Question 6

(a) Let G be a graph and let v be a vertex of G. Say what is meant by the *degree* of v. [1]

(b) A graph is called k-regular if each of its vertices has degree k. Construct an example of:

(i) a 2-regular graph with 5 vertices; [2]

(ii) a 3-regular graph with 6 vertices. [2]

(c) (i) State, without proving, a result connecting the degrees of the vertices of a graph G with the number of its edges. [1]

(ii) Use this result to find the number of edges of a 3-regular graph with 10 vertices. [2]

(iii) Explain why it is not possible to construct a 3-regular graph with 9 vertices. [2]