Graph Theory – Problem Sheet I

August 8, 2024

Exercises from Text :

1. 1.1.2, 1.1.3

2. 1.2.1 to 1.2.8 , 1.2.11

3. 1.3.1 and 1.3.2

4. 1.4.1 and 1.4.2

5. 1.5.1 to 1.5.4

1. Define the complement of a graph G denoted by G^c such that $uv \in E(G)$ iff $uv \notin E(G^c)$ and $V(G) = V(G^c)$.

   - Show that the complement of a bipartite graph need not be bipartite.
   - A graph is called self complementary if it is isomorphic to its complement. Find a self complementary graph of order 4.
   - Find the number of vertices of G such that G is self-complementary.

2. Sketch all non-isomorphic graphs of order 5.

3. Let G be a simple graph. Show that $|E(G)| = \binom{|V(G)|}{2}$ iff G is complete.