Green University

ASSIGNMENT SHEET

Section : DA-221

Name : Khondokar Saim

ID : 221902353

Lecturer : Md. Abu Rumman Refat

Subject : CSE-105 DS

Date : 15 / 12 / 2022

"Advancing knowledge. Transforming lives"

Ans:-to the Qus:no:1

Write an algorithms to insert or delete an item in an array considering the First in-First out Principle using Queue.

Solution:

Insert / Enqueue Algorithm:

Step-1 : Start

Step-2 : Take the size of array and data to insert as an input from users.

Step-3 : Set front and rear equal to -1.

Step-4 : i) If rear == Size-1 then,
Print Queue is full and go to step 5.

~~Step-5~~ : ii) Else if front = rear = -1 then set
front = 0 ;
rear = 0 ;
and Queue[rear] = data
and go to step 5.

iii) Else rear = rear + 1 and
Queue[rear] = data
and go to step 5.

Step-5 : Print the Queue.

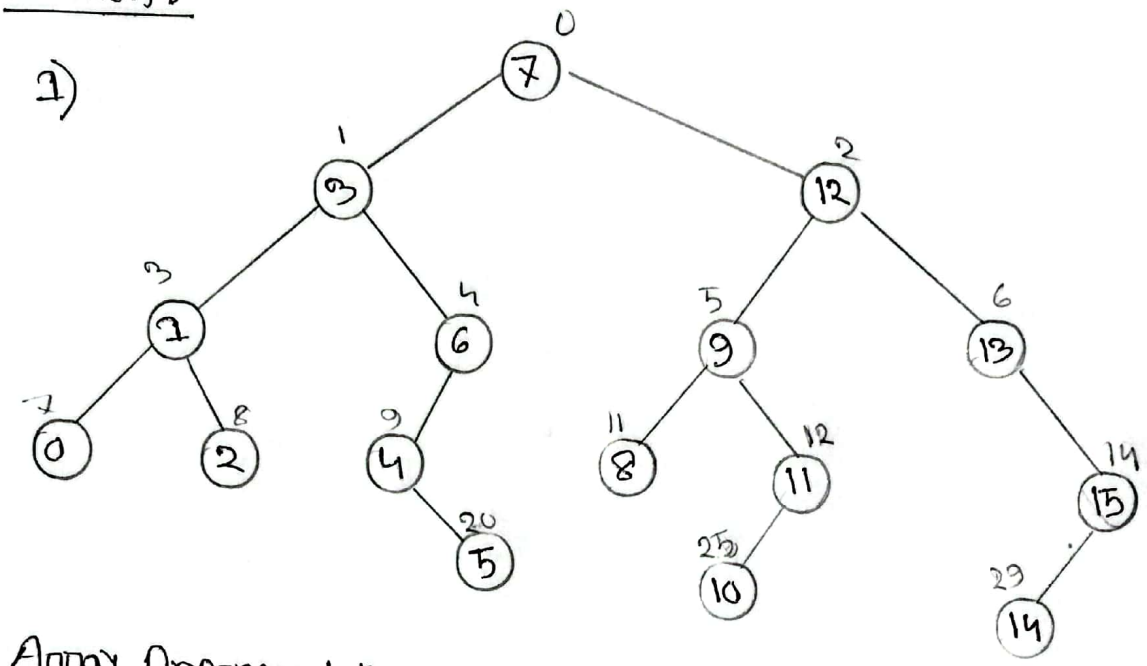
Step-6 : End

Ans. to the Qus : no: 2

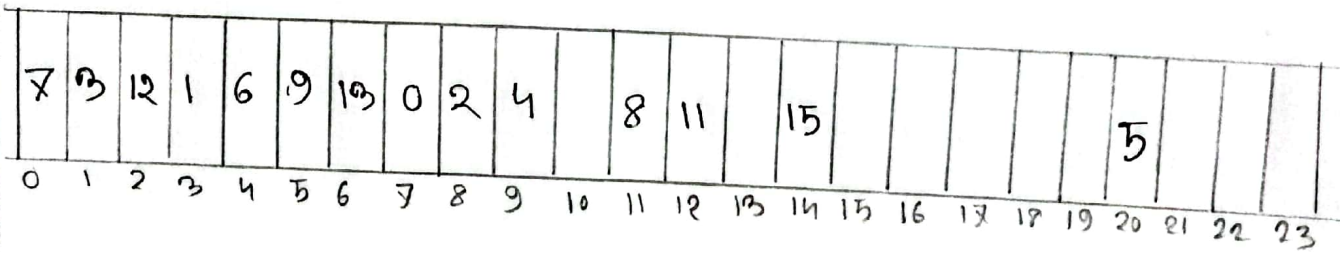
#Illustrate the Array and Linked list representation of the following two given tree

