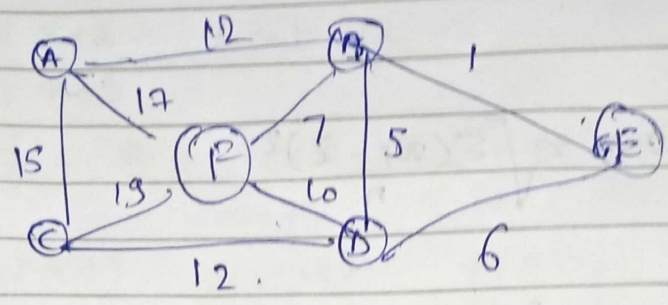


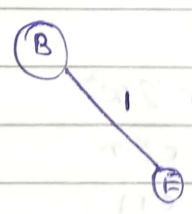
UNIT: 6

(1).

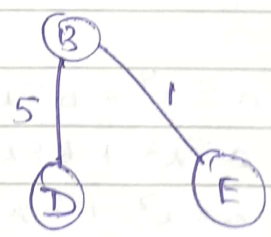


- ~~AB = 12~~ BE = 1
- BD = 5
- DE = 6
- BF = 7
- DF = 10
- AB = 12
- CD = 12
- AC = 15
- AF = 17
- CF = 19

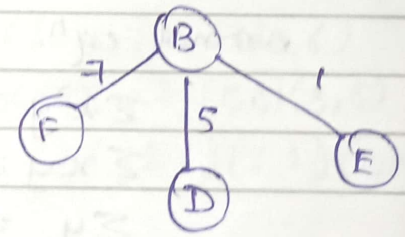
BE (1)



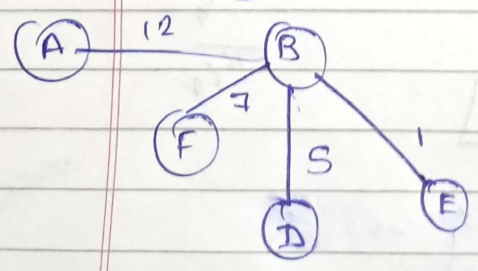
BD (5)



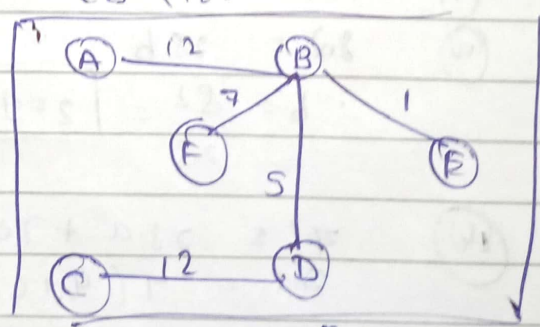
BF (7)



AB (12)



CD (12)

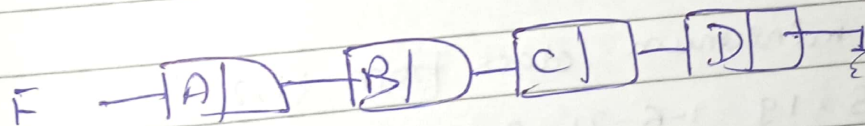
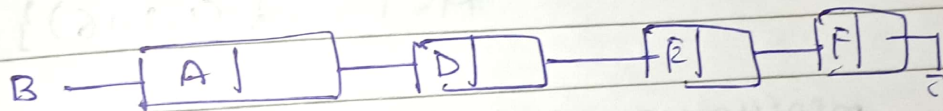
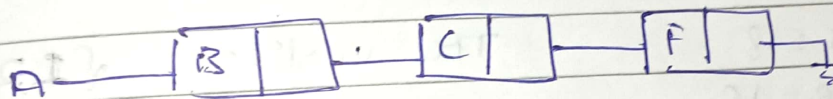


