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Roll No. ... .

PAPER ID—14532

B.C.A. EXAMINATION, 2023

(Third Semester)

DATA STRUCTURES-I

Code : BCA-202

Time : 3 Hours *Maximum Marks : 80*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

1. (a) Define Binary Search Tree.
   (b) What is De-queue ?
   (c) Define priority queue.
   (d) Can *you* apply binary search method on *sorted* linked list ?
   (e) What is the complexity of quick sort ?
   (f) Define post order traversal.
   (g) What do you mean by PUSH and POP ?
   (h) Explain any *two* operations on strings. 2×8= 16

Unit I

2. (a) What do you mean by the complexity of an algorithm ? Define Big O Notation. 8

   (b) Define String. Explain any *five* operations on strings with an example. 8

3. (a) Explain the categories of data structures. 8

   (b) Define Fibonacci sequence. Write a procedure to calculate the *n*th term of the sequence and return it. 8

Unit II

4. What is 2D Array ? How will you declare a 2D array. Explain the procedure of traverse values in 2D array with program. **16**

5. Define a Linked List. Explain different types of linked list and also mention the advantages of linked list. **16**

Unit III

6. Write an algorithm and corresponding C program to insert elements into a queue implemented using an array. **4×4=16**

7. Define PUSH and POP operations of Stack with algorithm. **16**

Unit IV

8. Write an algorithm to traverse a Binary tree T in post order and find the total number of node of T. **16**

9. (a) Explain adjacency matrix and adjacency list with suitable examples. **8**

(a) Write Depth first search algorithm to traverse graph. **8**