(i) Printed Pages : 3 Roll No. .....

(ii) Questions : 9 Sub. Code : 0 9 3 2

Exam. Code : 0 0 2 9

Bachelor of Computer Applications 3rd Semester

1128

DATA STRUCTURES

Paper–BCA-16-305

Time Allowed : Three Hours] **[Maximum Marks :65**

Note :– Attempt **five** questions in all by selecting **one** question from each section. Entire question number **9** is compulsory.

SECTION—A

1. (a) What do you mean by Data Structure? Describe applications of Data Structure.

   (b) What is an Array ? Describe its types. How are two dimensional arrays stored in memory ? 7,6

2. (a) Write algorithms to insert and delete elements in a Linear Array.

   (b) What is a Stack ? Name and describe the operations that can be performed on a stack. 7,6

SECTION—B

3. (a) What is Linked List ? Write an algorithm to insert a node in a Linked List

(b) Write an algorithm to search an element from an unsorted Linked List. 7,6

4. (a) Write an algorithm to traverse elements of a Linked List.

(b) What is Circular Linked List ? Describe its representation in memory. 7,6

SECTION—C

5. (a) How is a Tree represented in continuous storage ? Explain any traversal technique for a Binary Tree. Give examples.

(b) What is Binary Tree ? Write algorithm to insert an element in a Binary Tree. 7,6

6. (a) How is a Graph represented in memory ? Explain with the help of any suitable example.

(b) Differentiate between DFS and BFS. Also explain them. 7,6

SECTION—D

7. (a) What is Binary Search ? Write all stages of searching item 156 in the data list : 78, 80, 91, 100, 123, 156, 178, 220, 230.

(b) How does Merge Sort work ? Give example. 7,6

8. (a) Explain Selection Sort. Illustrate it with a suitable example.

(b) Write an algorithm to Sort elements : 20, 15, 56, 16, 71, 45, 23 using Bubble Sort. 7,6

(Compulsory Question)

9. Write short answers :

(i) What is complexity ?

(ii) Describe Queue.

(iii) Write disadvantages of Linear Search.

(iv) How do you represent a polynomial expression using Linked List ?

(v) Differentiate between simple linked list and doubly linked list.

(vi) Explain complexity of Binary Search algorithm.

(vii) Name any two algorithms which work on Divide and Conquer Principle. $(6\times2)+1$