Q 1: Give the adjacency matrix for each of the following graphs, and draw those graphs.

G1: $V = \{1, 2, 3, 4, 5, 6\}$ and
$E = \{\langle 1, 2 \rangle, \langle 1, 3 \rangle, \langle 1, 4 \rangle, \langle 2, 5 \rangle, \langle 2, 6 \rangle, \langle 3, 5 \rangle, \langle 3, 6 \rangle, \langle 4, 5 \rangle, \langle 4, 6 \rangle\}$

G2: $V = \{1, 2, 3, 4, 5\}$ and
$E = \{\langle 1, 2 \rangle, \langle 1, 4 \rangle, \langle 2, 3 \rangle, \langle 2, 4 \rangle, \langle 2, 5 \rangle, \langle 3, 4 \rangle, \langle 3, 5 \rangle\}$

For the graph G1, the neighborhood of vertex 1, N(1) = _____

the degree of vertex 1 is _____

Draw the subgraph induced by the vertices {1, 2, 4, 5}

Draw the line graph for G1, L(G1)

Q 2: Consider the following two graphs:
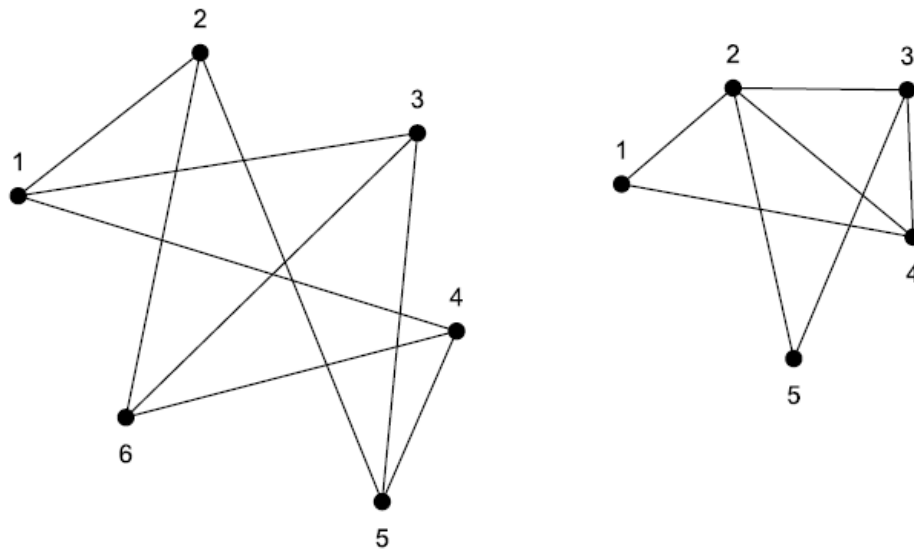
G1: $V = \{1, 2, 3, 4, 5, 6\}$ and
$E = \{\langle 1, 2 \rangle, \langle 1, 3 \rangle, \langle 1, 4 \rangle, \langle 2, 5 \rangle, \langle 2, 6 \rangle, \langle 3, 5 \rangle, \langle 3, 6 \rangle, \langle 4, 5 \rangle, \langle 4, 6 \rangle\}$

G2: $V = \{1, 2, 3, 4, 5\}$ and
$E = \{\langle 1, 2 \rangle, \langle 1, 4 \rangle, \langle 2, 3 \rangle, \langle 2, 4 \rangle, \langle 2, 5 \rangle, \langle 3, 4 \rangle, \langle 3, 5 \rangle\}$

For each graph, check whether it is (1) bipartite, (2) complete, (3) complete bipartite, (4) complete nonbaprtite.

Q 3: Draw the complement of the following two graphs:

Q 36: Construct two nonisomorphic simple graphs with six vertices with degrees 1, 1, 2, 2, 3, and 3. What is the number of edges in each graph?

Q 45: Test whether $[5, 4, 3, 3, 3, 3, 3, 2]$ is graphic. If it is graphic, draw a simple graph with this sequence as the degree sequence.

Q 46: Test whether $[6, 6, 5, 4, 3, 3, 1]$ is graphic.

Give an example of a complete graph with 5 vertices.

Give an example of a 3-regular graph.

Give an example of a bipartite graph with 6 vertices

Give 2 examples of complete bipartite graphs with 5 vertices

Q 51: Construct a graph for which $\kappa(G) < \lambda(G) < \min\{\delta(v)|v \in V(G)\}$ is strict.