Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science and Engineering

Midterm Examination, Fall 2024

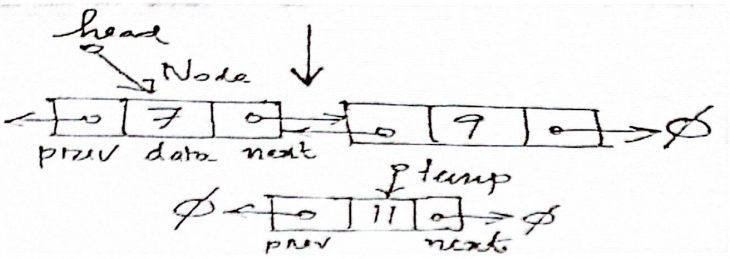
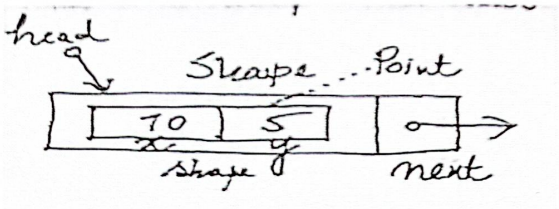
Course Code: CSE123, Course Title: Data Structures

Level:1 Term:2 Batch: ALL

Time: 1.5 Hours **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.	Consider the following figure of a doubly link list:  The *Node* shown above has *data* of type integer and *prev* and *next* as pointer of the same type. Answer the following questions:		
	(A) Define the node and write the required code to implement the scheme shown above.	4	CO2
	(B) Suppose the 'temp' node having data 11 is to be inserted after the node having "7". Draw the connection scheme for the new node and write the required code to insert it into the doubly link list shown.	4	CO2
	(C) Suppose you need to delete the node having data 11. Show the required deletion code.	3	CO2
	(D) Why is a doubly link list preferred over a single link list?	2	CO1
2.	Consider the following figure of two link list *lst1* and *lst2*:  Write the required code using C language to define the Shape node.	5	CO2
3.	(a) Consider the following infix expressions: (i) 3^2 + 6/3 – 3 x 2 (ii) 6 / 3 + 2 x 3 - 4 Convert the above infix expressions into prefix and postfix expressions. Also shows the conversion of expression (i) into postfix using Stack. During the process demonstrate each of the stack content.	5	CO2
	(b) Why stack is widely used in computing.	2	CO2