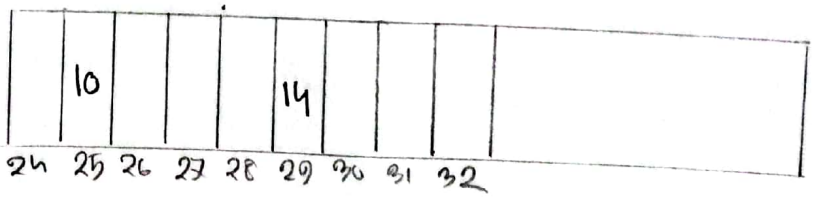
Solution :

1)

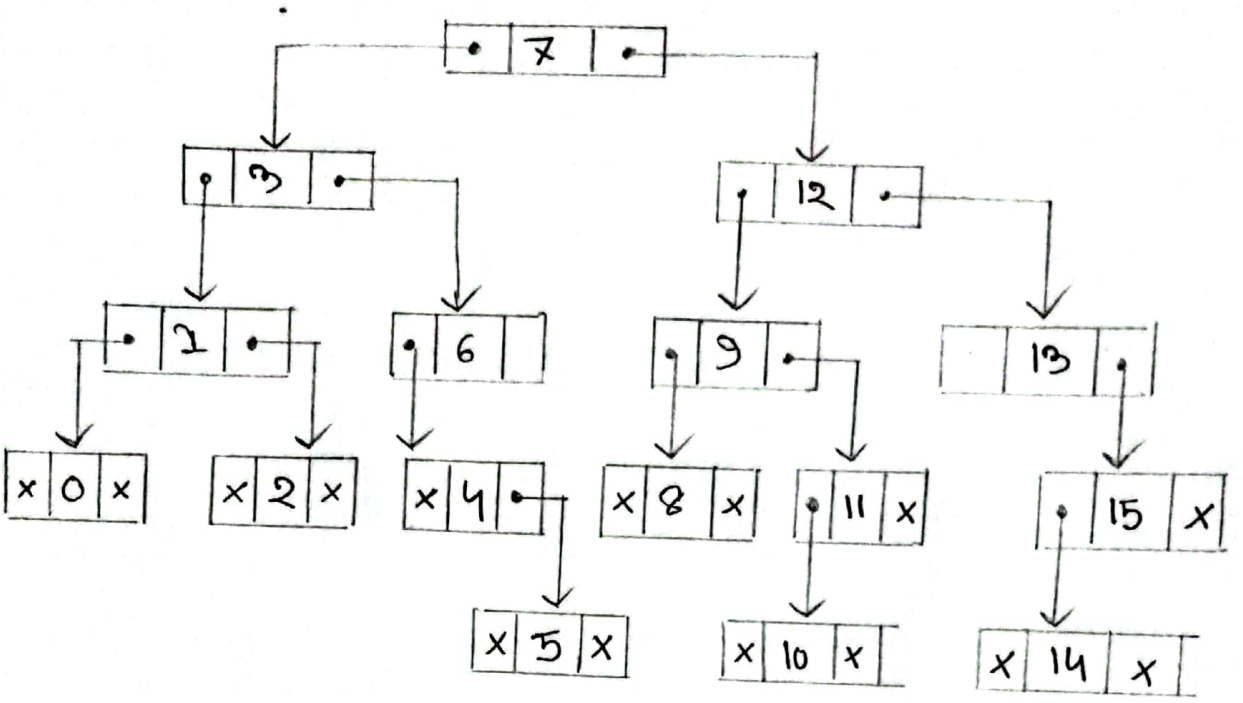


Array Representation :

