

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**
 $AB+CD/*GH*+ ((\text{where } A=2, B=4, C=6, D=3, G=8, H=7))$
- 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

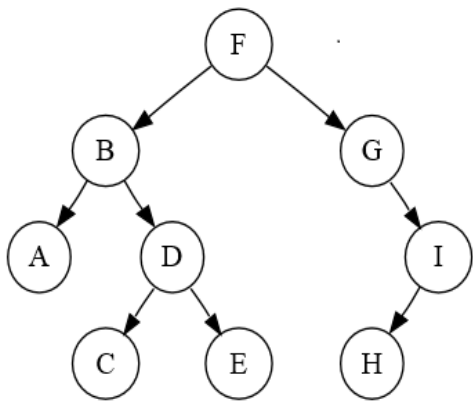


Fig: 1.

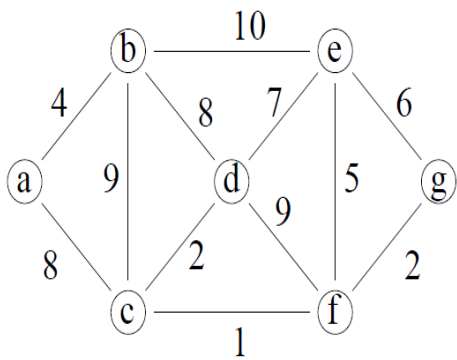


Fig :2