Required: m.s.T of weight
 $12 + 12 + 7 + 5 + 1 = 37$

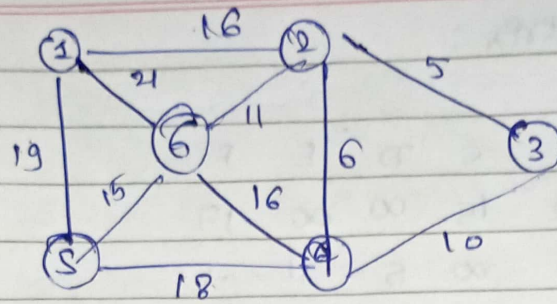
Q) Adjacency matrix:

	A	B	C	D	E	F
A	∞	12	15	∞	∞	17
B	12	∞	∞	5	1	7
C	15	∞	∞	12	∞	19
D	∞	5	12	∞	6	10
E	∞	1	∞	6	∞	∞
F	17	7	19	10	∞	∞

Q) Adjacency list:



Q.4]



$$1, 2 = 16$$

$$5, 6 = \infty$$

$$1, 5 = 19$$

$$1, 6 = 21$$

$$2, 3 = 5$$

$$2, 4 = 6$$

$$2, 6 = 11$$

$$3, 4 = 10$$

$$4, 5 = 18$$

$$4, 6 = 16$$

Tree vertices: $\{1\}$

Edges from 1:

$$1, 2 = 16 ; 1, 5 = 19, 1, 6 = 21$$

$$\therefore \text{minimum} = 1-2.$$

Tree vertices: $\{1, 2\}$

$$\text{MST} = \{(1, 2, 16)\}$$

minimum edges from $\{1, 2\}$.

$$1, 5 = 19, 1, 6 = 21, 2, 6 = 11, 2, 4 = 6, 2, 3 = 5$$

$$\therefore \text{minimum} = 2-3$$

Tree vertices: $\{1, 2, 3\}$

$$\text{MST edges} = \{(1, 2, 16), (2, 3, 5)\}$$

minimum edges from $\{1, 2, 3\}$

$$1, 5 = 19, 1, 6 = 21, \underline{2, 4 = 6}, 2, 6 = 11, 3, 4 = 10$$

Tree vertices: $\{1, 2, 3, 4\}$

$$\text{MST edges} = \{(1, 2, 16), (2, 3, 5), (2, 4, 6)\}$$

minimum edge from $\{1, 2, 3, 4\}$

$$1-6=21, 1-5=19, 2-6=11, \cancel{3-4=10}, 4-5=18, 4-6=16$$

Tree vertices $\{1, 2, 3, 4\}, 6\}$

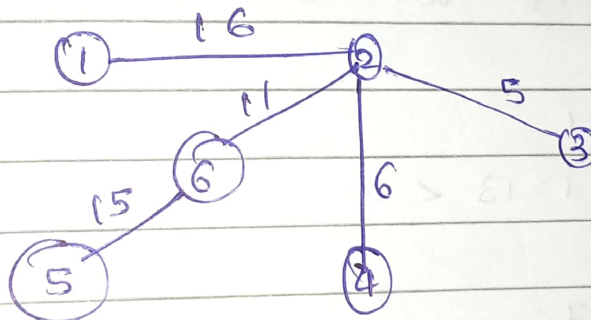
MST edges: $\{(1, 2, 16), (2, 3, 8), (2, 4, 6), (2, 6, 11)\}$

Remaining vertex = 5.

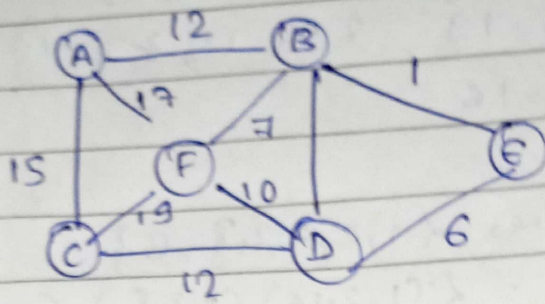
$$1-5=19, \cancel{4-5=18}, \boxed{5-6=15}$$

