



Daffodil International University
Faculty of Science & Information Technology
Department of Computer Science & Engineering
Midterm Examination, Spring 2026
Course Code: CSE123, Course Title: Data Structure
Level: 1 Term: 3 Batch: 69

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	Start Linked List Clear	CO2
a)	Implement a C program using structure, pointers and dynamic memory allocation to create the above linked list (use your <u>nickname</u> as the common node name). Then, display all the information stored in the linked list.	[4]
b)	Write a C program to insert a new record (Q: 'D', R: 10) after the node having data part (Q = 'B') using function.	[4]
c)	Apply the knowledge of dynamic memory allocation, pointer, structure and write a C program to delete the node having data part (R = 5) from the linked list using function.	[4]
2	A code syntax analyzer is being developed for a programming editor. Before compiling a program, the editor must ensure that all operators and operands are processed in the correct order. The analyzer internally converts expressions into a format that can be evaluated sequentially without considering operator precedence or brackets. To manage operators during conversion, the system uses a stack-based mechanism. Expression: $- * ^ + 1 2 3 + 4 5 / 9 - 4 1$	CO1
a)	Demonstrate the process of converting the above expression into infix notation.	[2]
b)	Apply stack operations to convert the resulting infix expression into postfix notation.	[3]

3	A Hospital Patient Management System is being developed to manage patient services efficiently. The system must support the following operations: 1. Patients register at the reception desk and are normally treated in the order of arrival. ✓ 2. Emergency patients must be treated before regular patients, regardless of arrival time. ✓ 3. Each patient is assigned a priority level based on medical condition. 4. The system should allow hospital staff to view the next patient to be treated at any time. Based on the above requirements: i. Identify the most appropriate data structure(s) to implement this system and explain your choice. ii. Draw a conceptual diagram or flowchart showing how patients are: • Registered • Prioritized • Sent for treatment	[2+3]	CO1								
4	Match each real-life scenario with the most suitable data structure and also briefly explain your answer. <table border="1"><thead><tr><th>Scenario</th><th>Data Structure</th></tr></thead><tbody><tr><td>Redo operation in a photo editing software</td><td>?</td></tr><tr><td>Customers waiting in a bank service line</td><td>?</td></tr><tr><td>Recently visited pages in a web browser</td><td>?</td></tr></tbody></table>	Scenario	Data Structure	Redo operation in a photo editing software	?	Customers waiting in a bank service line	?	Recently visited pages in a web browser	?	[3]	CO1
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$(1+2)^3 \times (4+5) - 9/4-11$
 $12+395 \times \times \wedge 991 -1-$