



Daffodil International University
Faculty of Science & Information Technology
Department of Computer Science & Engineering
Midterm Examination, Fall 2025
Course Code: CSE123, Course Title: Data Structure
Level: 1 Term: 3 Batch: 68

Marks: 25

Time: 01:30 Hrs

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	You are developing a Student Record Management System for a university. The system needs to maintain student data dynamically as students are added or removed during registration. Each student record contains the following details: • Roll No (integer) • Name (character array/string) • CGPA (float) To efficiently manage insertions and deletions from both ends and anywhere in the list, you decide to use a Linked List where each node represents a student record. Design and draw the structure of the Linked List with proper visualization of nodes representing three students (Roll No, Name, CGPA) and connect them based on their Roll No in ascending order.	[3]	CO1
2	a) Write a C program to implement the above (Q1) linked list and print all the information from backend of the linked list. b) Write a C program to insert a new student record (Roll No: 101, Name: Maruf, CGPA: 3.56) at the beginning of the linked list (from Q1). c) Write a C program to delete the last student record from the linked list using function (from Q1).	[4] [4] [4]	CO2
3	A software company is developing a Mathematical Expression Evaluator as part of a calculator application. Users will input arithmetic expressions in standard infix notation. However, the internal processing unit of the calculator can only evaluate expressions in postfix form (also known as Reverse Polish Notation), because postfix eliminates the need for parentheses and operator precedence handling during computation. To perform this conversion, the software team decides to use a Stack-based approach to manage operators and parentheses efficiently. Expression: $(1 + 2) ^ 3 * (4 + 5) - 9 / (4 - 1)$		CO2
	a) Convert the above expression into postfix using stack.	[3]	
	b) After converting the postfix expression evaluate the expression using stack.	[2]	

4	You are asked to design a Customer Service Request Management System for a large telecom company. The system handles two major tasks: 1. Incoming customer requests (complaints or service queries). 2. Processing and resolving those requests efficiently. Each request arrives with a timestamp and priority. Sometimes, requests need to be handled in the same order they arrive, while in other cases (like urgent issues), the most recent unresolved request must be handled first. The company also wants the system to allow viewing the most recently resolved request quickly for quality verification. Based on the above scenario, identify which data structure would be most suitable for implementing the system. Then, 1. Draw a flowchart or conceptual diagram to represent how the system will handle and process requests. 2. Describe the process clearly, including how requests are received, processed, and stored after resolution.	[2+3]	CO1
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