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Degree * B.S (software Engr)

Paper * Data structure

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QUESTION - No-1

Sort the given list using Insertion Sort. 56, 59, 45, 40, 43, 55

ANSWER:-

$$n = 6$$

$$\text{Steps} = n - 1 \Rightarrow 6 - 1 = 5$$

Step #1 : Element 59

56, (59), 45, 40, 43, 55

56, 59, 45, 40, 43, 55

Step # 2 : Element 45

56, (59), (45), 40, 43, 55

(56), (45), 59, 40, 43, 55

45, 56, 59, 40, 43, 55

Step # 3 : Element 40

45, 56, (59), (40), 43, 55

45, (56), (40), 59, 43, 55

(45), (40), 56, 59, 43, 55

40, 45, 56, 59, 43, 55

Step # 4 : Element 43

40, 45, 56, (59), (43), 55

40, 45, (56), (43), 59, 55

40, (45), (43), 56, 59, 55

40, 43, 45, 56, 59, 55

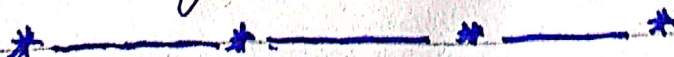
Step # 5 : Element 55

40, 43, 45, 56, (59), (55)

40, 43, 45, (56), (55), 59

40, 43, 45, 55, 56, 59

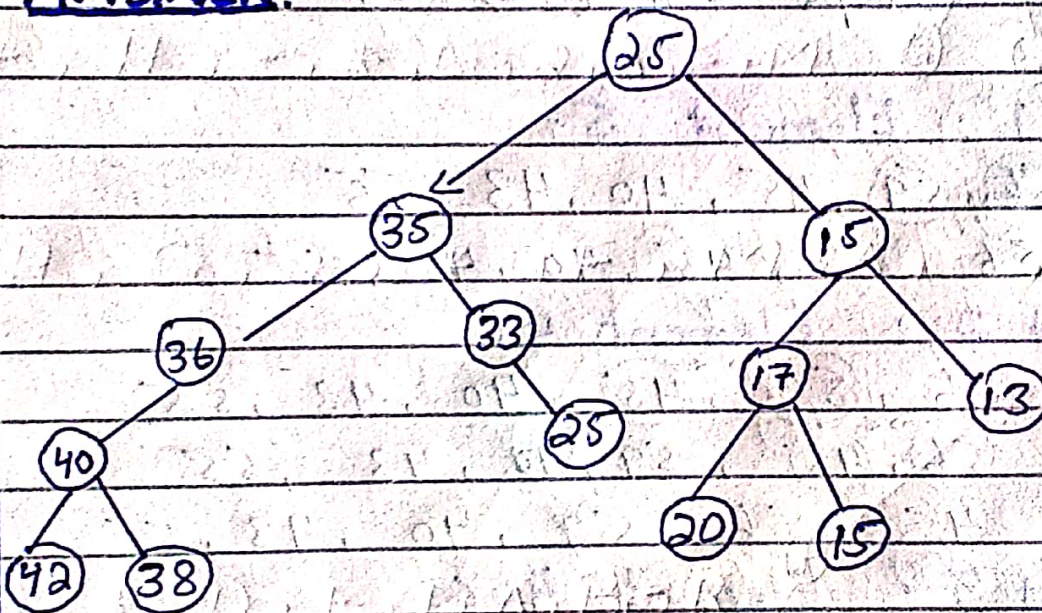
So the given list is sorted



QUESTION - No - 2

Construct Binary Tree from given List of numbers and then verify:
25, 15, 35, 17, 33, 36, 25, 13, 15, 40,
38, 42, 20

ANSWER:



verifying using In-order Traversal

42, 40, 38, 36, 35, 33, 25, 25, 20, 17, 15,
15, 13

The list is sorted in reverse order.



