



Daffodil International University
Faculty of Science & Information Technology
Department of Software Engineering

Final Examination, Spring 2026

Course Code: SE-225

Course Title: Data Communication & Computer Networking

Sections & Teachers: KBB (A) , RT (B, C, J), AMR (D, E, F), MH (G, H), HBM (I)

Time: 2:00 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.]

1.	a)	Examine the differences between Classful and Classless Addressing.	[Marks-2]	CLO-1 Level-3
	b)	Illustrate the HTTP request–response cycle.	[Marks-3]	
2	You are the lead network engineer for a new deep-space satellite communication relay. The satellite transmits telemetry data, operational commands, and image packets back to the Earth station. Because cosmic radiation frequently causes bit-flips during transmission, your team has decided to implement different error detection and correction schemes for different types of data payloads based on their priority and processing constraints.			CLO-3 Level-3
	a)	Suppose, the Parity Coverage Rules are; P1 -----> D3 D5 D7 P2 -----> D3 D6 D7 P4 -----> D5 D6 D7 Now, If the satellite uses an Even-Parity Hamming Code for error correction. Compute the final transmitted codeword for the 4-bit command 1010 .	[Marks-4]	
	b)	If the satellite system uses a Cyclic Redundancy Check (CRC) to detect burst errors in image payloads. Given the generator polynomial $x^3 + x^2 + 1$, apply your knowledge on CRC to find the final transmitted frame for the data message 1001 .	[Marks-4]	
	c)	A satellite system uses a standard Internet Checksum for routine telemetry data. Given the two 8-bit data blocks 10101010 and 11001100 , derive the final 8-bit checksum to be transmitted. Show all calculation steps.	[Marks-4]	
3.	a)	Identify the subnet mask, network address, broadcast address, and range of valid host addresses of the IP address 136.112.17.23.	[Marks-4]	CLO-4 Level-4
	You are designing an IPv4 addressing plan for a medium-sized office network. Your ISP has allocated the address block:			

11000101.10100000.00101000.00000000/27		
Based on this scenario, answer question b, c & d.		
b)	Transform the given IP address into its decimal representation and identify the subnet mask.	[Marks-2]
c)	Examine each subnet and identify the network ID, broadcast IP, and range of usable host IP addresses for every subnet.	[Marks-7]
d)	Suppose a corporate office needs to design its internal network. The office has been allocated a single IP network block and must divide it efficiently among its departments. The organization consists of the following departments with their respective number of devices: - HR Department: 18 devices - Finance Department: 26 devices - IT Support Department: 64 devices - All department are connected with each other via wan link Identify subnet masks and CIDR for each department.	[Marks-5]
A Weighted Network Graph is given below: <pre> graph TD A((A)) --- 5 B((B)) A --- 8 D((D)) B --- 12 C((C)) B --- 3 D C --- 10 E((E)) D --- 4 E B --- 7 E </pre>		
Based on this scenario, answer question e.		
e)	Identify the initial routing table for each node in the network. Trace the Distance Vector algorithm to figure out the updated routing tables for Node B, Node D.	[Marks-5]

CLO-4
Level-4