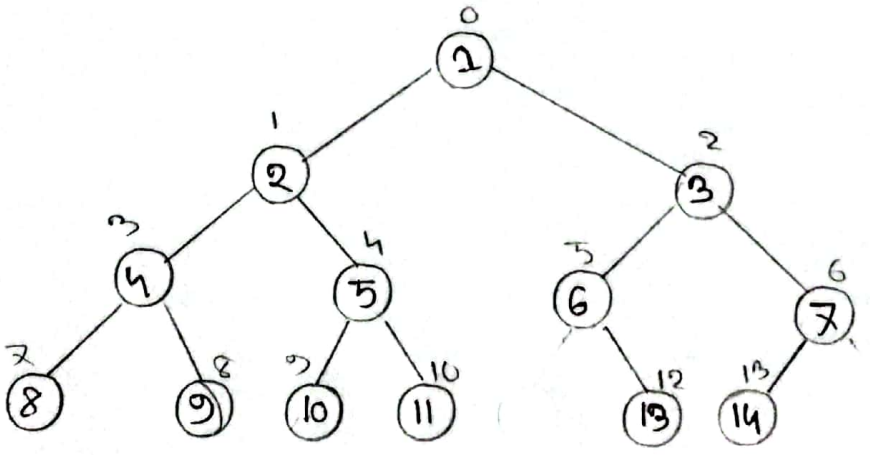




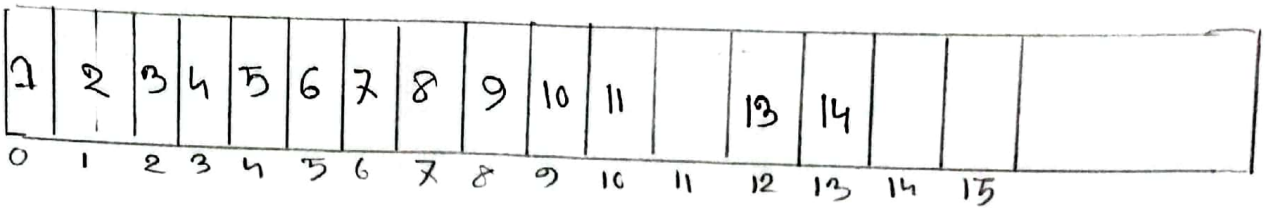
Linked List Representation :



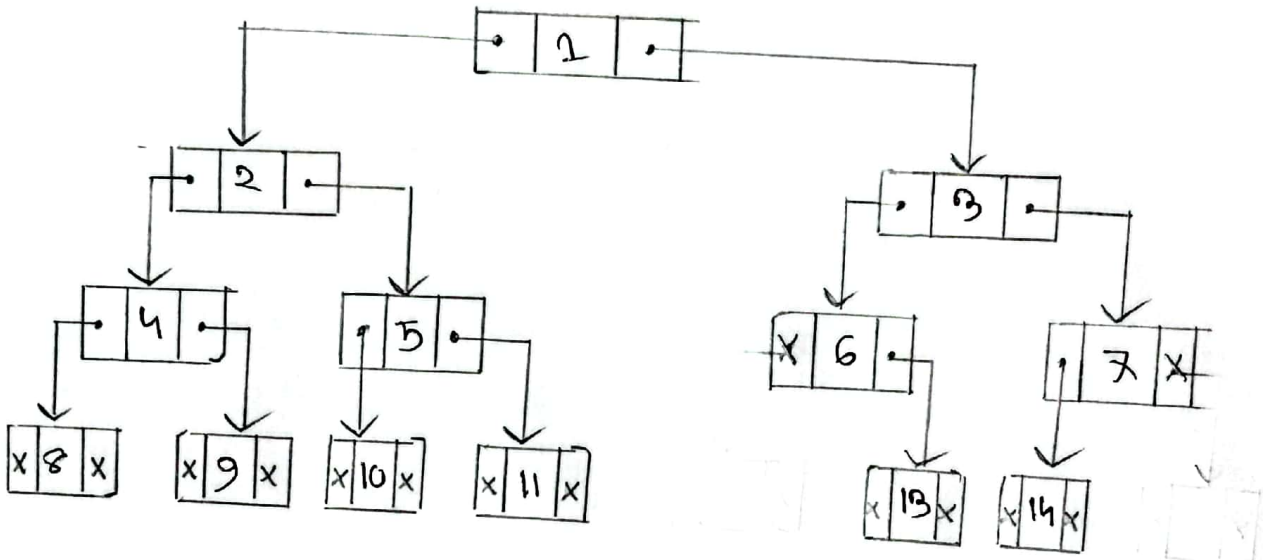
2)



