(i) Printed Pages : 2 Roll No. .....

(ii) Questions : 9 Sub. Code : 0 8 8 3

Exam. Code : 0 0 2 1

B.C.A. 3rd Semester

1125

DATA STRUCTURES

Paper—BCA-302

Time Allowed : Three Hours] **[Maximum Marks : 90**

Note :— Attempt **six** questions in all. Attempt **one** question from each section and the entire compulsory question.

SECTION—A

1. (a) Define data structures. Explain its various operations. Also explain its applications. 2+3+2

   (b) Define and explain stacks and queues along with their memory representation. 4+4

2. (a) Define array. Why are they called basic data structures ? Explain its various operations. 2+2+4

   (b) Define complexity. How is it measured ? Explain various notations along with examples. 1+1+5

SECTION—B

3. (a) What is linked-list ? How insertion, deletion is carried out on them ? Explain with example through algorithm. 1+3+3

   (b) How polynomial is manipulated using linked lists ? 8

4. (a) Define Header Linked Lists, Circular Linked Lists and Doubly linked lists. Also explain the applications of Linked Lists. 2+2+2+2

(b) How searching is performed on linked list ? Write a C-Program for the same. 2+5

SECTION—C

5. (a) Why Trees are used ? How are they stored in memory ? Explain AVL Trees with example. 2+2+4

(b) How insertion and deletion is carried-out on Binary Trees ? Explain. 3.5+3.5

6. (a) Define Binary Trees. How searching is carried-out on them ? Write C code implementation for searching an item or node. 2+2+4

(b) Write a note on Binary search trees. 7

SECTION—D

7. (a) What is the difference between Linear and Binary search ? Explain through C-implementation. 4+4

(b) Compare Insertion sort and Selection sort with example. 3.5+3.5

8. (a) Draw comparison of any two searching techniques. 7

(b) Explain why quick sort is best ? Explain its C-implementation. 2+6

(Compulsory Question)

9. (a) Any one complexity of Notation. 2

(b) Any two operations on doubly linked lists. 2

(c) Traversal of Binary tree. 2

(d) Write a procedure to perform shell-sort. 2

(e) Draw difference between Binary Search Tree and Binary Tree. 2

(f) How linked lists are represented in memory ? 2

(g) Write algorithm for radix-sort function. 2

(h) What is the complexity of Binary Tree Traversal ? 1