TDC (CBCS) Odd Semester Exam., 2022

COMPUTER APPLICATION

(3rd Semester)

Course No. : BCACC–301T

(Data Structure)

Full Marks : 50

Pass Marks : 20

Time : 3 hours

The figures in the margin indicate full marks for the questions

UNIT—I

1. Answer any *two* of the following questions : 2×2=4

(a) What is multidimensional array? How are multidimensional arrays represented in memory?

(b) Write down the procedure to traverse a linear array.

(c) Consider the linear arrays AAA (5 : 50), BBB (–5 : 10) and CCC (18). Find the number of elements in each array.

2. Answer any *one* of the following questions : 6

(a) *(i)* Write the algorithm for PUSH and POP operation of a stack. 4

(ii) Evaluate the following post-fix expression : 2

12, 7, 3, –, 1, 2, 1, 5, +, *, +

(b) Write short notes on the following : 3+3=6

(i) Row major and column major order of 2D array

(ii) Linked representation of sparse matrix

UNIT—II

3. Answer any *two* of the following questions : 2×2=4

(a) What do you mean by input restricted and output restricted deque? Give example.

(b) Write down the applications of priority queues.

(c) Define doubly linked list with example.

4. Answer any *one* of the following questions : 6

(a) What are the different operations that can be performed on deque? Explain with algorithm.

(b) Write an algorithm to insert and delete an element in a circular linked list. 3+3=6

UNIT—III

5. Answer any *two* of the following questions : 2×2=4

(a) Write the limitations of recursion.

(b) Mention the advantages and disadvantages of threaded binary tree.

(c) What is complete binary tree? Give example.

6. Answer any *one* of the following questions : 6

(a) Explain the algorithm of preorder, inorder and postorder traversal of a binary tree. 2+2+2=6

(b) Write down the step-by-step procedure to construct the AVL tree for the following data :

21, 26, 30, 9, 4, 14, 28, 18, 15, 10, 2, 3, 7

UNIT—IV

7. Answer any *two* of the following questions : 2×2=4

(a) Write down the difference between searching and sorting algorithms.

(b) What do you mean by best case and worst case time complexity of an algorithm?

(c) Write down the drawbacks of selection sort.

8. Answer any *one* of the following questions : 6

(a) Write the algorithm for binary search. Let Data be the following sorted 10-element array :

Data :

11, 22, 30, 33, 40, 44,
55, 60, 66, 77

Apply the binary search technique to search elements 44 and 68. 3+3=6

(b) Explain shell sort algorithm with suitable example.

UNIT—V

9. Answer any *two* of the following questions : 2×2=4

(a) Define folding method with example.

(b) What is chaining?

(c) What is double hashing?

10. Answer any *one* of the following questions : 6

(a) Consider a hash table of size 10, using linear probing, insert the keys 72, 27, 36, 24, 63, 81 and 92.

(b) Define the following : 2+2+2=6

(i) Linear probing

(ii) Quadratic probing

(iii) Rehashing

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