

Question 1 [15 marks]:

The costs for all the possible options to construct the roads for connecting a pair of cities is shown in the following table:

Pair of cities	Cost
(A, B)	2
(B, C)	3
(C, D)	2
(C, E)	7
(A, C)	4
(A, F)	3
(B, E)	5
(F, D)	6
(E, D)	7

Draw a graph to model the problem and then use Kruskal's algorithm to find the roads to be constructed such that all the cities are connected, and the total cost is minimum. You must show the sequence of edges added. when you apply the algorithm and the minimum cost for constructing all the roads.

1	A,B	2
2	B,C	3
3	C,D	2
4	A,F	3
5	B,E	5

Using Kruskal's Algorithm, we select the edges (A,B) (B,C) (C,D) (A,F) (B,E) for a minimum cost of $2+3+2+3+5=15$.

