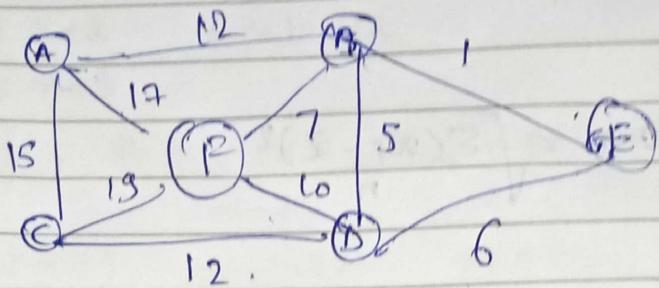


UNIT: 6

①.



$$BE = 1$$

$$BD = 5$$

$$DE = 6$$

$$BF = 7$$

$$DF = 10$$

$$AB = 12$$

$$CD = 12$$

$$AC = 15$$

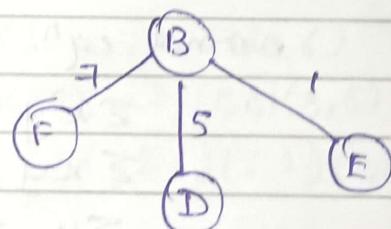
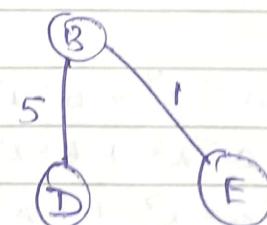
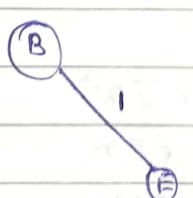
$$AF = 17$$

$$CF = 19$$

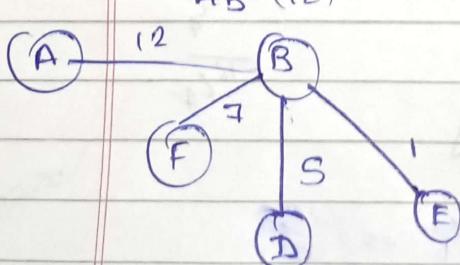
BE (1)

BD (5)

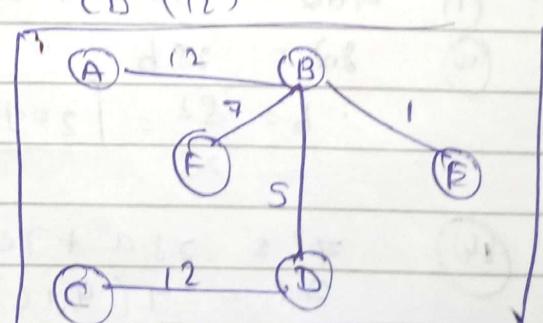
BF (7)



AB (12)



CD (12)



Required: M.S.T of weight

$$12 + 12 + 7 + 5 + 1 = 37$$

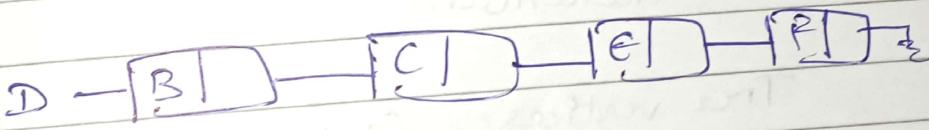
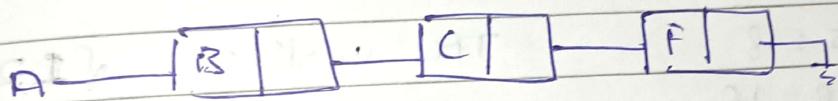
(2)

Adjacency matrix:

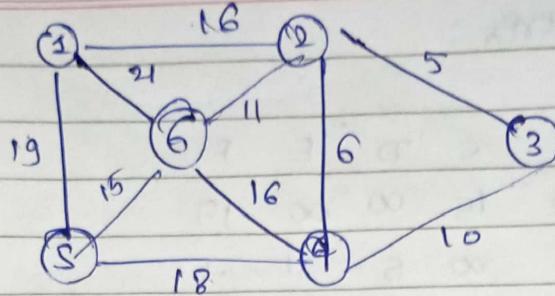
	A	B	C	D	E	F
A	00	12	15	00	00	17
B	12	00	00	5	1	7
C	15	00	00	12	00	19
D	00	5	12	00	6	10
E	00	1	00	6	00	00
F	17	7	19	10	00	00

(3)

Adjacency list:



Q.4]



$1,2 = 16$

$5,6 = 00$

$1,5 = 19$

$1,6 = 21$

$2,3 = 5$

$2,4 = 6$

$2,6 = 11$

$3,4 = 10$

$4,5 = 18$

$4,6 = 16$

Tree vertices: $\{1\}$

Edges from 1:

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

minimum = 1-2.