Tree vertices: $\{1, 2, 3, 4, 5, 6\}$

MST edges: $\{(1, 2, 16), (2, 3, 8), (2, 4, 6), (2, 6, 11), (5, 6, 15)\}$



MST:



✓

A	B	C	D	E	F
0	12	15	∞	∞	17

min-dist to B \therefore Fixing B

✓

✓

A	B	C	D	E	F
0	12	15	∞	13	17

$$B-E = 1$$

$$\therefore 12 + 1 = 13 < \infty$$

$$B-F = 7$$

$$12 + 7 = 19 > 17$$

\therefore choose 17.

min-dist : E \therefore Fix E

✓

✓

✓

A	B	C	D	E	F
0	12	15	19	13	17

$$E-D = 6$$

$$\therefore 13 + 6 = 19 < \infty$$

$$\therefore D \rightarrow 19$$

\checkmark
 A B C D E F
 0 12 15 19 13 17

$$C-D = 12$$

$$\therefore 12 + 15 = 27 > 19$$

$$\therefore D \rightarrow 19$$

$$CF = 19$$

$$\therefore 15 + 19 = 34 > 17$$

$$\therefore F \rightarrow 17$$

Box: ~~D~~ F.

\checkmark	\checkmark	\checkmark	\times	\checkmark	\checkmark
A	B	C	D	E	F
0	12	15	19	13	17

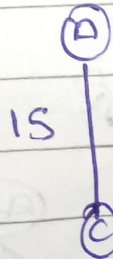
$$F \rightarrow D = 10$$

$$17 + 10 = 27 > 19$$

$$\therefore D = 19$$

\Rightarrow Shortest path from vertex
 A to C will be:

A \rightarrow C of weight 15

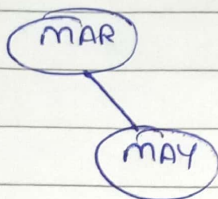


UNIT: 5

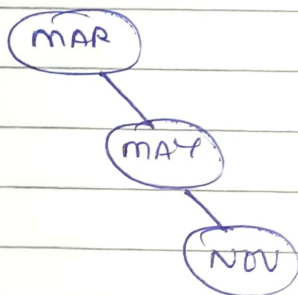
A) MAR, MAY, NOV, AUG, APR, DEC, JUL, FEB, JUN, OCT, SEP

