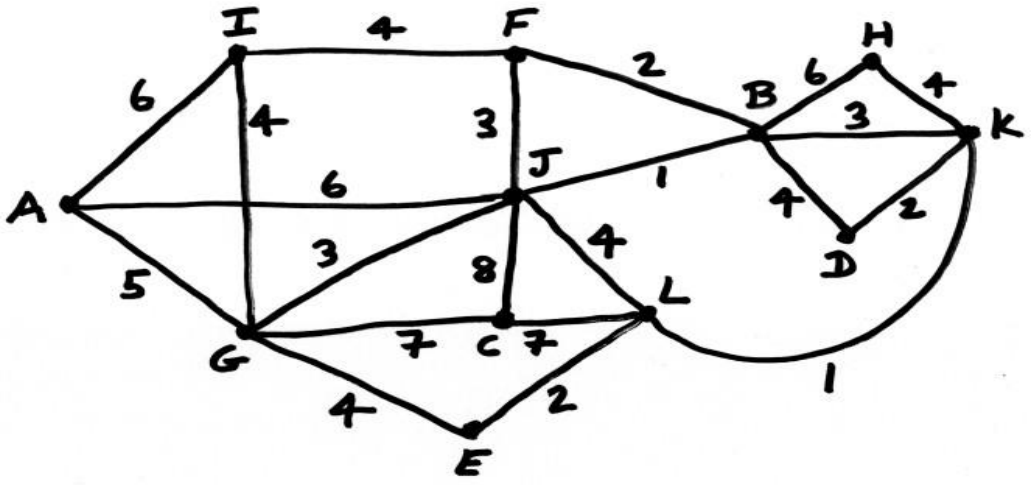
INT202 Complexity of Algorithms

1. Consider the weighted (undirected) graph below. (Edges {G, I} and {A, J} cross but there is not a vertex at their intersection.)



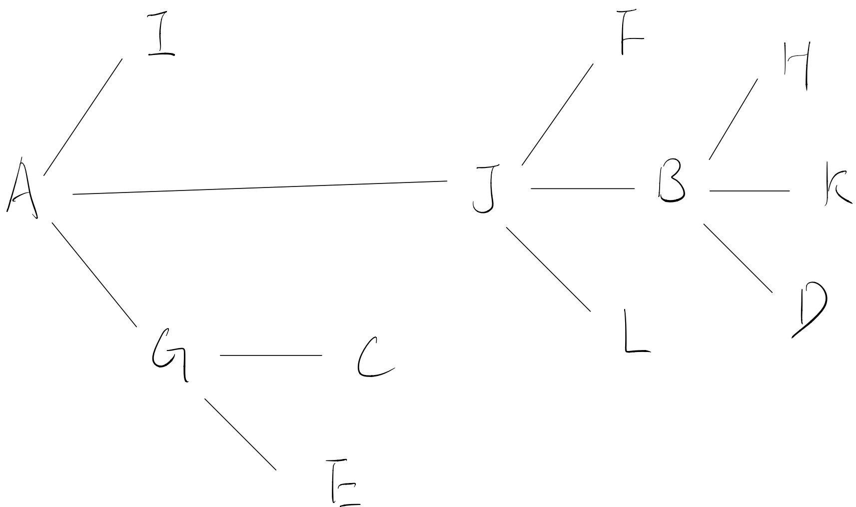
(a) Applying Dijkstra's algorithm to find shortest paths from vertex A to all other vertices in the graph. You should list the shortest distance array and draw the subgraph that contains only those edges used in the shortest paths.

(b) Applying Kruskal's algorithm to find a minimum spanning tree for the same weighted graph. Draw the subgraph consisting of the edges that comprise your minimum spanning tree, and indicate the smallest total weight.

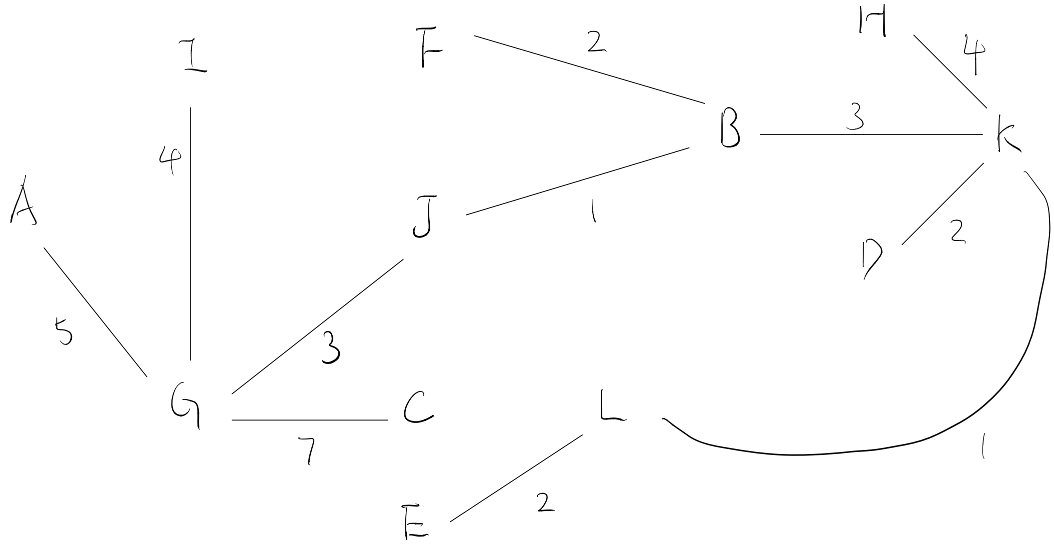
a),

A	B	C	D	E	F	G	H	I	J	K	L
0	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
0	∞	∞	∞	∞	∞	5	∞	6	6	∞	∞
0	∞	12	∞	9	∞	**5**	∞	6	6	∞	∞
0	∞	12	∞	9	10	**5**	∞	**6**	6	∞	∞
0	7	12	∞	9	9	**5**	∞	6	6	∞	10
0	**7**	12	11	9	9	**5**	13	6	6	10	10
0	**7**	12	11	**9**	9	**5**	13	6	6	10	10

0	7	12	11	9	9	5	13	6	6	10	10
0	7	12	11	9	9	5	13	6	6	10	10
0	7	12	11	9	9	5	13	6	6	10	10
0	7	12	11	9	9	5	13	6	6	10	10
0	7	12	11	9	9	5	13	6	6	10	10
0	7	12	11	9	9	5	13	6	6	10	10



b),



total: 5+4+3+7+2+1+2+4+3+2+1 = 34