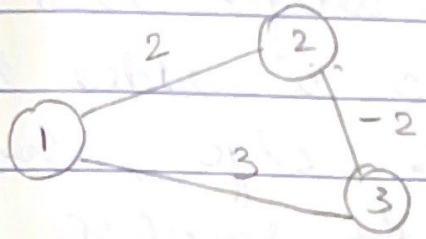
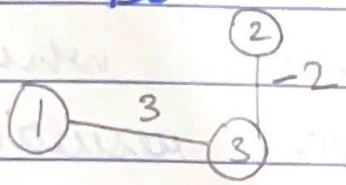
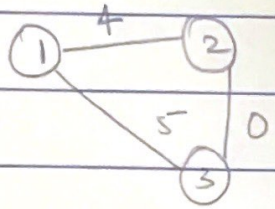
2). (a) let G1 be:



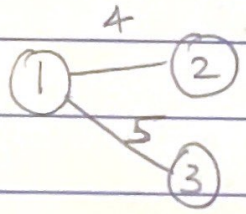
S would be:



if c = 2, G' will be:



S' will be:



$S \neq S'$ hence the vertices and edges making up S in G ~~do~~ do not make up a shortest path tree in G'.

2(b) Kruskal's algorithm adds edges to the tree smallest-weight first. If the same constant c is added to the weight of each edge, the order ~~of the~~ from the smallest to largest edge doesn't change. They get added in in the same order when finding MST of G' and hence resulting in the same edges and vertices being added.