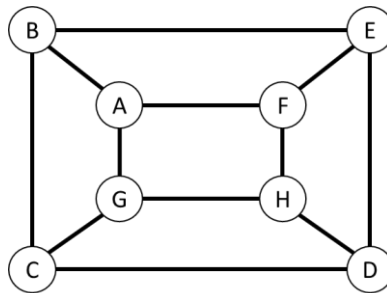


Question 1

Consider the following figure, Write down:

- (i) the set of nodes $V(G)$ and edges $E(G)$
- (ii) the order and size of graph
- (iii) the neighborhood of each node
- (iv) the degree of each node
- (v) the total degree of graph



Question 2

Consider the following relationship:

- (i) John likes Joan, Jean, and Jane;
- (ii) Joe likes Jane and Joan;
- (iii) Jean and Joan like each other.

Draw a digraph illustrating these relationships between John, Joan, Jean, Jane, and Joe, and Write down the number of vertices, edges, and the degree of each vertex

Question 3

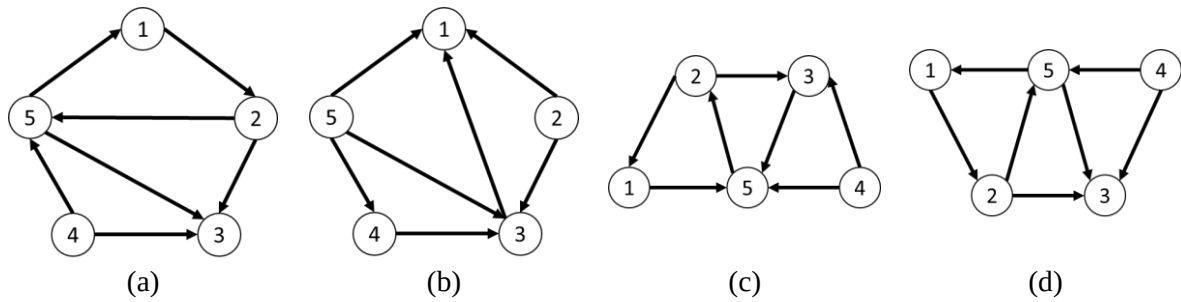
Draw the following graphs:

- (i) the complete graph K_6 ;
- (ii) the complete bipartite graph $K_{2,4}$

And determine the number of edges on each graph.

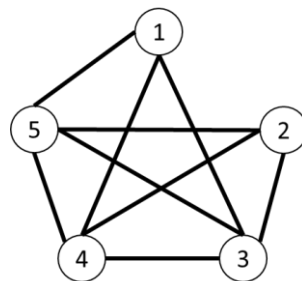
Question 4

Identify which two of the following graphs are isomorphic, and give the justification(s)



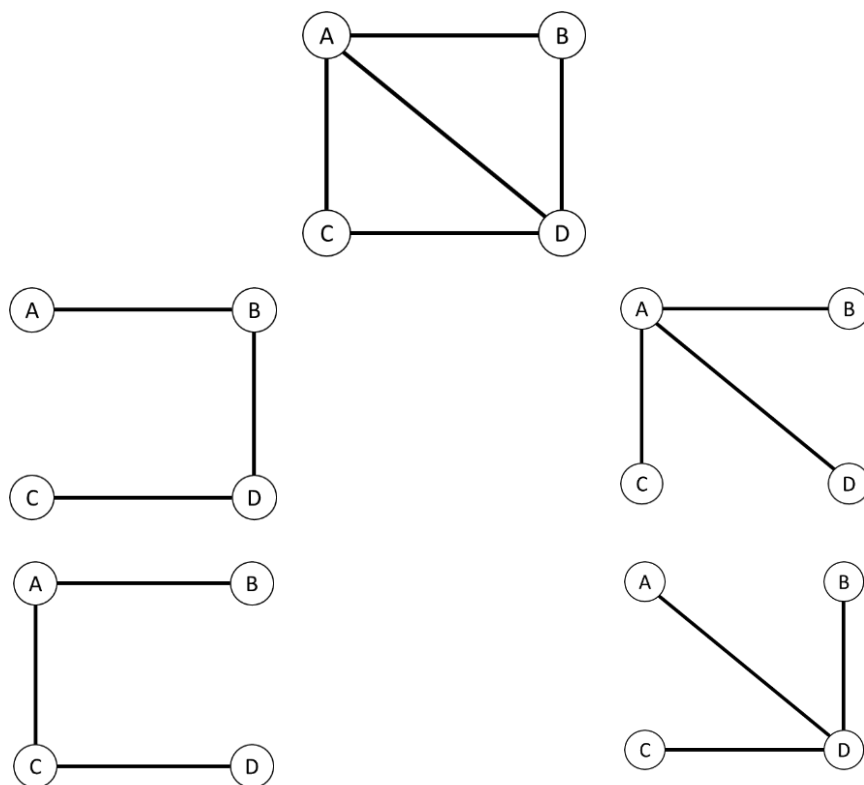
Question 5

Show how the graph in the following figure can be drawn in the plane without crossings



Question 6

Draw all the spanning trees in the following graph (hints: there are totally 8 spanning trees)



Question 7

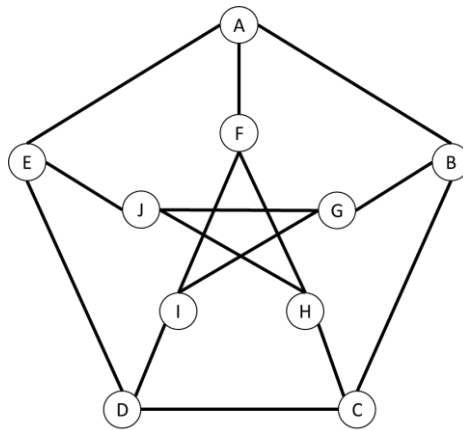
With 5 vertices and 8 edges, draw:

- (i) a simple graph;
- (ii) a general graph with no loops;
- (iii) a general graph with no multiple edges

Question 8

In the Petersen graph shown in follow, find:

- (i) a trail of length 5;
- (ii) a path of length 9;
- (iii) cycles of lengths 5, 6, 8, and 9;



Question 9

Draw the adjacency matrices for the complete bipartite graph $K_{3,4}$