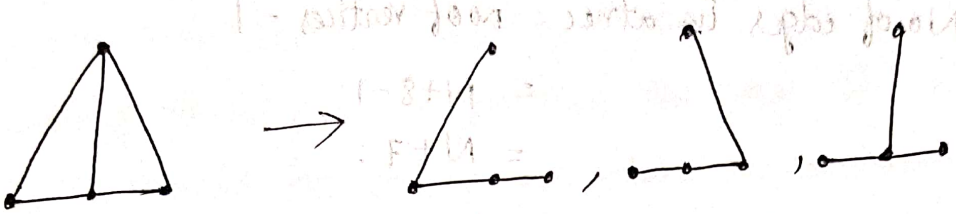
Module-5.

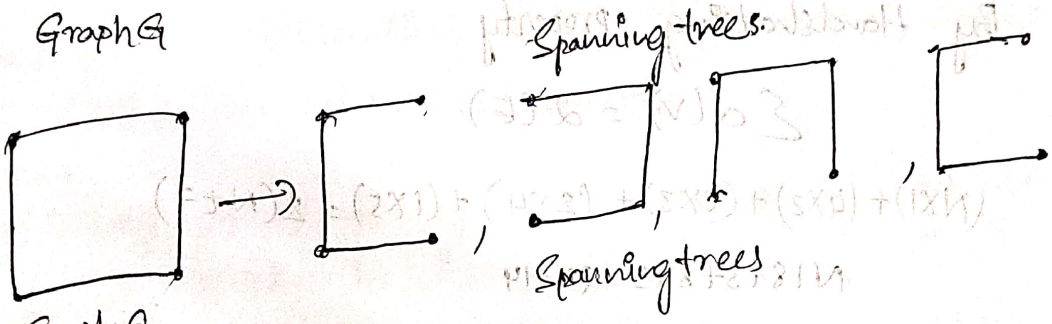
2. Spanning tree:-

A Subgraph T of Graph G is called a Spanning tree when T is a tree contains all vertices of G



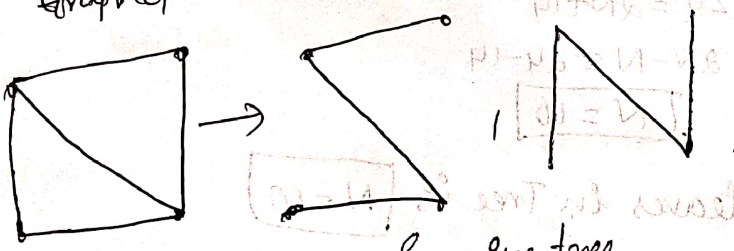
Graph G

Spanning trees.



Graph G

Spanning trees



Spanning tree.

3. Given Outlets (m) = 2 (m-ary tree).

Computers (P) = 10 (leaves)

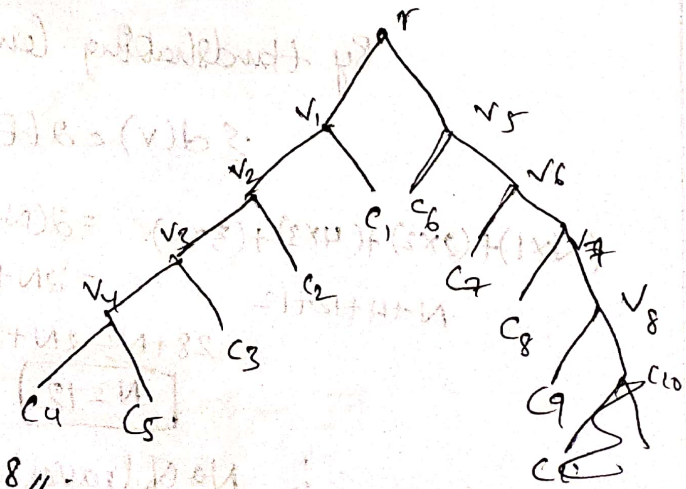
Here we need to find Internal Vertices for Setup (It is like we need to find no of Sockets we need to connect cords & computers in which Cords have only two Sockets).

$$q = \frac{P-1}{m-1}$$

$$q = \frac{10-1}{2-1}$$

$$q = 9/1$$

$$q = 9$$



Here no of cord required = q - 1 = 8 Ω.

4.

Let N be no of pendant vertices (degree one) in T

The total no of vertices in tree

$$T = N+4+1+2+1 = N+8.$$

∴ No. of edges in a tree = no of vertices − 1

$$= N+8-1$$

$$= N+7.$$

By Handshaking property

$$\sum d(v) = 2(E)$$

$$(N\times1)+(4\times2)+(1\times3)+(2\times4)+(1\times5) = 2(N+7)$$

$$N+8+3+8+5 = 2N+14$$

$$N+24 = 2N+14$$

$$2N-N = 24-14$$

$$\boxed{N = 10}.$$

∴ No of leaves in Tree is $\boxed{N = 10}$

5. Given no of pendant vertices be N.

Total no of vertices ⇒

$$N+2+4+3 = N+9$$

No of edges $= N+9-1$

$$\boxed{E = N+8}$$

By Handshaking Lemma.

$$\sum d(v) = 2(E)$$

$$(N\times1)+(2\times2)+(4\times3)+(3\times4) = 2(N+8)$$

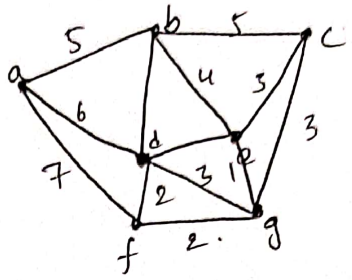
$$N+4+12+12 = 2N+16$$

$$28+N = 2N+16$$

$$\boxed{N = 12}$$

∴ No of leaves in Tree is $N = 12$

6. Here they have Given a graph that consists of 7 vertices in the sense we should have (7-1)=6 vertices in our Minimum Spanning tree.



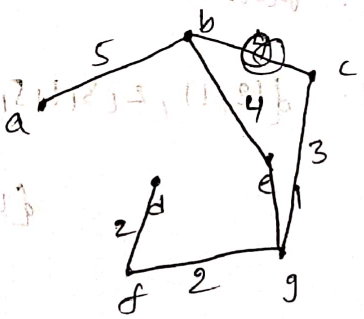
According to Krushals Algorithm the edge with min weight should be considered when we written all the edges in Ascending order. By joining we should get a tree with all vertices connected.

Edge	eg	fg	df	de	dg	gc	cc	be	bc	ba	ad	af
weight	1	2	2	2	3	3	3	4	5	5	6	7.
Select	Yes	Yes	Yes	no	~~No~~	Yes	no.	Yes	no	Yes	no	no.

weight of tree = eg+fg+df+gc+be+ba

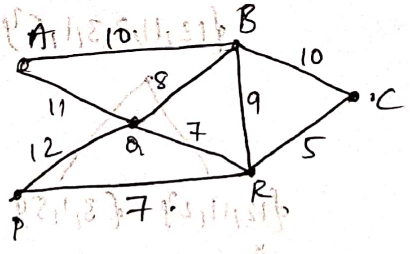
= 1+2+2+3+4+5

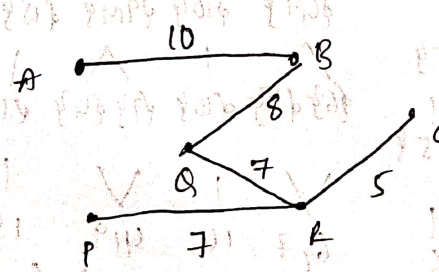
weight of tree = 17.



8.

Edge	RC	PR	QR	BQ	BR	BC	AB	AQ	PQ
weight	5	7	7	8	9	10	10	11	12
Select	Yes	Yes	Yes	Yes	no	no	Yes	no	no

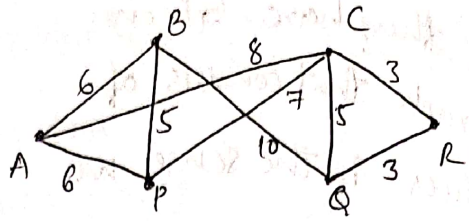




weight of tree = PR+RC+QR+BQ+AB

weight of tree = 7+5+7+8+10 = 37.

7.

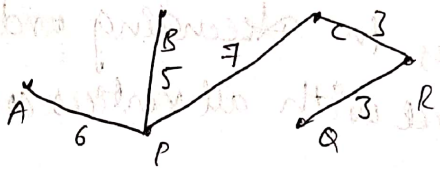


Edges	QR	CR	BP	AP	AB	PC	AC	BQ
weight	3	3	5	6	6	7	8	10
Selection.	Yes	Yes	Yes	Yes	no	Yes	no	no

weight = QR + CR + BP + AP + PC

= 3 + 3 + 5 + 6 + 7

weight = 24



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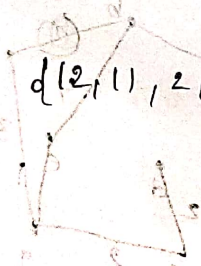
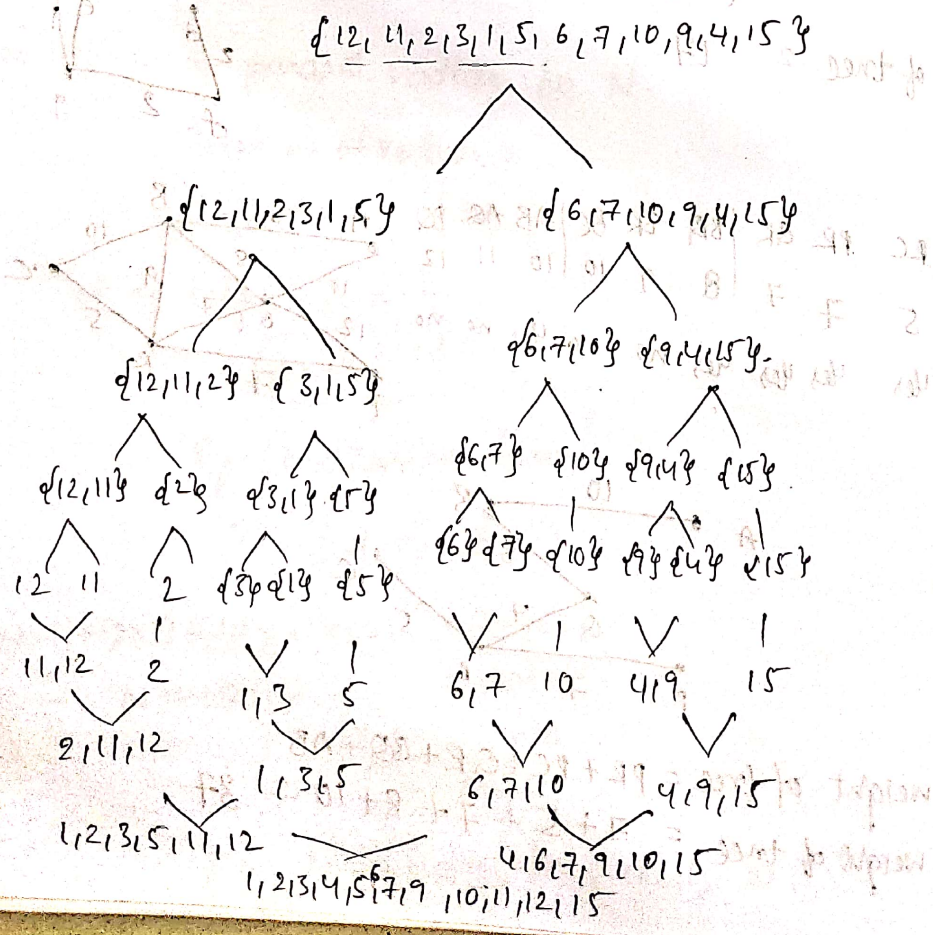
11. Module-5 " " : 49.

