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Reg. No……
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2022

DATA STRUCTURES

[Maximum Marks: **100**] [Time: **3** Hours]

PART-A

I. (Answer ***all*** questions in one or two sentences. Each question carries ***2*** marks)

1. Write Postfix notation for the expression A+B*(C-D)/E*(F-G).
2. List the operations that can be performed on a double ended queues.
3. Describe a circular linked list.
4. Describe the Expression trees.
5. Write any two methods for representing a graphs. (5 x 2 = 10)

PART-B

II. (Answer ***any five*** of the following questions. Each question carries ***6*** marks)

1. Explain commonly used asymptotic notations for calculating time complexity of an algorithm.
2. Write an algorithm for evaluating a postfix expression.
3. Write the procedure for insert and delete tail node of a singular linked list.
4. Explain different tree traversal methods.
5. Explain expression tree and threaded binary tree with example.
6. Write an algorithm for binary search.
7. Write Warshall's algorithm for All Pair Shortest Path problem. (5 x 6 = 30)

PART-C

(Answer ***one*** full question from each Unit. Each full question carries **15** marks)

UNIT – I

III. (a) Write an algorithm for converting an Infix expression to Postfix. (9)

(b) Write a program for implementing a stack ADT using array. (6)

OR

IV. (a) Write an algorithm for implementing a queue ADT using array. (9)

(b) Write note on circular queue and double ended queue. (6)

UNIT – II

V. Write a program for implementing Linked list ADT. (15)

OR

VI. Write a program for implementation of Stack using Linked list ADT. (15)

UNIT- III

VII. Write a program for tree traversal using BST. (15)

OR

VIII. (a) Describe binary tree? How strictly binary tree differ from complete binary tree? (6)

(b) Explain tree terminologies – Child, Degree, Depth, Edge, Height, Leaf, Level, Path and Siblings. (9)

UNIT - IV

IX. Explain different graph traversal algorithms with example (15)

OR

X. (a) Explain Quick sort algorithm with example. (11)

(b) Explain Bubble sort algorithm. (4)

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