Reg. No.													

Question Paper Code	13376

M.E. / M.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024 (JAN - 2025)
First Semester
M.E. - Computer Science and Engineering (with Specialization in Networks)
24PCNPC103 - ADVANCED COMPUTER COMMUNICATION AND NETWORKING
Regulations - 2024

Duration: 3 Hours   Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
Answer ALL Questions

		Marks	K-Level	CO
1.	Why protocols are important for the effective communication?	2	K1	CO1
2.	Differentiate a port address, a logical address, and a physical address.	2	K2	CO1
3.	Mention two key features of ring networks shared with the Ethernet.	2	K1	CO2
4.	Compare and contrast Hubs, Switches and Routers.	2	K2	CO2
5.	Why is BGP preferred for Internet routing?	2	K1	CO3
6.	How does Traffic Engineering improve network performance?	2	K1	CO3
7.	List the key components of traffic management.	2	K2	CO4
8.	Mention the importance of queue analysis in network management.	2	K1	CO4
9.	Differentiate between SNAT and DNAT.	2	K2	CO5
10.	How do adjusting Quality of Service (QoS) settings help in network tuning?	2	K1	CO5

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

11.	a)	i)	Explain the roles of each component within the network architecture and their impact on network performance and efficiency.	7	K2	CO1
		ii)	Describe the different types of networks based on their size and geographic coverage. Provide examples of how each network type is utilized in real-life applications.	6	K2	CO1

OR

	b)	Explain the functionalities of various protocols in each of the layer of the OSI Model and illustrate how communication is taking place between two end systems.	13	K2	CO1

12.	a)	Explain the functionalities of circuit switching and packet switching in the context of network communication and discusses their suitability for different types of applications such as voice calls, video streaming, and data transfer. How each method handles issues like latency, bandwidth efficiency, and reliability? Justify with an appropriate example.	13	K2	CO2

OR

b)	Describe the roles and functions of various wired and wireless network devices and compare different transmission media types, including twisted pair cables, coaxial cables, fiber optics, and wireless media.	13	K2	CO2

13. a) Explain how the Subscriber Network Interface (SNI) and Subscriber Interface Access Protocol (SIP) work together in SMDS to ensure reliable data transmission. | 13 | K2 | CO3

OR

b) i) With an example network scenario explain the mechanism of Routing Information Protocol and specify the routing table contents. | 8 | K2 | CO3

ii) Identify the characteristics of BGP as exterior gateway protocol. | 5 | K2 | CO3

14. a) i) Discuss how SSL certificate management and validation processes contribute to web security. | 7 | K2 | CO4

ii) Explain how traffic analysis and monitoring systems contribute to web security. | 6 | K2 | CO4

OR

b) Explain in details about the working principles of Random Early Detection (RED) queue management algorithm and their effectiveness in managing network congestion and ensuring Quality of Service. | 13 | K2 | CO4

15. a) i) Explain the security implications of implementing transparent proxies versus traditional proxies in an enterprise environment. | 7 | K2 | CO5

ii) Discuss how Layer 7 filtering differs from packet filtering. | 6 | K2 | CO5

OR

b) Evaluate the various backbone network topologies available for enterprise deployment and analyze their advantages and disadvantages in terms of reliability, cost, and performance. | 13 | K2 | CO5

PART - C (1× 15 = 15 Marks)

16. a) i) Compare and contrast Frequency Division Multiplexing (FDM), Time Division Multiplexing (TDM), and Statistical Multiplexing (SM) in terms of their efficiency, complexity, and suitability for different types of network traffic. | 9 | K2 | CO2

ii) Discuss the factors that impact the performance and speed of Ethernet networks. | 6 | K2 | CO2

OR

b) Given the following network topology in an OSPF domain: | 15 | K3 | CO3
   - Router N1 has links to Router N2 and Router N3.
   - Router N2 has links to Router N1, Router N4, and Router N5.
   - Router N3 has links to Router N1 and Router N6.
   - Router N4 has links to Router N2 and Router N7.
   - Router N5 has links to Router N2.
   - Router N6 has links to Router N3.
   - Router N7 has links to Router N4.

   Create the LSDB for Router N1, assuming that each router advertises its link-state informationand determine the Shortest Path Tree (SPT) from Router N1 and Identify the optimal paths to all other routers.

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create