

313301

25226

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Use of Non-programmable Electronic Pocket Calculator is permissible.
(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : 10
- a) Define data structure. Classify it.
 - b) State any two differences between bubble sort and selection sort.
 - c) List advantages of linked list over arrays.
 - d) Justify - Stack is known as ADT.
 - e) Define circular queue with example.
 - f) List types of binary tree traversal.
 - g) Define the term Heap w.r.t. Tree.

P.T.O.

- 2. Attempt any THREE of the following : 12**
- a) Explain Linear data structure with suitable example.
 - b) List different sorting techniques. Explain any one in detail.
 - c) Write a C program to insert a node in singly linked list at first position.
 - d) Define following terms w.r.t tree.
 - i) Ancestor node
 - ii) In-Degree of node
 - iii) Leaf node
 - iv) Degree of tree
- 3. Attempt any THREE of the following : 12**
- a) Write a program for array to perform Binary search.
 - b) Draw a structure for singly linked list and doubly linked list. State two point of difference between both.
 - c) Explain PUSH and POP operations in stack using array with example.
 - d) Compare linear queue and circular queue. (Minimum four points.)
- 4. Attempt any THREE of the following : 12**
- a) Compare static and dynamic memory allocation. (Minimum four points)
 - b) Convert given infix expression into postfix using stack. Show step-by-step conversion.
$$A \times B / C - D \wedge E$$
 - c) Explain application of queue with example.
 - d) Draw binary tree for given expression. Write preorder and postorder traversal for it.
$$10 / 20 \wedge 30 * 40 \% 50$$
 - e) Compare General tree and Binary tree. (Minimum four points.)

5. Attempt any TWO of the following : 12

- a) Write C program to delete a node from linked list from last position.
- b) Explain any two application of stack in detail with example.
- c) Implement program for insert and delete operation on queue.

6. Attempt any TWO of the following : 12

- a) Sort the given data of array using selection sort.
70, 10, 20, 5, 30
Show each iteration properly.
 - b) Write a C program for inserting a new node at random position in singly linked list.
 - c) Create BST for given data. Write Inorder, preorder and postrder traversal for BST.
80, 60, 90, 10, 50, 20, 120, 150
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