Question 3 **(11 marks)**

(a) A planar graph has five faces and five vertices, A, B, C, D and E.

(i) Determine the number of edges for this graph. (2 marks)

(ii) Draw the planar graph in the space below. (2 marks)

(iii) Determine a Hamiltonian cycle for the graph, giving your answer as a sequence of vertices. (1 mark)

(iv) Is the graph Eulerian, semi-Eulerian or neither? Justify your answer. (2 marks)

(b) (i) A simple connected graph contains five vertices. Determine the minimum and the maximum number of edges it contains. (2 marks)

(ii) A simple connected graph contains n vertices. Determine the minimum number of edges it contains. (1 mark)

(iii) What name is given to the simple connected graph with the maximum number of edges possible? (1 mark)