TDC (CBCS) Odd Semester Exam., 2022

B.VOC (Information Technology)

(3rd Semester)

Course No. : BVOCGE-302T

(Data Structure)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. *(a)* What is data structure? Why is data structure required? 2+5=7

   (b) Show the classification of data structure with diagram. Write the advantages of data structure. 3+4=7

2. *(a)* Define array. How is array represented in computer memory? 2+6=8

(b) Write short notes on the following : 3×2=6

(i) Multidimensional array

(ii) Sparse array

UNIT—II

3. (a) What is queue? What are the features and applications of queue? 2+6=8

(b) How is a queue implemented? 6

4. (a) Define the following with example : 2×3=6

(i) Infix notation

(ii) Prefix notation

(iii) Postfix notation

(b) Transform an arithmetic infix expression

$$Q:((A+B)*(C-D)+E)/(F+G)$$

into its equivalent postfix expression. 8

UNIT—III

5. Define binary tree. Explain all types of binary tree with example. 2+12=14

6. What is tree traversal in data structure? Explain all types of tree traversal with example. 2+12=14

UNIT—IV

7. (a) Write the algorithm for binary search. 7

(b) Show the steps to search the element 52 from the following elements stored in an array : 7

11, 15, 17, 28, 40, 44, 52, 65

8. (a) What is merge sort? Write an algorithm for merge sort. 1+6=7

(b) Show the steps to sort the following unsorted elements using merge sort algorithm : 7

39 9 81 45 90 27 72 18

UNIT—V

9. (a) Define the following graph terminologies : 1×7=7

(i) Vertex

(ii) Edge

(iii) Directed graph

(iv) Undirected graph

(v) Adjacent edges

(vi) Degree

(vii) Incident

(b) Explain two common ways to represent a graph data structure. 7

10. What is hashing data structure? What are the benefits of hashing? Explain different types of hashing. 3+3+8=14

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