Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER III– • EXAMINATION – SUMMER 2015

Subject Code:130702 **Date:**09/**06/2015**

Subject Name: Data and File structure

Time: 02.30pm-05.00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** **07**

(i) Write algorithm to sum values in vector V and find out the execution time required. **04**

(ii) Explain the equation that finds out the address of the element of the one dimensional array. Assume necessary data. **03**

(b) **07**

(i) Convert the following Polish(prefix) expression to Reverse Polish(suffix) notation **04**

a. ++abc
b. +a+bc
c. +a*bc
d. *a+bc

(ii) Does a time sharing computer use a queue or stack? Explain. **03**

Q.2 **(a)** Write an algorithm for inserting a node and deleting a node in doubly linked linear list. **07**

(b) Write steps of procedure to insert an element to the top of the stack and remove top element from a stack. **07**

OR

(b) What is the advantage of Polish expression over infix notation? Write an algorithm to convert an infix expression into reverse Polish expression. **07**

Q.3 **(a)** **07**

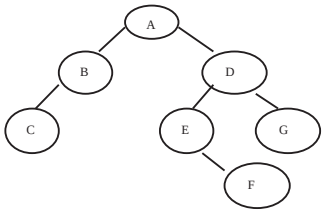
(i) Write a recursive algorithm to find factorial. **04**

(ii) Which type of allocation is called linked allocation? Define singly linked linear list. **03**

(b) **07**

(i) Explain the threaded storage representation for binary trees. **04**

(ii) Define the inorder, postorder and preorder traversal for the following tree. **03**



OR

Q.3 **(a)** **07**

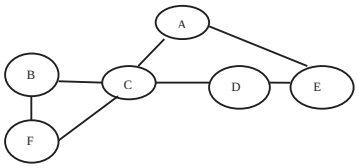
(i) What are the advantages of circular lists over singly linked list? **04**

(ii) Explain – Why doubly linked lists are much more efficient with respect to deletions than singly linked lists? **03**

(b) **07**

(i) Define adjacency matrix. When two digraphs are considered to be equivalent? **04**

(ii) Explain the breadth first search and depth first search tree traversal on the following graph. **03**



Q.4 **(a)** Write an algorithm for inserting and deleting an element from queue. **07**

(b) **07**

(i) Define 2-3 tree. Describe the characteristic of 2-3 tree. **04**

(ii) Write the characteristics of AVL tree. **03**

OR

Q.4 **(a)** What is a circular queue? Write an algorithm for inserting and deleting an element from a circular queue. **07**

(b) **07**

(i) Explain the structure of sequential file. **04**

(ii) Explain the structure of indexed sequential files. **03**

Q.5 **(a)** What is collision? Explain two broad classes of collision resolution techniques. **07**

(b) Explain the binary search method. Write an algorithm for performing a binary search. **07**

OR

Q.5 **(a)** What is hashing? Explain hashing functions. **07**

(b) Explain the multi key file organization and access methods. **07**

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