Tree vertices: $\{1,2\}$ 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 minimum = 2-3Tree vertices: $\{1,2,3\}$ 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: $\{1,2,3,4\}$ MST edges = $\{(1,2,16), (2,3,5), (2,4,6)\}$

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

$$1-6 = 21, 1-8 = 19, 2-6 = 11, \cancel{3-4=10}, 4-5 = 18.$$

$$4-6 = 16$$

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

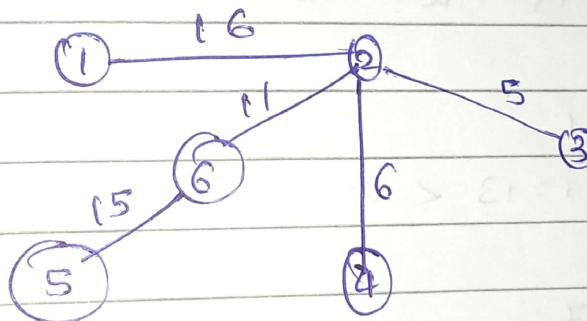
MST edges : $\{(1, 2, 16), (2, 3, 8), (2, 4, 6), (4, 6, 11)\}$

Remaining vertex = 5.

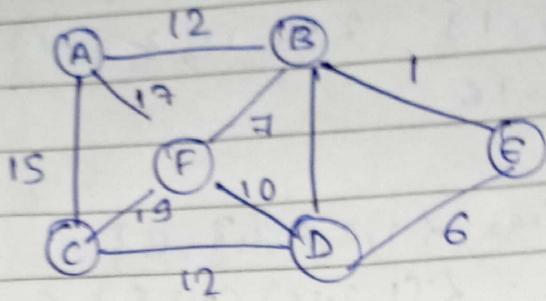
$$1-5 = 19, \cancel{5-6} \quad 4,5 = 18, \boxed{5-6 = 18}$$

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

MST edges : $\{(1, 2, 16), (2, 3, 8), (2, 4, 6), (4, 6, 11), (5, 6, 18)\}$



MST :



✓

A	B	C	D	E	F
0	12	15	∞	∞	17

min-dist to B . . . Fixing B

✓

A	B	C	D	E	F
0	12	15	∞	13	17

$$B-E = 1$$

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

$$B-F = 7.$$

$$12+7=19 > 17$$

∴ choose 17.

min-dist : E . . . fix E

✓

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

$$E-D = 6$$

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

∴ D → 19

A B C D ✓
 O 12 15 19 13 17

$$CD = 12$$

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

$$\therefore D \rightarrow 19,$$

$$CF = 19$$

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

$$\therefore F \rightarrow 17.$$

$$Rox : F.$$

✓ ✓ ✓ X ✓ ✓
 A B C D E F.
 O 12 15 19 13 17

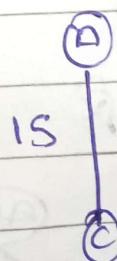
$$F \rightarrow D = 10$$

$$17 + 10 = 27 > 19$$

$$\therefore D \rightarrow 19.$$

Q ∵ Shortest path from vertex
 A to C will be :

A → C . of weight 15



UNIT: C

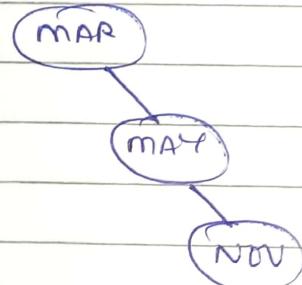
A) MAR, MAY, NOV, AUG, APR, DEC, JUL, FEB, JUN, OCT, SEP

