Faculty of Engineering & Technology
Fourth Semester B.E. (Computer Technology) (C.B.S.)
Examination
DATA STRUCTURE AND PROGRAM DESIGN
Paper—II

Time—Three Hours]   [Maximum Marks—80

INSTRUCTIONS TO CANDIDATES.

(1) All questions carry marks as indicated.

(2) Assume suitable data wherever necessary.

1. (a) Explain different searching techniques for 'n' number of elements with proper example.   8

   (b) Write an algorithm for Insertion sort.   5

OR

2. (a) Write a program to implement Bubble sort.   7

   (b) Explain following terms with proper example :

   (i) Sparse Matrix

   (ii) "Big O" Notation.

   (iii) Recursion.   6

3. (a) Explain the following concept related to stack :

   (i) Applications of stack

   (ii) Operations of stack.   6

(b) Write an algorithm for transforming infix expression into postfix form using stack. 8

OR

4. (a) Write a program to implement various operations on queue using linked list. 8

(b) Write in brief about :

(i) Circular Queue

(ii) Dqueue. 6

5. (a) Explain various types of linked list with proper representation and example. 5

(b) Write a function to :

(i) Insert a node at specific position in singly linked list.

(ii) To search an element from a singly linked list. 8

OR

6. (a) Write a short note on Dynamic Memory Allocation. 5

(b) Write a function to :

(i) Insert a node at end in doubly linked list

(ii) Delete a node from a specific position from doubly linked list. 8

7. Define the following terms and also give examples of each :

   (i) Tree

   (ii) Binary Tree

   (iii) Binary Search Tree

   (iv) Strictly Binary Tree

   (v) Full Binary Tree

   (vi) Complete Binary Tree

   (vii) AVL Tree. 14

OR

8. (a) Draw a expression tree for the following expression :

   (i) (A + B) * C + D/(B + A* C) + D

   (ii) (A/B) * C + D * E – A * C. 8

   (b) Write a non-recursive procedure for in-order traversal of a binary tree. 6

9. (a) Explain any one Minimum Cost Spanning Tree algorithm with suitable example. 6

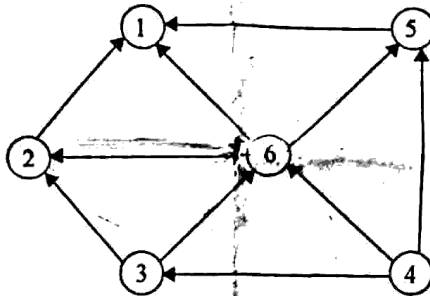   (b) Define the following terms :

   (i) BFS

   (ii) DFS. 8

OR

10. For a graph shown obtain :

    (a) In degree and out degree of each vertex.

    (b) Its Adjancency Matrix

(c) Its Adjacency list

(d) Its strongly connected component.

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11. Write short notes on the following :

    (a) Storage Structure on tapes and disks

    (b) Indexed Sequential file

    (c) Direct Access file

    (d) External Sorting method.   13

OR

12. (a) Discuss fundamental file organization tech. Discuss their merits and demerits.   6

    (b) Write in detail about Hashing Techniques.   7