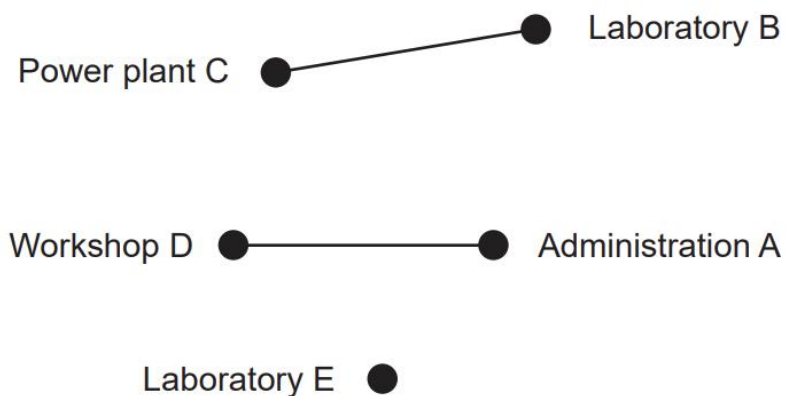


Question 2

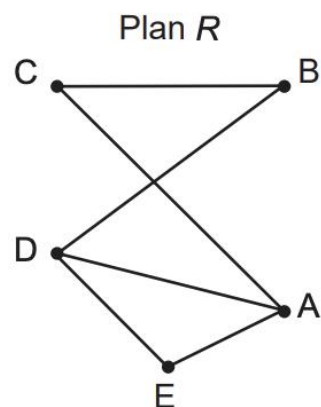
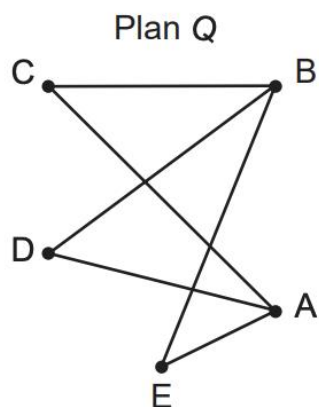
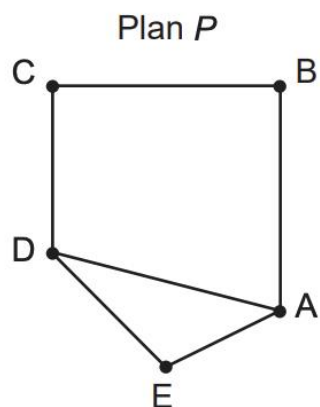
(8 marks)

A small research facility consists of five buildings with walkways represented by the edges in this network:



- (a) Determine the smallest number of edges (walkways) to be added to ensure that the network is
- (i) connected (1 mark)
 - (ii) complete (1 mark)
 - (iii) planar with 4 regions. (2 marks)

Three different plans for completing the network with the addition of four walkways are shown:



(b) State which, if any, of these plans has a graph that is

(i) bipartite

(1 mark)

(ii) Eulerian

(1 mark)

(iii) a Hamiltonian cycle.

(2 marks)