2019/TDC/ODD/SEM/BVOGE–302/238

TDC Odd Semester Exam., November—2019

B. Voc (Information Technology)

(3rd Semester)

Course No. : BVO-GE–302

(Data Structure)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

Answer *any* **one** question from each Unit

UNIT—I

1. *(a)* Define the following :   2+2=4

      (i) Abstract data type

      (ii) Array

   (b) What do you mean by complexity of an
      algorithm?   2

   (c) Briefly discuss the representation of
      one-dimensional array with an example.   8

(2)

2. (a) Define the following : 2×3=6

(i) Big O notation

(ii) Data structure

(iii) Sparse matrix

(b) Discuss about different types of linked list. 8

UNIT—II

3. (a) Define the following : 2+2=4

(i) Queue

(ii) Recursion

(b) What are the different types of queue? 2

(c) Translate the following arithmetic expression into its equivalent postfix expression : 8

$$Q : A + (B * C - (C/E \wedge F) * G * H)$$

4. (a) What are the applications of stack? Discuss briefly. 6

(b) Write an algorithm to implement circular queue. 8

(Continued)

(3)

UNIT—III

5. (a) Define the following : 2+2=4
(i) Binary search tree
(ii) Depth and degree of a tree

(b) How does a tree differ from linear data structure? 2

(c) Explain inorder, preorder and postorder traversal of a tree with an example. 8

6. (a) Discuss threaded binary tree with an example. 8

(b) Draw a binary search tree with the following elements : 6

15, 12, 20, 30, 44, 52, 26, 60

UNIT—IV

7. Write an algorithm for selection sort. Show the steps to sort the following numbers using quick-sort algorithm : 7+7=14
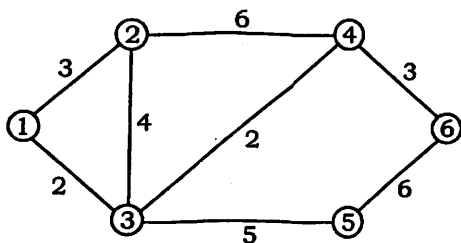
38, 55, 50, 32, 56, 12, 25

8. Write an algorithm for linear search. How does linear search differ from binary search? Show the steps to search the element 50 from the following list : 5+4+5=14

30, 35, 38, 42, 50, 57, 69, 80

(Turn Over)

(**4**)

UNIT—V

9. *(a)* Define the following terminologies : 2×3=6

(i) Vertex

(ii) Adjacency list

(iii) Directed graph

(b) State the benefits of hashing in data structure. 2

(c) Explain different types of hashing methods. 6

10. *(a)* Write an algorithm for depth first search in a graph. 7

(b) Perform depth first and breadth first search for the following graph : 7

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