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COMSATS UNIVERSITY ISLAMABAD, ABBOTTABAD CAMPUS

Department of Computer Science

Midterm EXAMINATION FALL 2024

Class: BCS-3A
Subject: Computer Networks
Total Time Allowed: 3 hours
Name [redacted]

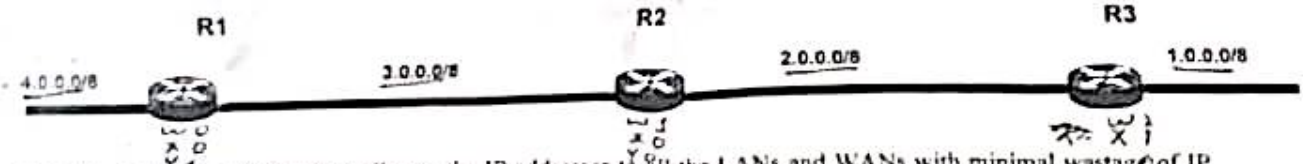
Date: 17-01-2025
Instructor: Dr. Javid Ali
Max Marks: 100
Registration # [redacted]

Question 1: Briefly describe network packet delay, packet loss, and throughput. Highlight the key factors that affect these network performance parameters. CLO-1 (10 Marks)

Question 2: Solve the following problems. **[40 Marks]** CLO-2

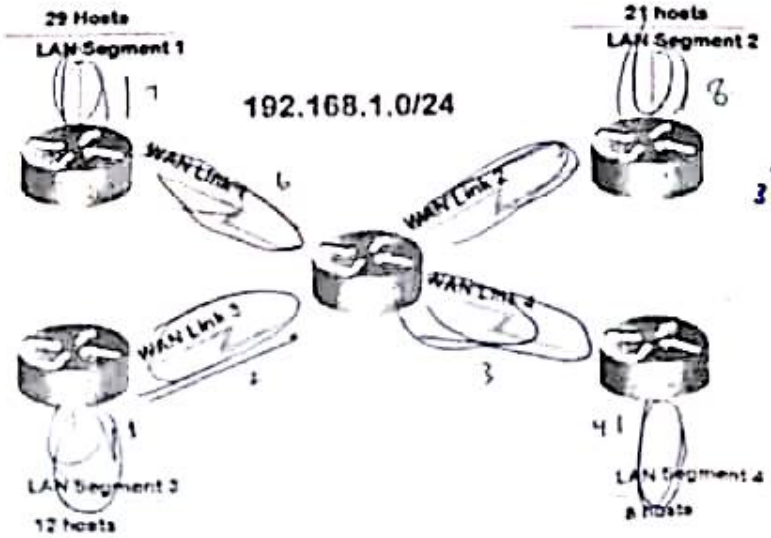
2.1: Let the receiving node receive 11011101101. The error detection method used is cyclic redundancy check with a common generator G=1001. Use CRC to find whether there is any error in the received data. (10 Marks)

2.2: Apply distance vector routing algorithm to calculate forwarding tables of the following routers. Show the routing state after each iteration final state after convergence. (15 Marks)



2.3: Subnet the given IP block to allocate the IP addresses to all the LANs and WANs with minimal wastage of IP addresses. Tabulate the following information about each segment. (15 Marks)

No.	Segment	Host requirement	Network address	1st Valid host address	Last valid host address	Broadcast address	Subnet mask



Question 3: Answer the following questions: [30 Marks] CLO-3

3.1: Discuss the advantages and disadvantages of the iterative vs recursive DNS query resolution process. Use a diagram to support your answer. (10 Marks)

3.2: Highlight the key differences between intra-domain and inter-domain routing. Give one example of a routing protocol that falls under each category. (10 Marks)

3.3: Assume a host A sends 10 packets to host B using TCP. Analyze the behavior of TCP congestion control if the 5th packet is lost. Draw a time diagram to show the congestion window size on each step and after the duplicate acknowledgments are received against the 6th and 7th packets for the 5th packet. (10 Marks)

Question 4: Answer the following questions: [20 Marks] CLO-4

4.1: Describe "packet sniffing", "IP Spoofing", and "denial of service" attacks that compromise network security. (10 Marks)

4.2: Explain cryptography and its use in network security. (10 Marks)

