1

Tutorial - 06

Ques 1. :-

Minimum ~~Spanning~~ Spanning Tree (M.S.T) is a non-cyclic part of a graph this ~~has~~ can have V(vertex of graph) node and E-1 edges(E is edges in graph). It is ~~des~~ designed in a way is traversal in it is ~~mini~~ minimum

Application : (1.) It provide us various ~~to~~ way we can move from one node to another - efficiently.

(2) It can be used in ~~neural~~ Circuit creation and Network - designing.

Ques 2 :- Prim's Algorithm = $O(V^2)$ when used adjacency matrix

If we use adjacency list complexity can be reduced to $O(E \log V)$.

Space complexity : $O(V+E)$.

~~+~~ Krushkal algorithm : time Complexity $= O(E \log V)$.

Space Complexity $= O(\log E)$.

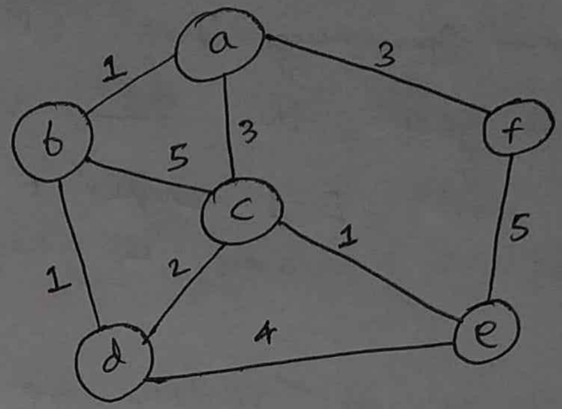
~~bel~~ Dijkstra algorithm : Time complexity $= O((E+V) \log V)$

Space Complexity $= O(V^2)$.

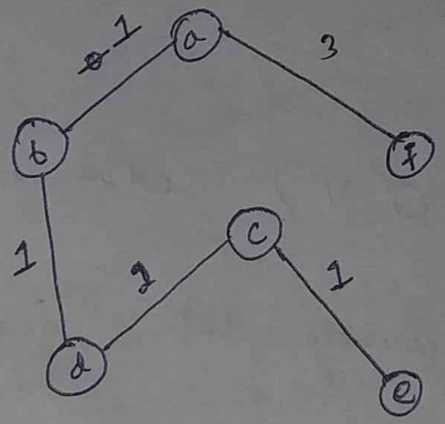
Bellman - Ford algorithm : Time Complexity $= O(V \cdot E)$

Space - Complexity $= O(NE)$.

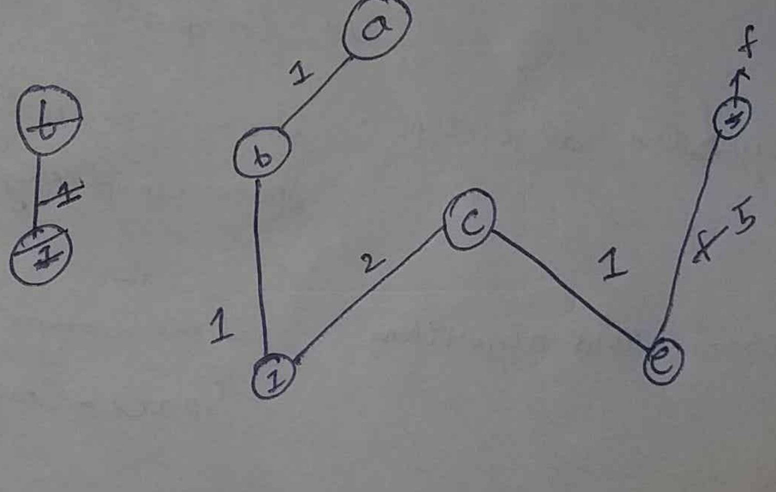
Q3



Kruskal algorithm



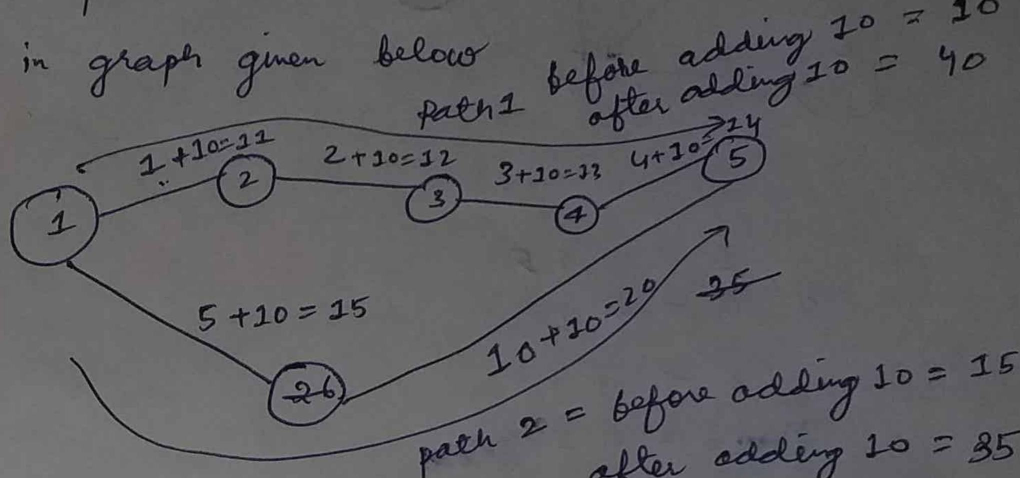
Prism algorithm



Q4:

~~(5)~~

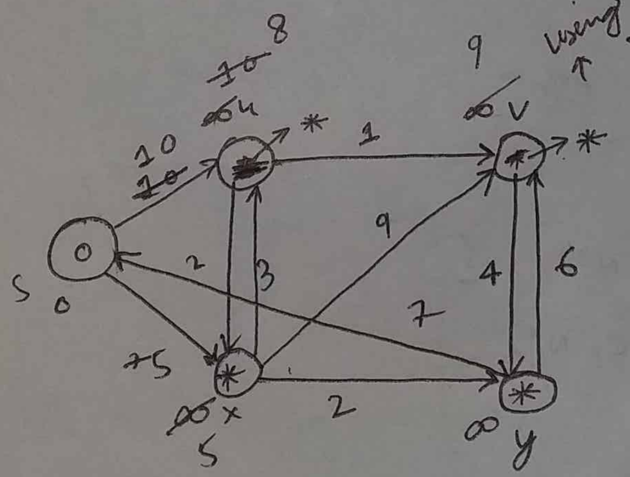
(a) Shortest path will change in the ~~sam~~ case when every pair is added with 10 as for example in graph given below

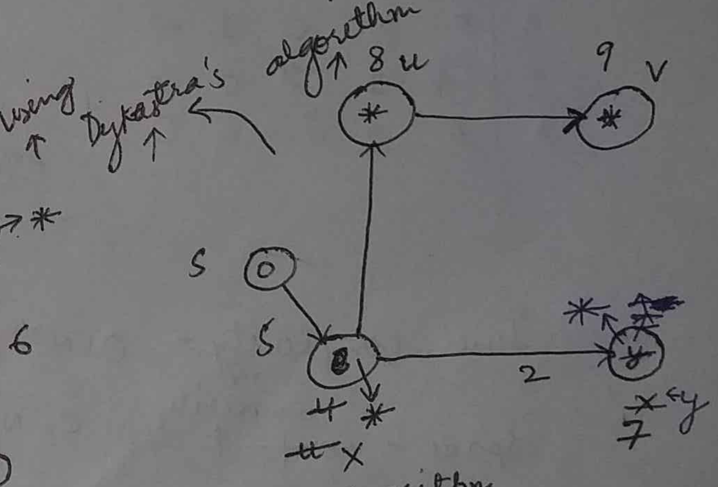


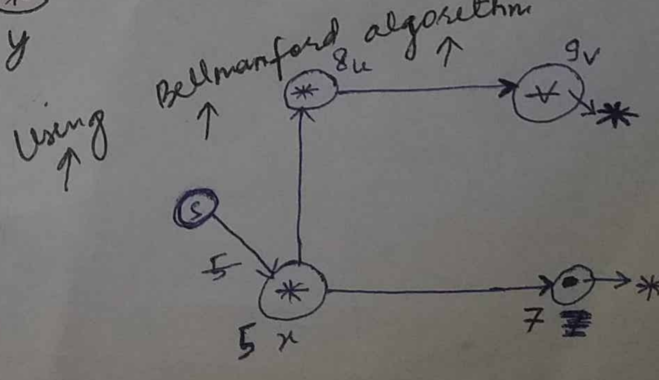
previously, the shortest path was path 1 after adding 10 path is path 2.

(b.) when each weight in graph is multipiled by 10 the ~~shorest~~ shostest ~~po~~ path remains ~~Same~~ same.

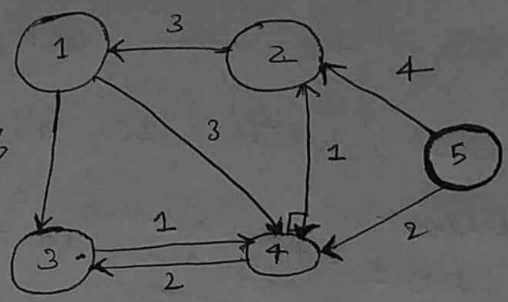
Q5:







Q 6 -



A =

	1	2	3	4	5
1	0	∞	~~∞~~ 6	3	∞
2	3	~~∞~~ 0	∞	∞	∞
3	~~6~~ ∞	∞	0	1	∞
4	∞	1	2	0	~~∞~~ ∞
5	∞	4	∞	2	0

A^1 =

	1	2	3	4	5
1	0	4	5	3	∞
2	3	0	7	6	∞
3	5	2	0	1	∞
4	~~5~~ 4	1	2	0	∞
5	6	3	3	2	0

Ans -

time - complexity = $O(N^3)$ -

Space - ~~cont~~ complexity = $O(N^2)$.