Array Representation :



Linked List Representation :

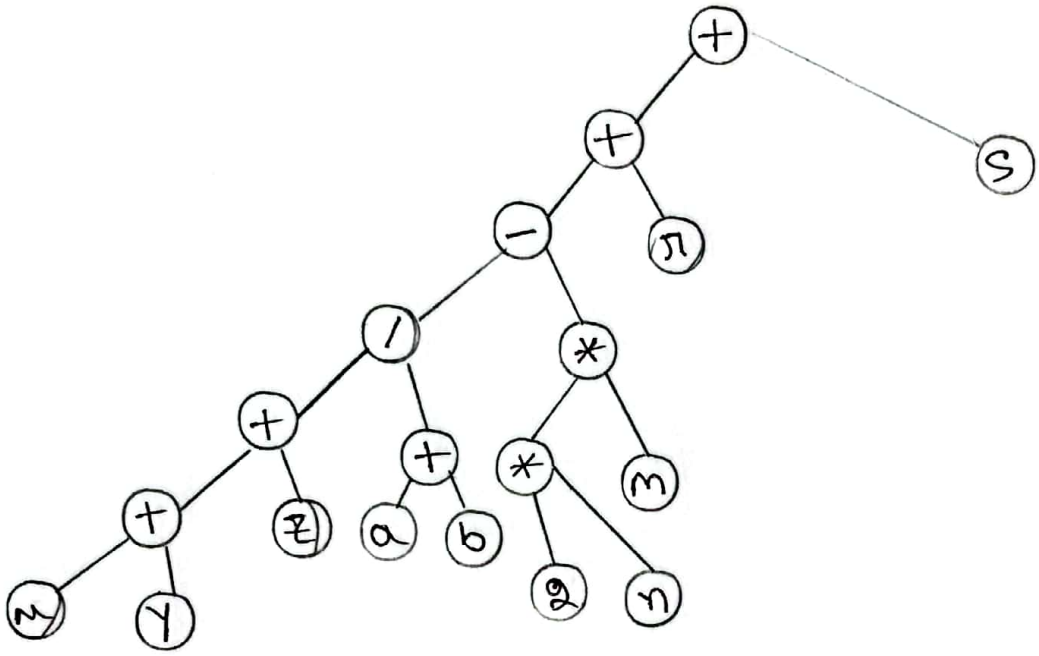


Ans: to the Qus: no: 3

Draw a Binary Tree for the following expression.

$(w+y+z)/(a+b) - g*n*m + \pi + s$

Solution:



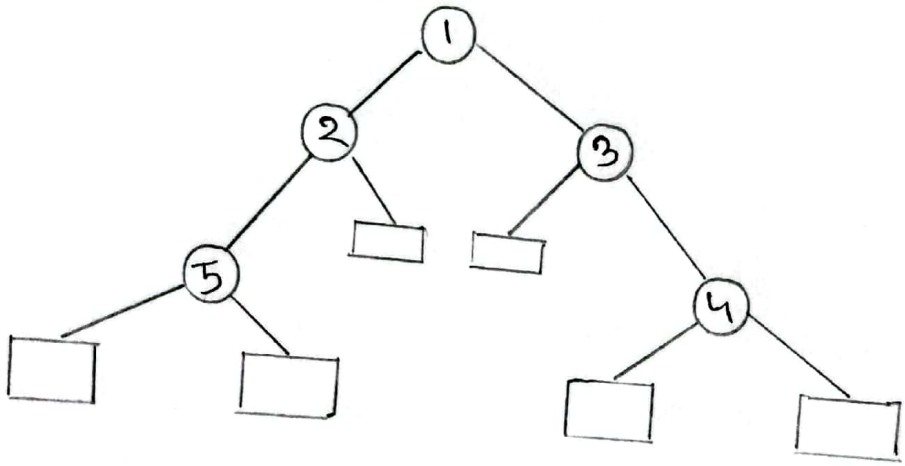
∴ Binary tree

Ans: to the Qus: no: 4

Define the following with Proper diagram

1) Extended Binary Tree:

Extended binary tree is a type of binary tree in which all the null sub-tree of the original tree are replaced with special nodes called external nodes whereas other nodes are called internal nodes.