i) MAR

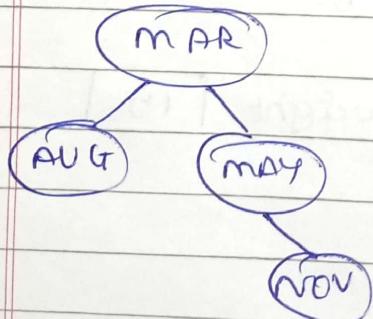
ii) MAR < MAY



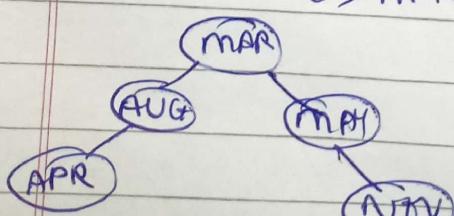
iii) MAR < MAY < NOV



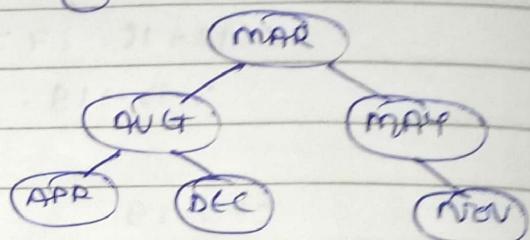
iv) MAR > AUG



v) MAR > AUG > APR



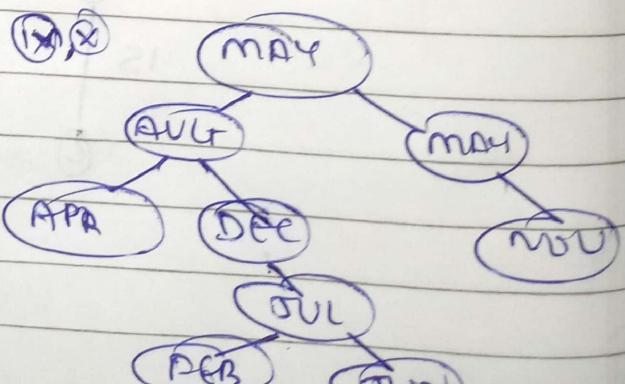
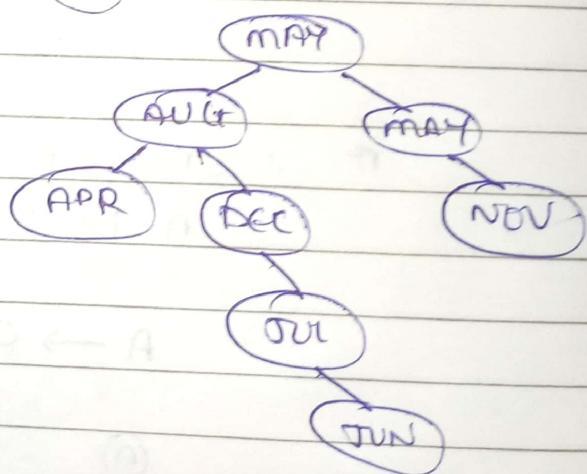
vi) MAR > DEC > AUG



vii) DEC < JUL

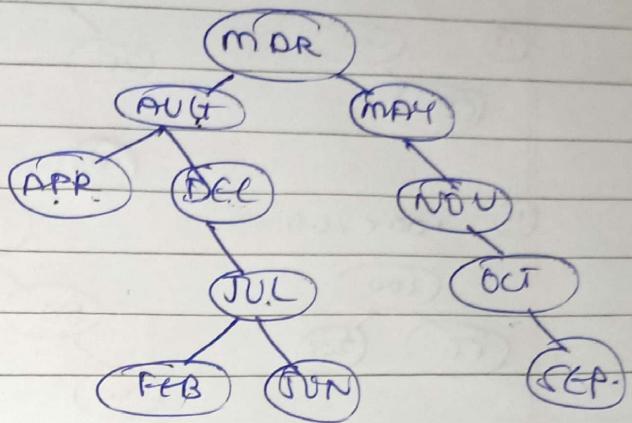


viii) THANKSGIVING DEC < FEB <





(w) 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, 150, 70, 180, 120, 30.

