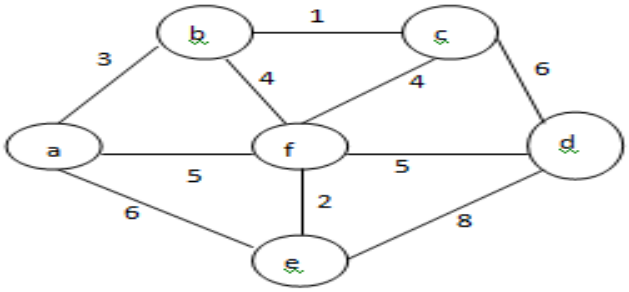
Problem:

Find minimum spanning tree of the below graph using kruskal's algorithm



Solution:

The following steps are followed in kruskal's algorithm:

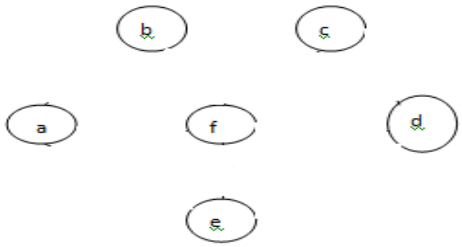
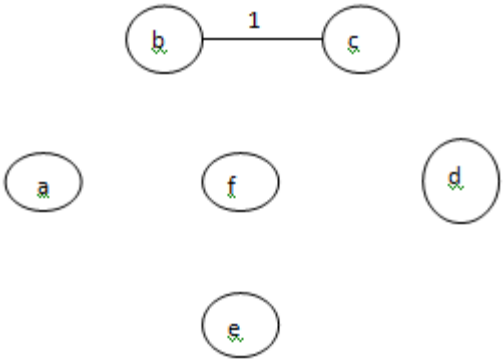
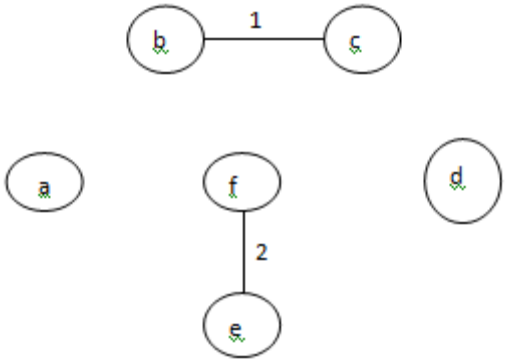
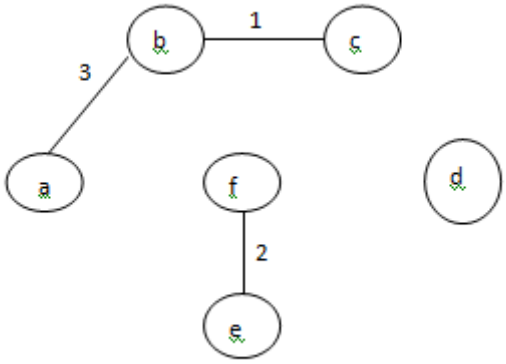
Step 1: List all the edges of the graph along with its weight

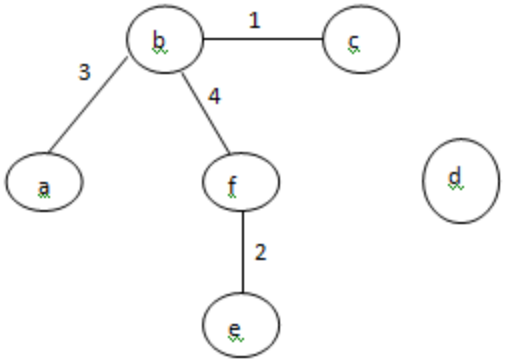
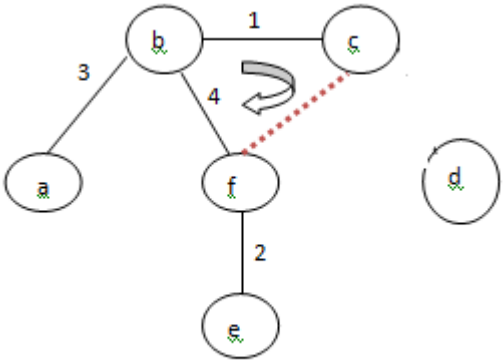
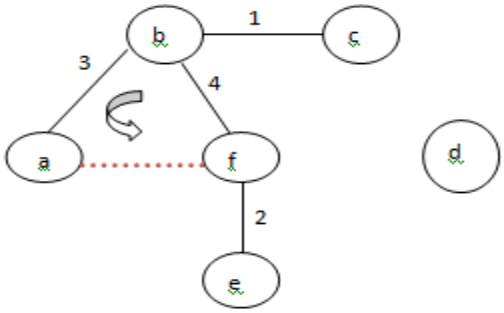
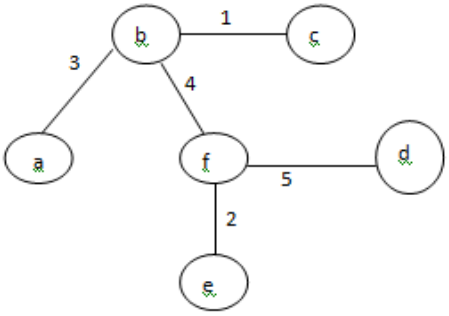
Edges	(a,b)	(a,e)	(a,f)	(b,c)	(b,f)	(c,d)	(c,f)	(d,e)	(d,f)	(e,f)
Weights	3	6	5	1	4	6	4	8	5	2

Step 2: **Sort the edges in ascending order of their weights**

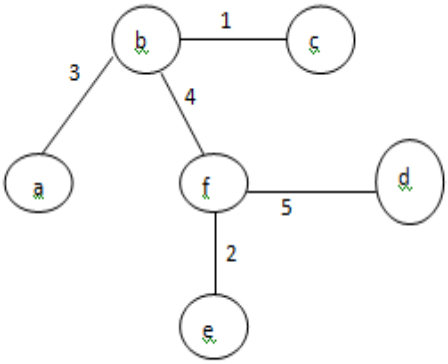
Edges	(b,c)	(e,f)	(a,b)	(b,f)	(c,f)	(a,f)	(d,f)	(a,e)	(c,d)	(d,e)
Weights	1	2	3	4	4	5	5	6	6	8

Step 3: Process in selecting edges for the minimum cost spanning tree

Edge	Weight	Stages in Kruskal's Algorithm	Remarks	No of Edges and Cost
-	-		-	No_of_edges=0 Cost=0
(b,c)	1		Add the edge(b,c) to the spanning tree	No_of_edges=1 Cost=1
(e,f)	2		Add the edge(e,f) to the spanning tree	No_of_edges=2 Cost=3
(a,b)	3		Add the edge(a,b) to the spanning tree	No_of_edges=3 Cost=6

(b,f)	4		Add the edge(b,f) to the spanning tree	No_of_edges=4 Cost=10
(c,f)	4		Reject the edge(c,f), because adding to the spanning tree forms a cycle	No_of_edges=4 Cost=10
(a,f)	5		Reject the edge(a,f), because adding to the spanning tree forms a cycle	No_of_edges=4 Cost=10
(d,f)	5		Add the edge(d,f) to the spanning tree	No_of_edges=5 Cost=15
Algorithm Stops as No of edges selected=5, which is one less than the vertices i.e,6-1=5				

Therefore , the Minimum Cost Spanning Tree is



Where,

Number of edges=5

Edges selected are (b,c),(e,f),(a,b),(b,f),(d,f)

Cost of MST=15