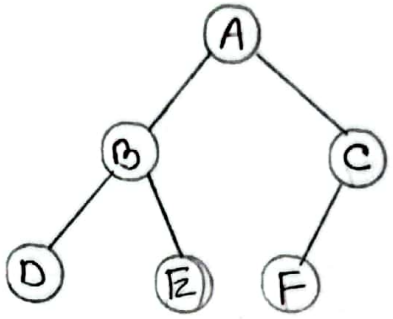


Extended Binary Tree

Here the circles represent the internal nodes and the boxes represent the external nodes.

2) Complete Binary Tree :

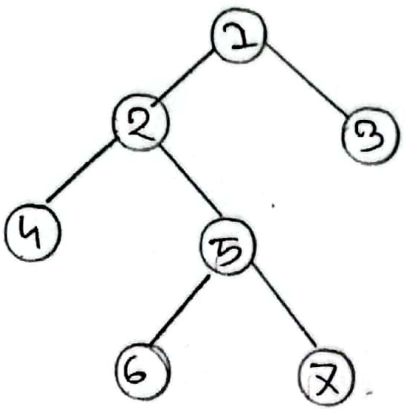
A complete binary tree is a special type of binary tree where all the levels of the tree are filled completely except the lowest level nodes which are filled from as left as possible.



Complete Binary Tree.

3) Full Binary Tree :

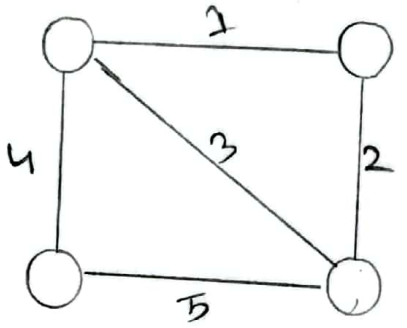
A full binary tree is a special type of binary tree in which every parent node / internal node has either two or no children.



Full Binary Tree.

4) Minimum Spanning Tree :

A minimum spanning tree is a special kind of tree minimizes the lengths (or weights) of the edges of the tree. An example is a cable company wanting to lay line to multiple neighbourhoods by minimizing the amount of cable laid. the cable company will save money.



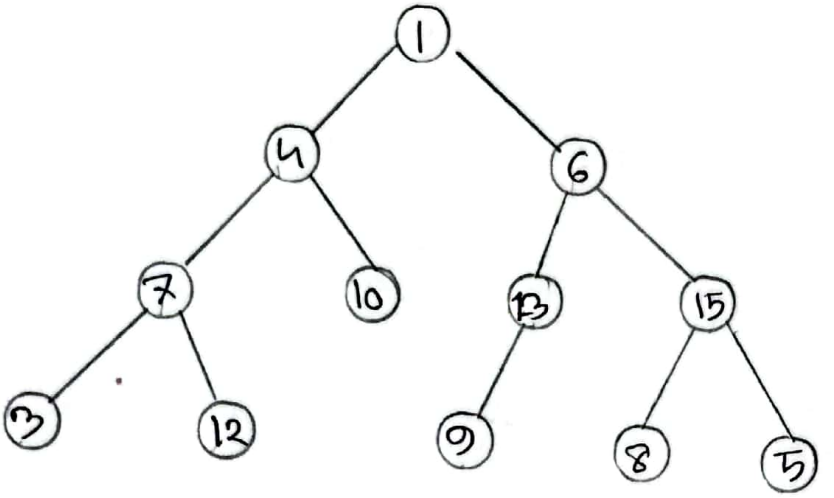
Minimum Spanning Tree

Cost = 7 (= 4+1+2)

5) Binary Search Tree :

A Binary Search-tree is a tree in which all the nodes follow the below-mentioned properties

The value of the left sub-tree is less than the value of its parent (root) node's key.



Binary Search Tree.

Ans: to the Qus: no: 5

With the aid of In-order and Post-order traversal, draw the Binary Tree.

In-order : A + B * C / F H

Post-order : A B C * F H / +

Solution: