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Q→ What is MST ? applications.

→ A spanning tree which visits all the nodes the sum of the weights is as minimum as possible plus it should not form cycles & total no of edges = no of nodes − 1.

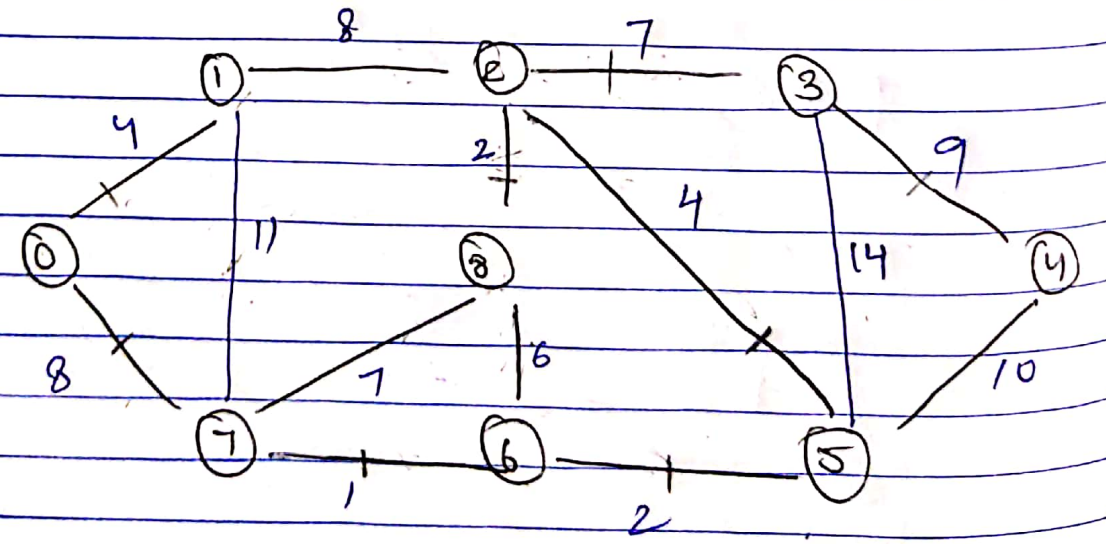
Applications.

1. Design Local area network
2. In constructing highways or railways.
3. Laying pipelines.
4. Telecommunication network.

Q2.

	T.C	S.C
Kruskal	$O(V^2)$, $O(E \log V)$	$O(\log E)$
Prim	$O(V^2)$	$O(V+E)$
Dijkstra's	$O(V+E)$	$O(V+E)$
Bellman-ford	$O(VE)$	$O(V)$.

Q3)



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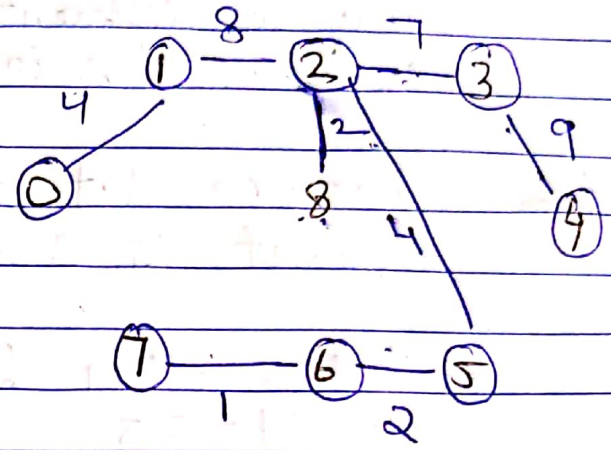
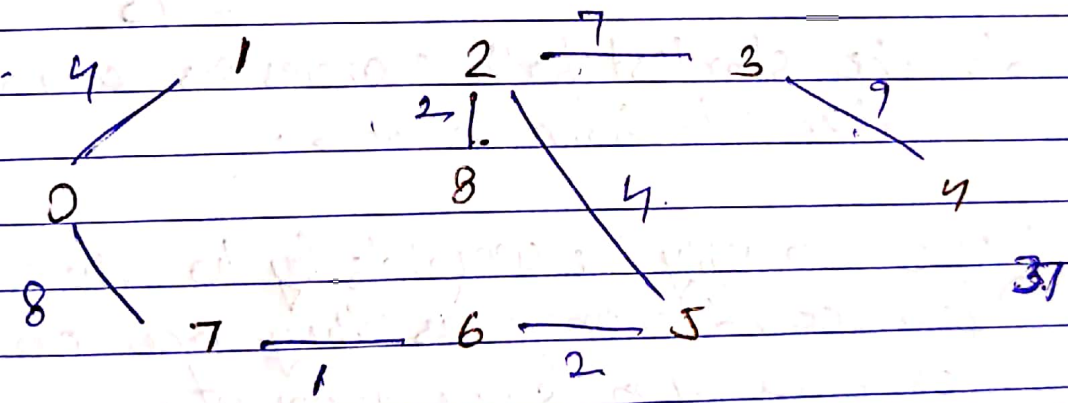
8 edges

