



- (ix) Select What is the operation of processing each element in the list
- a) Traversal
  - b) Inserting
  - c) Merging
  - d) Sorting
- (x) Choose a binary search tree whose left subtree and right subtree differ in height by at most 1 unit -
- a) AVL tree
  - b) Red-black tree
  - c) Lemma tree
  - d) None of these
- (xi) Select Which of the following algorithm does not divide the list
- a) Linear Search
  - b) Binary Search
  - c) quicksort
  - d) Merge sort
- (xii) The memory address of the first element of an array is defined as
- a) floor address
  - b) foundation address
  - c) first address
  - d) base address
- (xiii) If push(y) and pop(y) are two functions and both the functions return y then show what will return for pop(pop(push(2)))
- a) 2
  - b) 1
  - c) 0
  - d) -1
- (xiv) Select the technique use for Quick sort is
- a) Brute Force technique
  - b) Divide and conquer
  - c) Greedy algorithm
  - d) Dynamic programming
- (xv) Validate the correct statement among the following.
- a) A graph may contain many edges and no vertices.
  - b) A graph must contain at least one vertex.
  - c) A graph may contain no edges and no vertices.
  - d) None of these

### Group-B

(Short Answer Type Questions)

3 x 5=15

2. Judge that a Circular queue is needed to overcome the problem of the linear queue. (3)
3. Explain an algorithm to insert an element at the beginning of a singly linked list (3)
4. Develop an algorithm to implement linear search. (3)
5. Illustrate radix sort on the following numbers: (3)

444,133,115,55,707,90,404,160,399,262,818,466

OR

- Explain AVL Tree with proper example. (3)
6. The inorder & preorder traversal sequence of nodes in a binary tree are given below- (3)

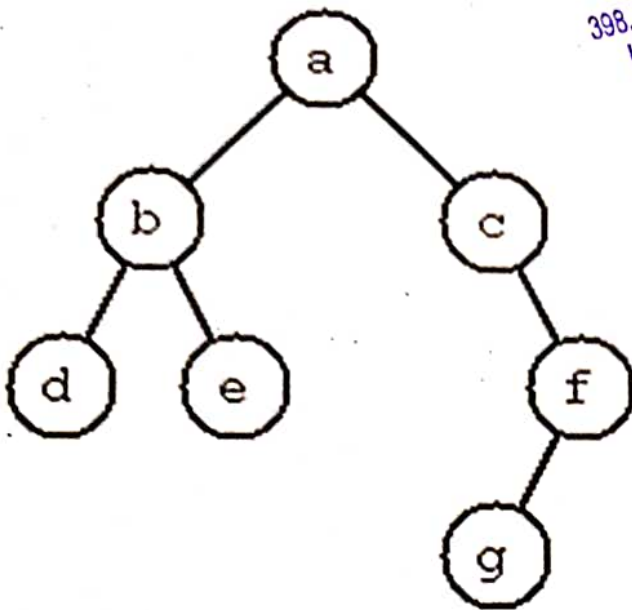
Inorder- E A C K F H D B G

Preorder- F A E K C D H G B

Create the binary tree. State briefly the logic used to construct the tree.

OR

- Design the following tree into memory using array data structure. (3)



**Group-C**

(Long Answer Type Questions)

5 x 6=30

7. Explain the definition of the algorithm and state the basic characteristics of an algorithm (5)
8. Describe an algorithm to physically reverse a singly linked list. (5)
9. Construct the AVL tree for a calendar where nodes are entered in the following order- (5)  
MARCH, MAY, NOVEMBER, AUGUST, APRIL, JANUARY, DECEMBER, JULY, FEBRUARY, JUNE,  
OCTOBER, AND SEPTEMBER.
10. Suppose the following six numbers are inserted in order into an empty binary search (5)  
tree T: 50, 77, 30, 66, 40, 33. Deduce the tree T by describing each step of insertion.
11. Appraise quick sort on the following numbers: 44, 33, 11, 55, 77, 90, 40, 60, 99, 22, 88, (5)  
66
12. Convert the following infix expression into its equivalent postfix expression:  $A * B / D - E$  (5)  
 $+ F$ .

**OR**

Discover the following postfix expression 5, 6, 2, +, \*, 12, 4, /, -. Using Stack. (5)

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