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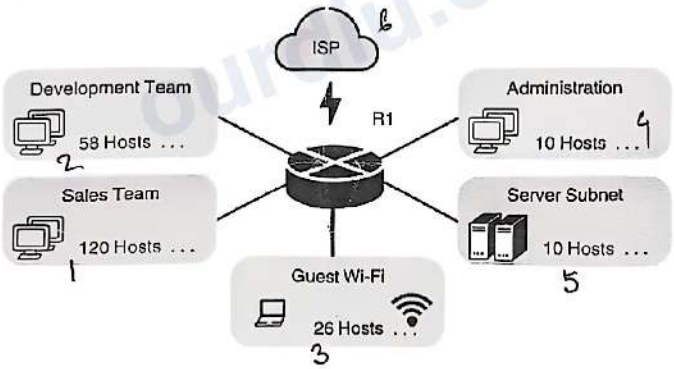
Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Final Examination, Summer 2026
Course Code: CSE321, Course Title: Computer Networks
Level: 3 Term: 2 Batch: 66

Time: 2 Hrs **Marks: 40**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially. Short and exact answers are appreciated and try to add figures with answers where applicable]

1		TechNova Solutions is assigned the network 192.168.50.0/24. Apply VLSM to design an efficient IP addressing scheme for Development Team, Sales Team, Administration, Guest Wi-Fi and Server Subnet as following requirements. For every subnet, calculate the Network Address, Subnet Mask, Usable Host Range, and Broadcast Address. 	[5]	CO3
2	A	Imagine a company is gradually moving from an old IPv4-only network to a modern IPv6 network. During this transition, some devices still use only IPv4, some use only IPv6, and parts of the internet still support only IPv4. What possible methods can the company use so that all devices can communicate successfully with each other during this transition? Explain each method and draw a simple, clearly labeled diagram to illustrate them.	[5]	
	B	Simplify the following IPv6 address to its shortest possible form using standard compression rules and show the steps. 2001:0DB8:0000:0000:0000:0000:00A5:0001	[2]	
3	A	How does an Ethernet switch use the self-learning process to dynamically build and maintain its MAC address table? Then apply your understanding to the following scenario: A new data frame arrives at Port 3 of a switch. The destination MAC address of the frame is 00:1A:2B:3C:4D:5E. Explain the specific action the switch will take and why in each of the following three independent cases: 1. The destination MAC address is already in the switch's table and is mapped to Port 8. 2. The destination MAC address is currently missing from the switch's table. 3. The destination MAC address is in the switch's table and is mapped to Port 3.	[5]	CO1

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	B	Ethernet is still the most widely used wired LAN technology in homes, offices, and data centres even after many years. What could be the possible reasons that Ethernet continues to remain so popular?	[2]	
4	A	A network administrator wants to avoid congestion before it happens. To do this, the administrator makes some planned decisions or policies in advance, such as how to retransmit lost packets, how to handle packet dropping when buffers are full, and how to manage acknowledgement messages. Identify the congestion control technique being used in this situation and explain how these pre planned decisions help reduce the chance of congestion occurring in the network.	[5]	CO2
	B	A user opens a web browser and accesses a website using HTTPS to view webpages, images, and other important content. Since the data must arrive correctly, reliably and in the proper order, the choice of transport protocol is important. Between TCP and UDP, which protocol is more suitable for HTTPS-based web browsing? State the reasons with reference to reliability and connection type.	[2]	
5	A	A telecommunications company is deploying a standard 2G (GSM) cellular network to provide reliable voice calling and SMS services to a remote, newly developed town. Based on this deployment scenario, Illustrate the 2G (GSM) network architecture with a labelled diagram for data and voice traffic and briefly explain the main components.	[5]	CO1
	B	Identify the components of a wireless network with relevant diagram	[2]	
6	A	A company wants to securely transfer confidential employee salary data between its HR server and the finance department using a cryptographic system. Draw a labelled diagram of a cryptographic system and explain how each component or element would be used in this specific scenario.	[5]	CO4
	B	An unauthorized user gains access to a network router (being attacked) at a corporate office and begins monitoring two different communication streams: Stream A: The attacker intercepts unencrypted FTP traffic and successfully reads the contents of a confidential financial report being transferred. Stream B: The attacker intercepts messages between two employees, modifies some of the data in the packets, and then forwards the altered messages to the original destination without being detected. Identify the specific type of attack occurring in Stream A and Stream B. Justify your answer in each case.	[2]	