(i) MAR

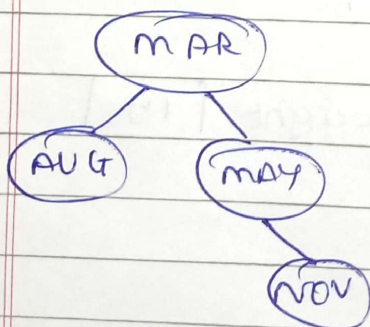
(ii) MAR < MAY



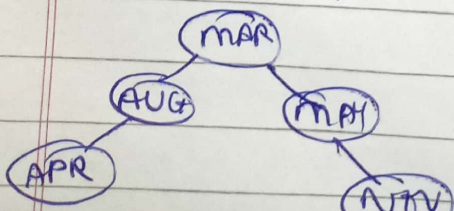
(iii) MAR < MAY < NOV



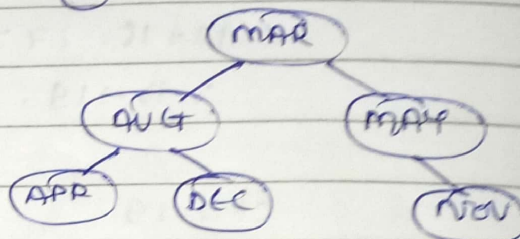
(iv) MAR > AUG



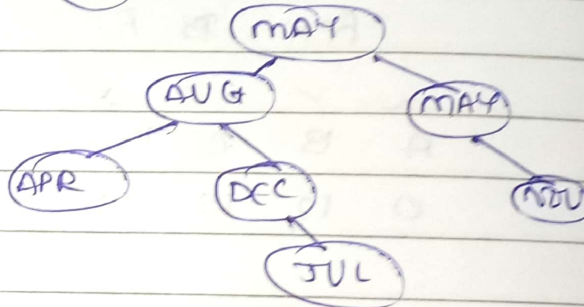
(v) MAR > AUG > APR



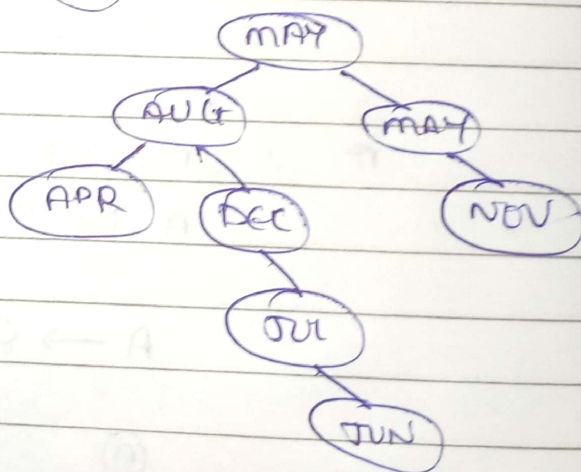
(vi) MAR > DEC > AUG



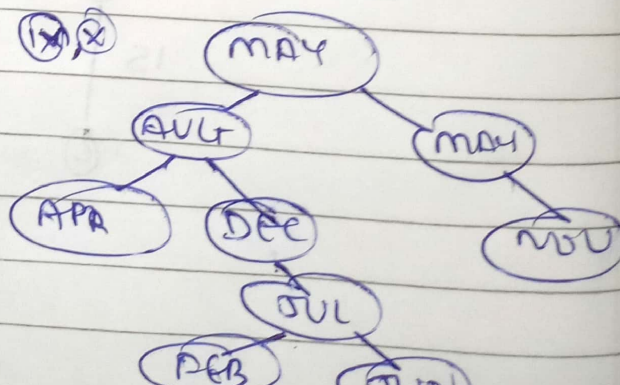
(vii) DEC < JUL



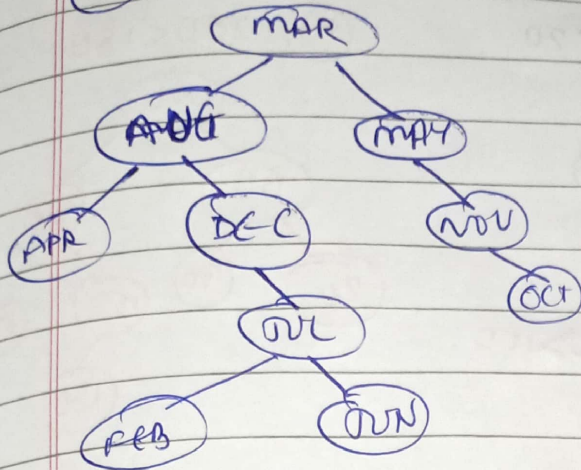
(viii) ~~THINKING~~ DEC < FEB <



(ix) (x)

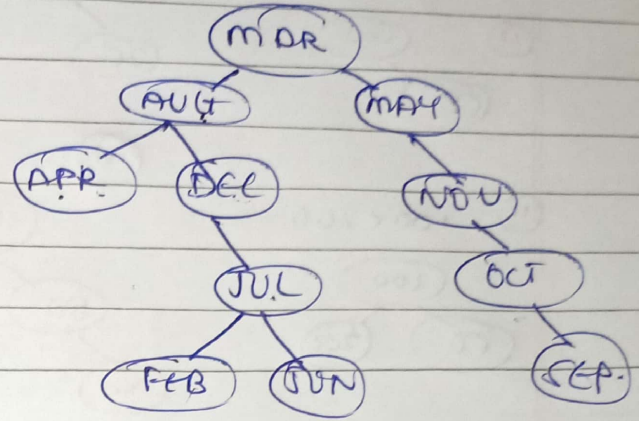


(X) NOV < OCT



(XII) OCT < SEP

∴ Final BST:



Inorder: Left → Root → Right.

