Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – SUMMER • 2014

Subject Code: 130702 **Date: 04-06-2014**

Subject Name: Data and File Structure

Time: 02.30 pm - 05.00 pm **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)** Answer the following **10**

i) Obtain the expression tree from the following post fix representation ab+cde+**

ii) Define complete binary tree and a full binary tree

iii) List the features of a good hash function

iv) List the uses of stack, queue and linklists

v) What are priority queues? Explain it's uses

(b) Evaluate the following postfix expression using stack **04**

AB+CD/*GH*+ ((where A=2,B=4,C=6,D=3,G=8,H=7)

Q.2 **(a)** Write an algorithm to convert infix to postfix expression and explain it with example **07**

(b) Translate the following string into polish notation and trace the content of stack **07**

A - (B / C + (D % E * F) / G) * H

OR

(b) i) Consider a dequeue given below which has LEFT=1, RIGHT=5 **04**

_ A B C D E _ _ _ _ .

Now perform the following operations on the dequeue

1. Add F on the left.
2. Add G on the right.
3. Add H on the right.
4. Delete two alphabets from left
5. Add I on the right

ii) Differentiate peep() and pop() functions **03**

Q.3 **(a)** Write a program in any programming language to concatenate two doubly linked lists. **07**

(b) Write an algorithm to insert a node in an ordered linked list **07**

OR

Q.3 **(a)** Give the preorder and Inorder traversal of the tree given in fig 1. **07**

(b) Given the following traversals create a binary tree from that. Also give the postorder traversal for the same. **07**

preorder = {7,10,4,3,1,2,8,11}

inorder = {4,10,3,1,7,11,8,2}

Q.4 **(a)** Explain DFS and BFS with example **07**

(b) Construct a binary search tree for the following sequence. Also do the inorder and postorder traversal for the same **07**

45,56,39,12,34,78,54,67,10,32,89,81

OR

Q.4 **(a)** What is a spanning tree? Find the minimum spanning tree for the graph shown in fig 2. **07**

(b) Write short notes on (i) Height Balanced Tree. (ii) Indexed-Sequential Files **07**

Q.5 **(a)** What do you mean by Hashing? Explain any FOUR hashing techniques **07**

(b) Define the following terms **07**

i) Node
ii) Sibling
iii) Path
iv) Indegree & outdegree of a vertex
v) Connected graph

OR

Q.5 **(a)** Compare and contrast Prim's and Kruskal's algorithm with the help of an example **07**

(b) Explain AVL tree with the help of an example also show insertion and deletion with the help of an example. **07**

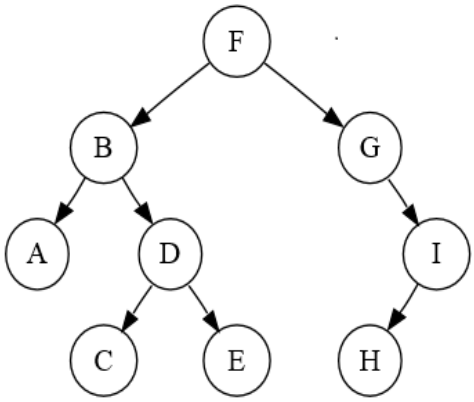

Fig: 1.

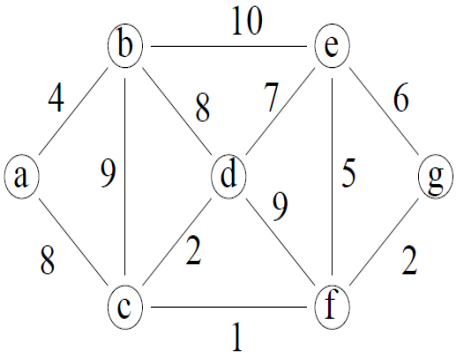

Fig :2

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