. [BL: Apply| CO: 2|Marks: 6]

MODULE – III

3. (a) Analyze the potential routing issues in a network. Mention advantages and limitations of using IPv6 over IPv4 in modern networks. [BL: Understand| CO: 3|Marks: 6]

   (b) Your organization is expanding its network, and you need to choose a routing algorithm that adapts well to frequent changes in topology. How would you apply the principles of a link-state routing algorithm in this situation? Outline the steps for implementation. [BL: Apply| CO: 3|Marks: 6]

4. (a) Outline the need of flow control. Discuss the common approaches for flow control in data link layer. [BL: Understand| CO: 4|Marks: 6]

   (b) A large enterprise network is divided into multiple areas, each using OSPF as its routing protocol. How would you configure OSPF to ensure efficient routing between areas and prevent routing loops? [BL: Apply| CO: 4|Marks: 6]

MODULE – IV

5. (a) Describe the TCP three-way handshake process. Compare and contrast UDP & TCP with suitable example. [BL: Understand| CO: 5|Marks: 6]

   (b) Interpret and explain the effects of congestion on network performance and how TCP's congestion control mechanisms address these issues. [BL: Apply| CO: 5|Marks: 6]

6. (a) List out the functions of transport layer. Distinguish between network layer delivery and the transport layer delivery. [BL: Understand| CO: 5|Marks: 6]

   (b) A company's internal network is experiencing slow file transfers despite having high bandwidth. How would you tune TCP settings to improve performance? Mention the steps you would take and the TCP parameters you would adjust. [BL: Apply| CO: 5|Marks: 6]

MODULE – V

7. (a) How does MPLS enhance network performance compared to conventional routing techniques? Describe the different types of services provided by the link layer. [BL: Understand| CO: 6|Marks: 6]

   (b) Design a basic LAN for a small office (10 users) using Ethernet technology. Draw a simple topology diagram. [BL: Apply| CO: 6|Marks: 6]

8. (a) Summarize about data centre network. Why is it important? Differentiate between frame switching and packet switching. [BL: Understand| CO: 6|Marks: 6]

   (b) What is a LAN switch? How does it differ from a hub in functionality? Describe how MAC address learning works in a switch. [BL: Understand| CO: 6|Marks: 6]

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