APR, AUG, DEC, FEB, JUL, JUN, MAR, MAY, NOV, OCT, SEP

Post order: Left → Right → Root.

APR, FEB, JUN, JUL, DEC, AUG, SEP, OCT, NOV, MAY, MAR.

Preorder: Root → Left → Right.

MAR, AUG, APR, DEC, JUL, FEB, JUN, MAY, NOV, OCT, SEP.

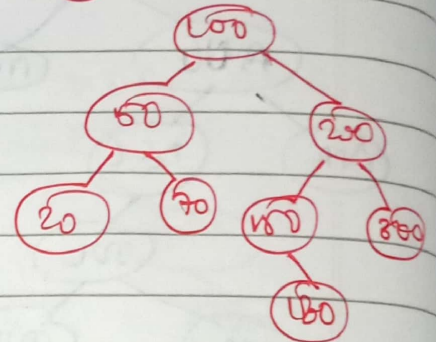
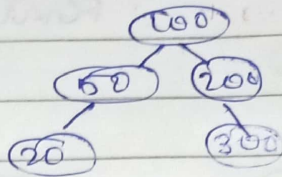
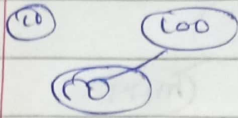
B) 100, 50, 200, 300, 20, 100, 70, 180, 120, 30.

(i)

(ii) 50 > 20

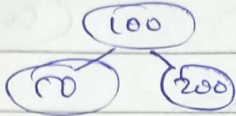
(iii) 150 < 180

50 < 100



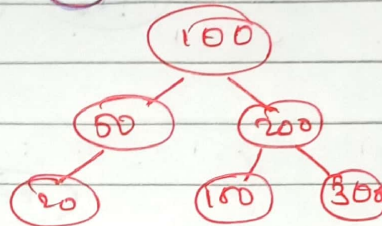
(iv)

100 < 200



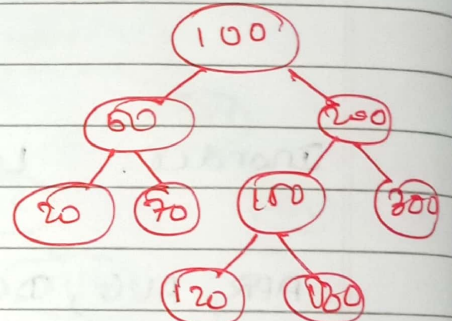
(v)

200 > 100



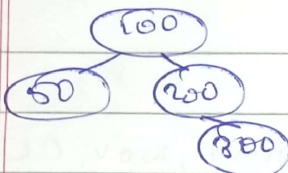
(vi)

150 > 120



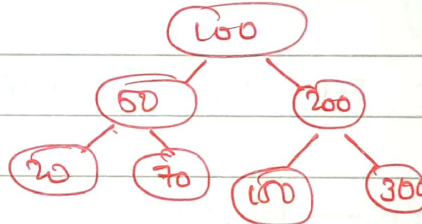
(vii)

200 < 300



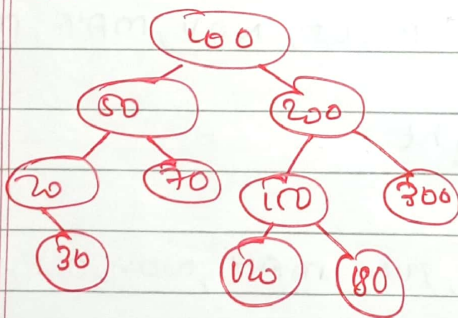
(viii)

50 < 70



(ix)

20 < 30



→ Required BST

(i)