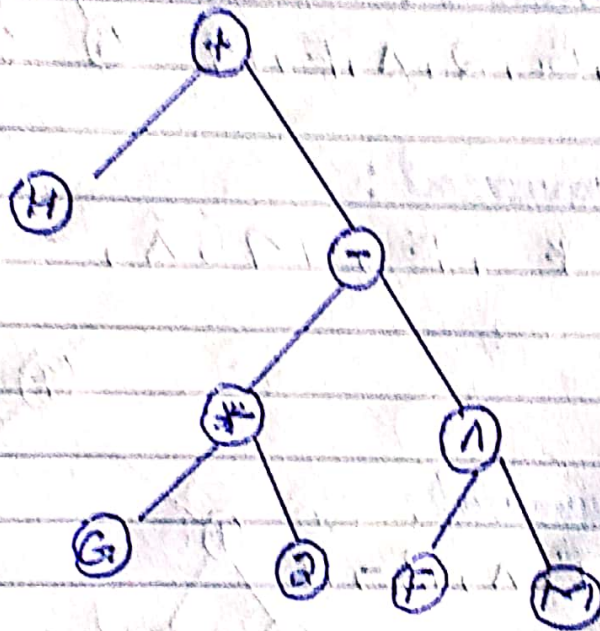
QUESTION - No - 3

Construct Binary Trees from given Mathematical Expressions.

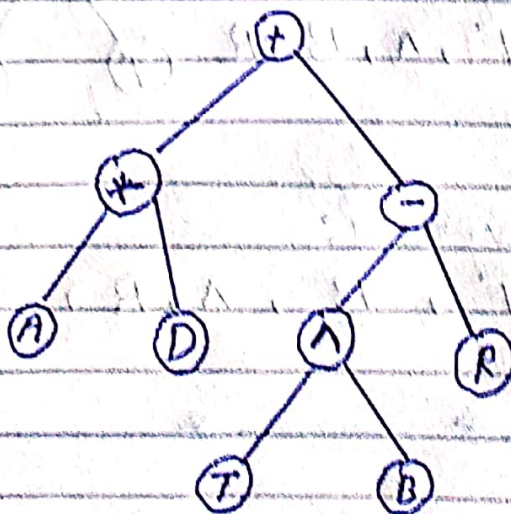
PART (i):-

$$H + G * 2 - (F \wedge M)$$

ANSWER:

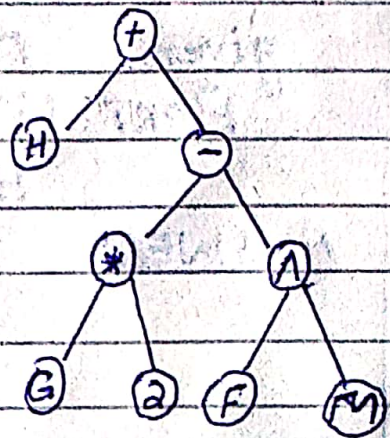


PART (ii) :- $A * D + T \wedge B - R$



QUESTION - No - 4

PART (i)



(1) - In-order Traversal:

H, +, G, *, 2, -, F, ^, M

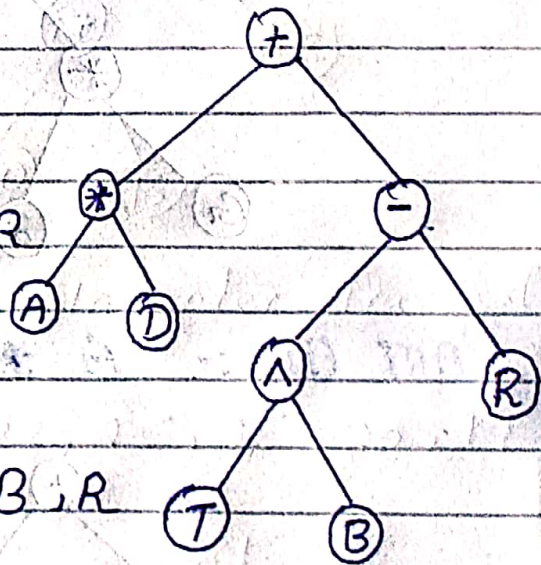
(2) - Pre-order Traversal:

+, H, -, *, G, 2, ^, F, M

(3) - Post-order Traversal:

H, G, 2, *, F, M, ^, -, +

PART (ii)



(1) - In-order Traversal:

A, *, D, +, T, ^, B, -, R

(2) - Pre-order Traversal:

+, *, A, D, -, T, ^, B, R

(3) - Post-order Traversal:

A, D, *, T, B, ^, R, -, +



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QUESTION - No - 5

Fill in the blanks.

- i- Elements of a Tree is called Node.
- ii- The graphical line drawn between Nodes of a tree is called Edge.
- iii- Level Number of a Root is First subset.
- iv- All those nodes with same level Number belong to Some family.
- v- The left - Most child Node is Older Node.
- vi- The Right - Most child Node is Younger Node.
- vii- A Tree is a Non-linear Data structure.
- viii- An ordered set of ordered Trees is called a Forest.