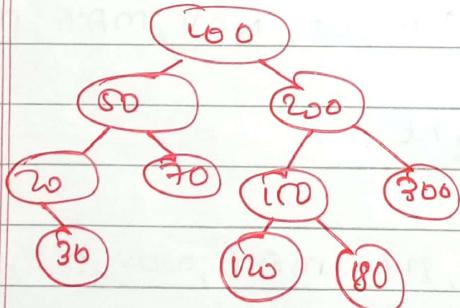
(v) $50 < 100$

(vi) $100 > 20$

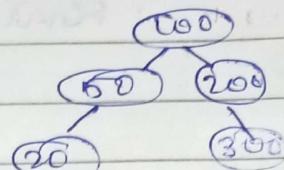
(vii) $100 < 200$

(viii) $200 < 300$

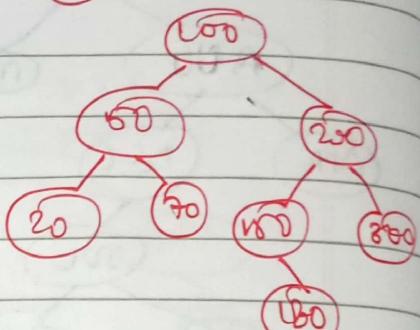
(ix) $20 < 30$



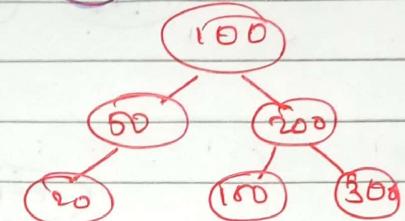
(x) $50 > 20$



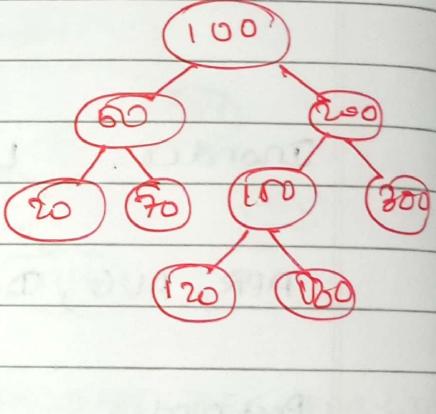
(xi) $150 < 180$



(xii) $200 > 100$



(xiii) $150 > 120$



→ required BST

(i) Inorder : L-Root-R

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

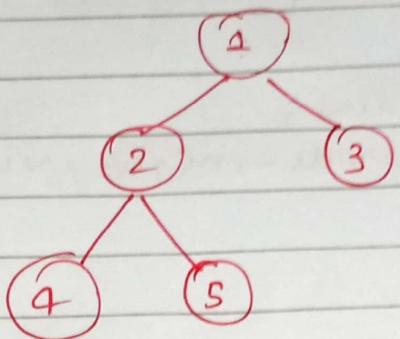
(ii) postorder : L-R-Root.

80, 20, 30, 50, 120, 180, 150, 300, 200, 100

(iii) preorder : Root → L → R.

100, 50, 20, 30,

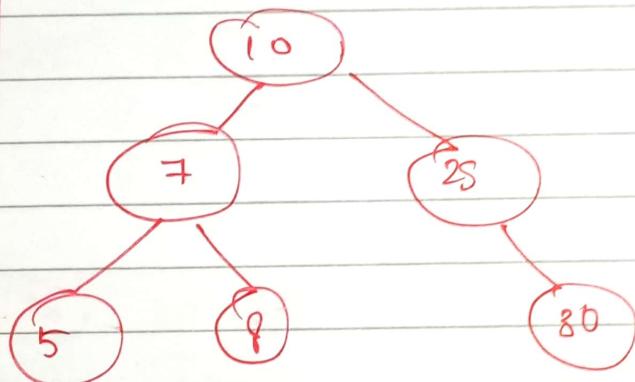
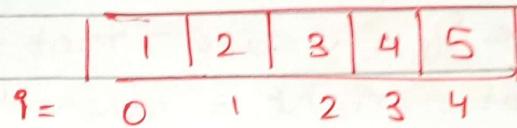
100, 50, 20, 30, 70, 200, 100, 120, 180, 300



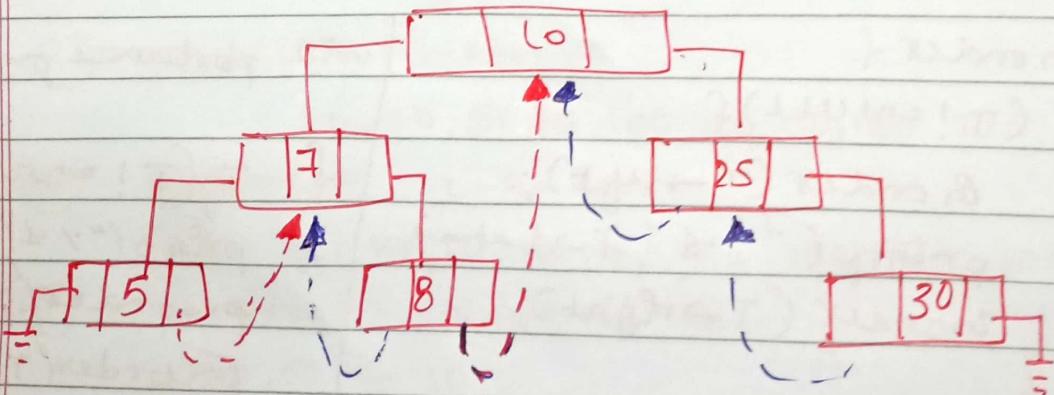
Index.

root node : 0
 left child : $2^e + 1$
 right child : $2^e + 2$.

value	1	2	3	4	5
end pos.	0	1	2	3	4

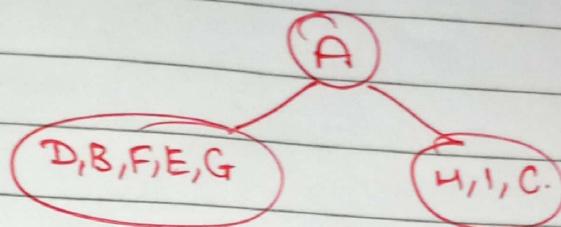


Inorder traversal: Left \rightarrow Root \rightarrow Right.



Inorder: DBF EGA HIC
 Postorder: D F G E B I H C A

(i)



```

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

(ii)

