Progressive Education Society's

Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16, NEP 2020 (Autonomous)

End Semester Examination: April/May 2024

***Total No. of Questions**: 5/33* ***Total No. of Pages**: 2*

First Year (Class Name)
COM12101: Data Structures Using 'C'
(Semester II)

Program: B.Sc. Computer Science (BSc Comp05)
Credits: 4
Program Specific: Computer Science **Time:** 3 Hours
Course Type: Mandatory **Max. Marks:** 60
Paper: I

Instructions to the candidate:

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Draw a well labeled diagram wherever necessary.*

SECTION: A

Q1) Answer the following: **[1 X 10 =10]**

1. Define Stack.
2. List any two types of Link List.
3. Convert the given infix expression into postfix A-B/C.
4. List any four types of Data Structure.
5. Write any one use of Graph.
6. Define ADT.
7. Name the data structure which is used in backtracking.
8. Define Binary Tree.
9. Write any two applications of data structure.
10. Define Non-Linear Data Structure.

SECTION: B

Q2) Answer ANY FIVE of the following: **[5 X 2 = 10]**

1. Explain Time Complexity in brief.
2. List any four types of sorting.
3. Evaluate the following postfix expression into infix and calculate it.
   2 3 2 4 * + *
4. State any two applications of Queue.
5. Define Doubly Link List with suitable diagram.
6. List Graph Traversal Methods.
7. Describe Balance Factor.

P.T.O.

SECTION: C

Q3) Answer ANY FIVE of the following: **[5 X 3 = 15]**

1. Differentiate between Linear Search and Binary Search.
2. Write the applications of Stack in brief.
3. Define the following terms.
   i) Binary Search Tree ii) Skewed Binary Tree iii) Leaf Node
4. Write an algorithm of push and pop operations on stack.
5. Write a function to search a particular element using linear search.
6. Explain priority queue in brief.
7. Distinguish between Singly and Doubly Link List.

SECTION: D

Q4) Answer ANY THREE of the following: **[3 X 5 = 15]**

1. Explain in place sorting with suitable example.
2. Write a function to insert elements in a Single Link List.
3. List the types of queue and explain any two with suitable example.
4. Construct the AVL Tree for the following data.
   Chaitra, Magh, Vaishakh, Kartik, Falgun, Aashadh, Shravan,Bhadrapad
5. Trace the following elements using Bubble Sort.

   34, 87, 26,12,5

SECTION: E

Q5) Answer ANY TWO of the following: **[2 X 5 = 10]**

1. Convert the following infix expression into postfix using Stack.
   (A+B)*(C+D)
2. Explain Tree traversal methods with suitable example.
3. Explain merge sort with suitable example.
4. Differentiate between Stack and Queue.

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