Inorder: L-Root-R

20, 30, 50, 70, 100, 120, 150, 180, 200, 300

(ii)

postorder: L-R-Root

30, 20, 70, 50, 120, 180, 150, 300, 200, 100

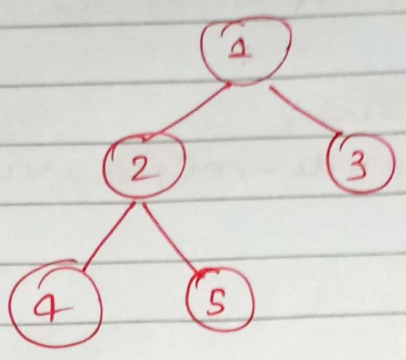
(iii)

preorder: Root → L → R

100, 50, 20, 30,

100, 50, 20, 30, 70, 200, 150, 120, 180, 300

Index.

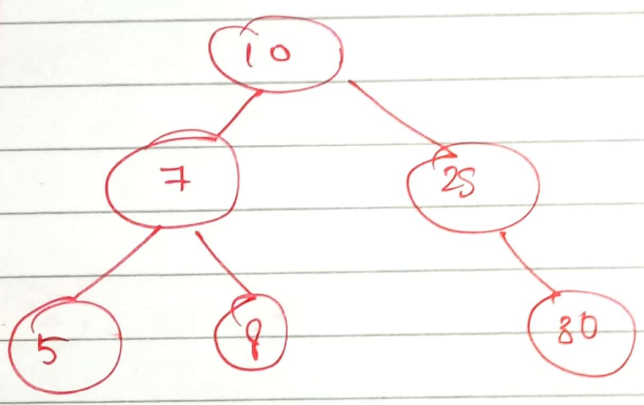


Root node : 0
 left child : $2i+1$
 right child : $2i+2$

value 1 2 3 4 5
 In dex. 0 1 2 3 4

	1	2	3	4	5
i =	0	1	2	3	4

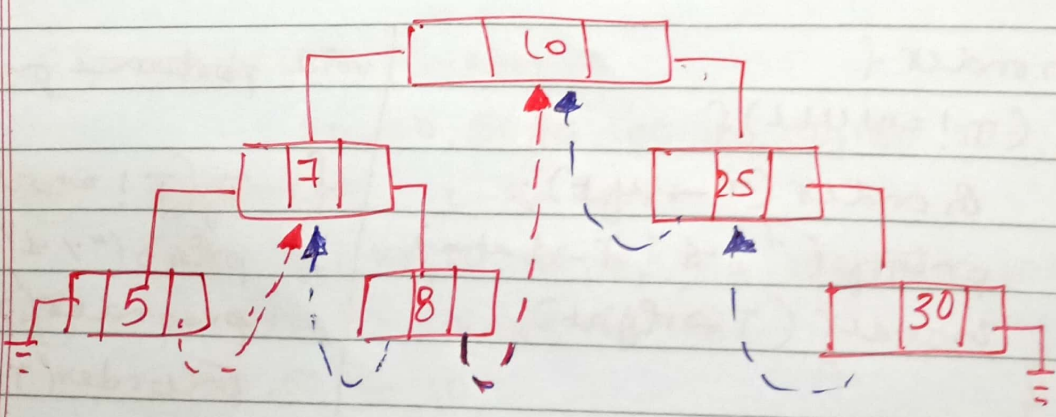
Q. 8.



Inorder traversal: Left \rightarrow Root \rightarrow Right.

~~5 7 8 10 25 30~~

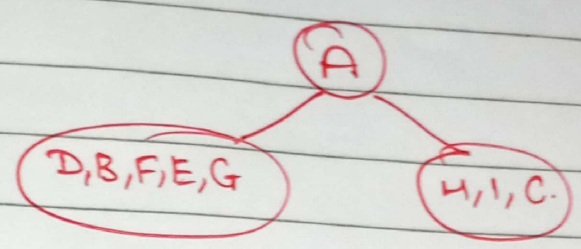
5	7	8	10	25	30
---	---	---	----	----	----



Inorder: DBF EGA H I C

Postorder: D F G E B I H C A

(i)



```
typedef struct node {  
    int data;  
    struct node* next;  
} node;
```

(ii)

