S.Y.B.Sc. (Computer Science)

SEMESTER-III Examination

USCS-231 Data Structures using C

Time: 2:00 Hours] **[Marks: 35**

Instructions to the candidates:

1. All questions are compulsory.
2. Draw neat labelled diagram wherever necessary
3. Figure to the right indicate full marks

Q.1 Solve any **FIVE** of the following. **[5]**

a) Define an Algorithm.

b) What is an array?

c) Write the types of Linked List.

d) What is Stack?

e) Define queue.

f) What is Binary Search tree?

Q.2 A] Solve any **TWO** of the following. **[6]**

a) Explain the difference between Array and Linked List.

b) What is Tree? Explain Strictly Binary Tree and Complete Binary Tree.

c) What is circular queue? What are the problems associated with Linear Queue.

B] Solve any **TWO** of the following. **[4]**

a) Explain any two operation that can be performed on a queue.

b) What steps are carried out for creating a node for Single Linked List? Explain with code snippet.

c) Explain any one type of binary tree traversals with algorithm.

Q.3 A] Solve any **TWO** of the following. **[6]**

a) Explain Count Sort with a suitable example.

b) Explain Big O Notation with any sorting algorithm example.

c) Explain the three basic operations associated with stack.

B] Solve any **TWO** of the following. **[4]**

a) Write a function to sort integer array using Bubble sort.

b) Write the function to check whether queue is full or empty.

c) Write function to compute length of singly linked List.

Q.4 Solve any **TWO** of the following. **[10]**

a) What is Postfix Expression? Write an Algorithm to convert from infix expression (A+B) * (C/D) to postfix expression.

b) Explain following Tree Terminologies with an Example.
Root Node, Child Node, Siblings, Leaf Node, Level

c) Define doubly linked list. Write a function for insertion and deletion of an element at any position in doubly linked List.

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