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

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

Exam. Code : 0 0 2 9

Bachelor of Computer Applications 3rd Semester

(2122)

DATA STRUCTURES

Paper—BCA-16-305

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

Note :— (1) Attempt **ONE** question from each unit.

(2) Question No. **9** is compulsory question.

(3) All questions carry equal marks unless specified.

UNIT—A

1. (a) How multidimensional arrays are represented in memory ? 6

(b) Write and analyze recursive algorithm to find the factorial of a number. 7

2. Explain Quick sort algorithm as an application of stack. 13

UNIT—B

3. Write an algorithm to find the number NUM of non-zero elements in a linked list. 13

4. (a) What is priority queue ? Explain one-way list representation of priority queue. 7

(b) Write various applications of queue in detail. 6

UNIT—C

5. (a) How trees are represented in memory ? 5

   (b) Explain in-order and post-order traversal technique in detail. 8

6. (a) Write an algorithm to insert and search from a binary search tree. 7

   (b) Explain various traversal techniques for Graphs. 6

UNIT—D

7. (a) What is Binary Search ? How is it different from Linear Search ? 6

   (b) How does Selection sort work ? Write its algorithm with a suitable example. 7

8. (a) What is Insertion sort ? Write its algorithm and explain with suitable example. 7

   (b) Write an algorithm for Merge Sort. 6

(Compulsory Question)

9. (i) Discuss various applications of Data Structure. 2

   (ii) Differentiate between linear and non-linear data structures. 2

   (iii) What are the advantages of linked list over arrays ? 2

   (iv) Define garbage collection. 1

   (v) Differentiate between Binary tree and Binary Search tree. 2

   (vi) Calculate the complexity of Binary search algorithm. 2

   (vii) Which sorting technique is best in terms of complexity ? Justify. 2