



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
	c)	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]	
	e)	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:

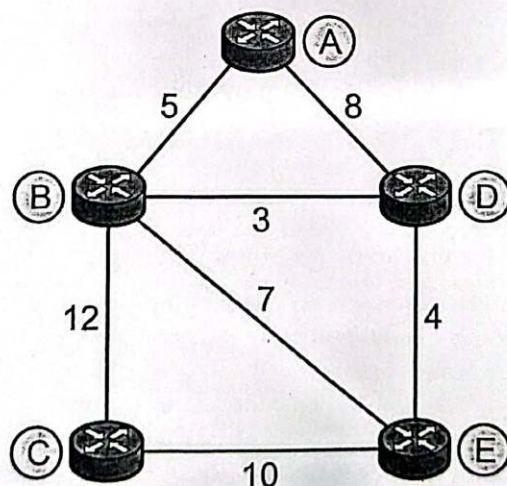
- HR Department: 18 devices
- Finance Department: 26 devices
- IT Support Department: 64 devices
- All department are connected with each other via wan link

Identify subnet masks and CIDR for each department.

[Marks-5]

27
27
25
30

A Weighted Network Graph is given below:



CLO-4
Level-4

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]