



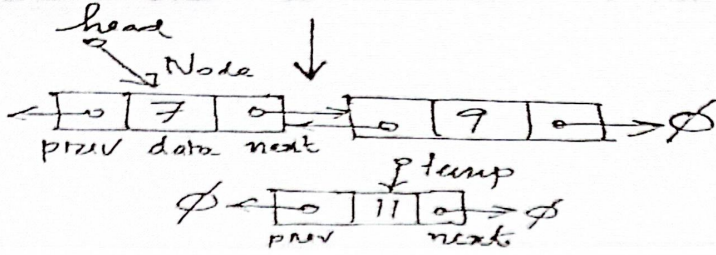
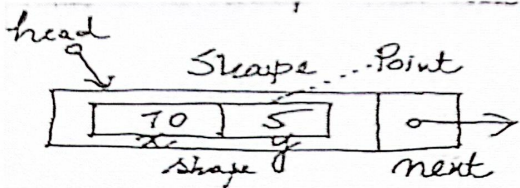
Daffodil International University
Faculty of Science & Information Technology
Department of Computer Science and Engineering
Midterm Examination, Fall 2024
Course Code: CSE123, Course Title: Data Structures
Level:1 Term:2 Batch: ALL

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.]

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| 1. | <p>Consider the following figure of a doubly link list:</p>  <p>The Node shown above has <i>data</i> of type integer and <i>prev</i> and <i>next</i> as pointer of the same type.</p> <p><u>Answer the following questions:</u></p> <p>(A) Define the node and write the required code to implement the scheme shown above. 4 CO2</p> <p>(B) Suppose the 'temp' node having data 11 is to be <u>inserted after the node having "7"</u>. Draw the connection scheme for the new node and <u>write the required code</u> to insert it into the doubly link list shown. 4 CO2</p> <p>(C) Suppose you need to delete the node having data 11. Show the required <u>deletion</u> code. 3 CO2</p> <p>(D) Why is a doubly link list preferred over a single link list? 2 CO1</p> | | |
| 2. | <p>Consider the following figure of two link list <i>lst1</i> and <i>lst2</i>:</p>  <p>Write the required code using C language to define the Shape node.</p> | 5 | CO2 |
| 3. | <p>(a) Consider the following infix expressions:</p> <p>(i) $3^2 + 6/3 - 3 \times 2$</p> <p>(ii) $6 / 3 + 2 \times 3 - 4$</p> <p>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.</p> | 5 | CO2 |
| | <p>(b) Why stack is widely used in computing.</p> | 2 | CO2 |