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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

Time: 01:30 Hrs **Marks: 25**

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.	[4]	CO2
	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).	[4]	
	c)	Write a C program to delete the last student record from the linked list using function (from Q1).	[4]	
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]	

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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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