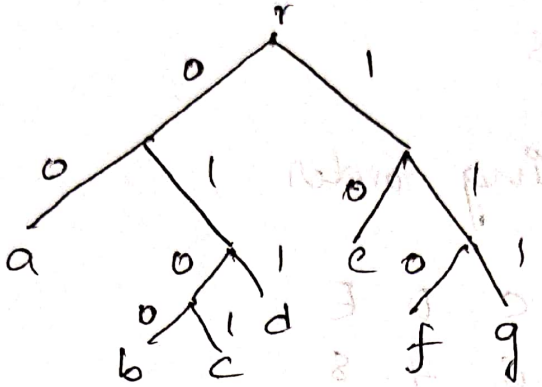
12. {12, 11, 2, 3, 1, 5, 6, 7, 10, 9, 4, 15}.





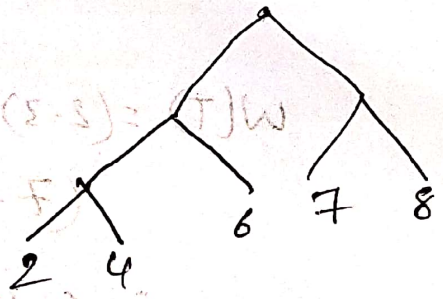
13. Same as above

14.



Leaf	a	b	c	d	e	f	g
Sequence	00	0100	0101	011	10	110	111

15.



Sol Given set of integers = {2, 4, 6, 7, 8}

$$w(T) = (2 \cdot 3) + (4 \cdot 3) + (6 \cdot 2) + (7 \cdot 2) + (8 \cdot 2)$$

$$= 6 + 12 + 12 + 14 + 16$$

$$w(T) = 60$$

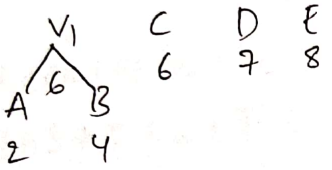
16.

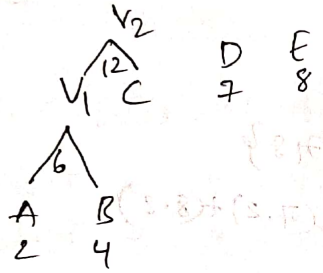
16

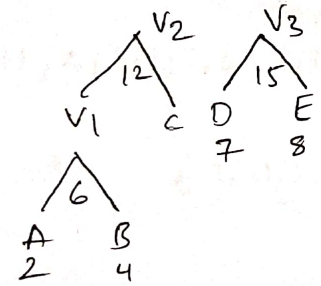
A	B	C	D	E
2	4	6	7	8

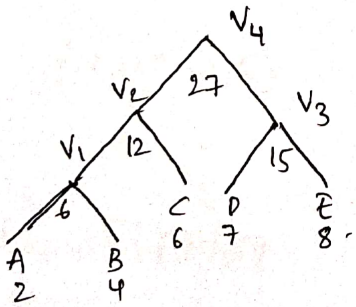
1. Arrange in Ascending order.

A	B	C	D	E
2	4	6	7	8









$W(T) = (2 \cdot 3) + (4 \cdot 3) + (6 \cdot 2) + (7 \cdot 2) + (8 \cdot 2)$

$= 6 + 12 + 12 + 14 + 16$

$= 60$ @.

17. Module-5 Slideno : 33

18. Module-5 Slide no : 36