edges	cot	
(7, 6)	1	
6, 5	2	
2, 8	2	
0 1	4	
2 5	4	
6 8	6	x
2, 3	7	
7 8	7	x
1 2	8	
7 0	8	x
3 4	9	
5 4	10	x
3 5	14	x



Prims -



In Prims we take a minimum cost edge then always select minimum cost edge which is connected to already connected vertices.

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Q4.) The shortest path may change. bcoz there may be different no° of edges in different paths from s to t.

For ex> let shortest path be of weight 15 & has 5 edges.

let another path with 2 edges and total weight = 25.

after increasing whts by 10.

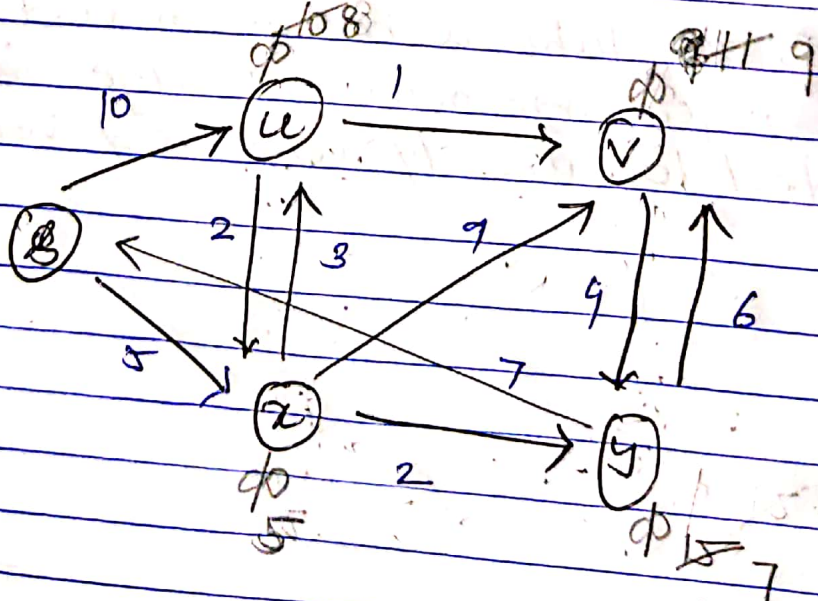
for 1st option weight becomes $15 + (5 \times 10)$
$= 65$

for 2nd weight becomes $= 25 + (2 \times 10)$
$= 45$

∴ the shortest path changes as weight got changed. from previous.

ii) If we multiply the weights by 10, the shortest path doesn't change as they are multiplied or increased in same amount.

Q5.)



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Dijkstra's

node	shortest path from src node
u	8
x	5
v	9
y	7

Bellman-ford

loop = V - 1 = 4

edges

(s,u) (s,x) (u,v) (v,y) (x,y) (x,u)
(x,v) (v,y) (y,v)

u	8
x	5
v	9
y	7

Answer same.