Question Paper Code | 14152

M.E. / M.Tech. - DEGREE EXAMINATIONS, NOV / DEC 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 (MCQ) (10 × 1 = 10 Marks)
Answer ALL Questions

			Marks	K-Level	CO
1.	_____ layer converts data into electrical, radio or optical signals?		1	K1	CO1
	(a) Data Link (b) Physical (c) Network (d) Session				
2.	The total number of unique IPv4 addresses is		1	K1	CO1
	(a) 2^{16} (b) 2^{32} (c) 2^{64} (d) 2^{128}				
3.	A media converter is used to		1	K1	CO2
	(a) Amplify digital signals (b) Connect different types of media (e.g., fiber and copper)				
	(c) Encode digital data (d) Filter network traffic				
4.	In a telephone network, which device converts analog voice signals to digital form?		1	K1	CO2
	(a) Modem (b) Switch (c) Repeater (d) Multiplexer				
5.	RIP uses which routing metric?		1	K1	CO3
	(a) Bandwidth (b) Hop count (c) Delay (d) Cost				
6.	BGP is primarily used for		1	K1	CO3
	(a) Interior routing within a single network (b) Routing between autonomous systems				
	(c) Routing within LANs (d) Multicast transmission only				
7.	_____ of the following is a protocol used to secure web communication?		1	K1	CO4
	(a) HTTP (b) FTP (c) SSL (d) ICMP				
8.	Which of the following is not a quality characteristic of a web service?		1	K1	CO4
	(a) Usability (b) Reliability (c) Confidentiality (d) Randomness				
9.	A DMZ (Demilitarized Zone) in networking is used to		1	K1	CO5
	(a) Isolate internal servers from the internet (b) Speed up network traffic				
	(c) Encrypt network packets (d) Store user passwords				
10.	The main function of a backbone network is to _____		1	K1	CO5
	(a) Manage IP addressing (b) Provide high-speed connectivity between subnetworks				
	(c) Filter packets (d) Translate IP addresses				

PART - B (12 × 2 = 24 Marks)
Answer ALL Questions

		Marks	K-Level	CO
11.	Compare IPV4 and IPV6.	2	K2	CO1
12.	Name any two protocols that operate at the Application layer of the TCP/IP model.	2	K2	CO1
13.	Examine bridge, and how does it differ from a router?	2	K3	CO2
14.	What is attenuation, and how can it be minimized?	2	K2	CO2
15.	What are the challenges of RIP in large networks?	2	K2	CO3
16.	How does OSPF differ from distance-vector protocols?	2	K2	CO3
17.	List any two quality characteristics of web services.	2	K2	CO4
18.	Define confidentiality in the context of web security.	2	K1	CO4
19.	Differentiate between a traditional proxy and a transparent proxy.	2	K2	CO5
20.	How does NAT contribute to network security?	2	K2	CO5
21.	List two examples of web-based applications requiring high security.	2	K2	CO4
22.	Define Port Forwarding with one example.	2	K1	CO5

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **14152**

PART - C (6 × 11 = 66 Marks)
Answer ALL Questions

23. a) Explain the evolution and advantages of the TCP/IP protocol suite over the OSI model.   *11*   *K2*   *CO1*

OR

b) Explain in detail about the concept of addressing in computer networks.   *11*   *K2*   *CO1*

24. a) Consider a city telephone network evolving into a modern IP-based system. Discuss networking principles like reliability, scalability, and QoS (Quality of Service) in this context.   *11*   *K6*   *CO2*

OR

b) You are tasked to integrate a traditional telephone network with a new VoIP system in an organization. Discuss the role of routers and switches in maintaining call quality.   *11*   *K6*   *CO2*

25. a) Examine how multicast routing reduces bandwidth consumption for Video Streaming.   *11*   *K5*   *CO3*

OR

b) Summarize how MPLS (Multiprotocol Label Switching) can be used in Traffic Engineering for ISP.   *11*   *K5*   *CO3*

26. a) Explain the working of the Secure Socket Layer (SSL) protocol.   *11*   *K2*   *CO4*

OR

b) Discuss the major challenges in ensuring Web Security in modern applications.   *11*   *K2*   *CO4*

27. a) Illustrate the role and functioning of proxy servers in network communication.   *11*   *K2*   *CO5*

OR

b) Summarize Packet Filtering and Layer 7 Filtering with an example.   *11*   *K2*   *CO5*

28. a) A new startup wants to develop an internal IT infrastructure that supports file sharing, cloud access, video conferencing, and security. Describe the type of network architecture (client-server, peer-to-peer, or hybrid) you would recommend.   *11*   *K3*   *CO1*

OR

b) A Software team is designing a secure communication system for an online banking service. Explain how the OSI model supports secure and reliable data Exchange.   *11*   *K3*   *CO1*

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