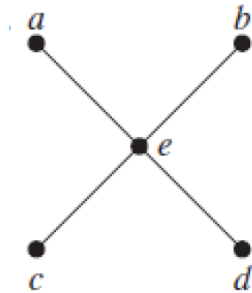


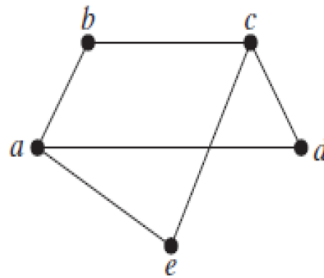
15B11CI212 – Theoretical Foundations of Computer Science

Tutorial 10 Graph Theory

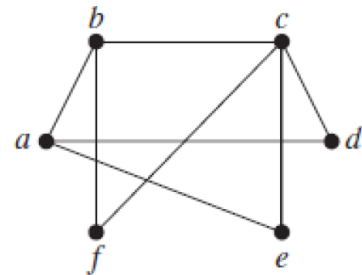
1. Draw a graph G having 3 vertices and 3 edges excluding the parallel edges and loops.
How many simple graphs are possible from the graph G and draw all possible graphs?
2. Determine whether the graph is bipartite or not.



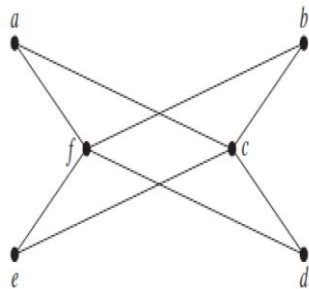
(a)



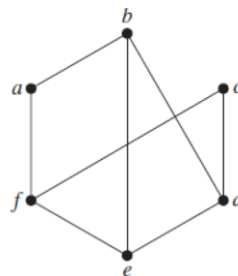
(b)



(c)

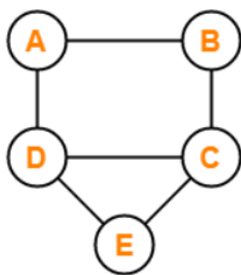


(d)

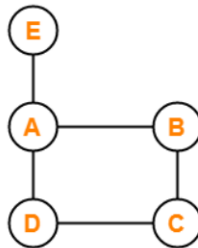


(e)

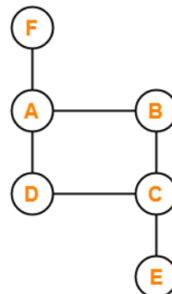
3. Determine the Hamiltonian path and Hamiltonian circuit of the following graphs



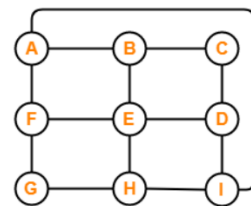
(a)



(b)

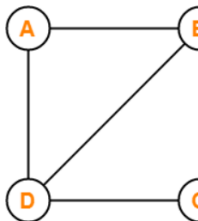


(c)

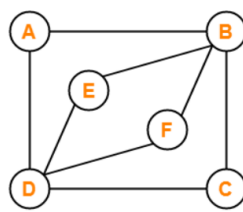


(d)

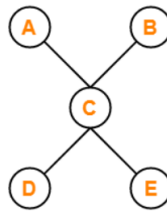
4. Determine the Euler path and Euler circuit of the following graphs



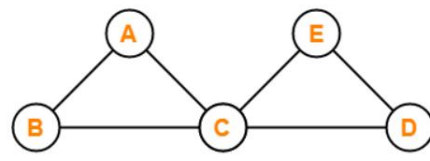
(a)



(b)

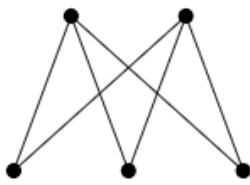


(c)

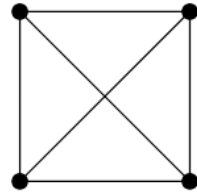


(d)

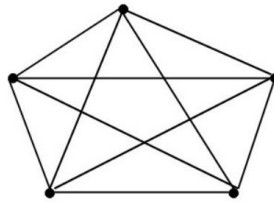
5. Draw Planar representations of the following graphs:



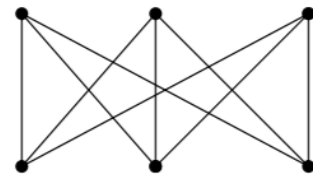
(a)



(b)

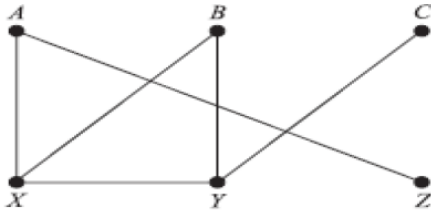


(c)



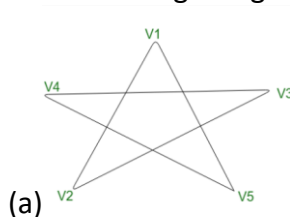
(d)

6. Let G be the graph. Find:

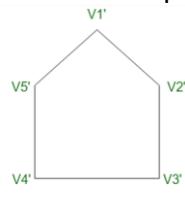


- all simple paths from A to C ;
- $G - Y$;
- All cycles;
- Subgraph H generated by $V = \{B, C, X, Y\}$;
- All cut points;
- All bridges.

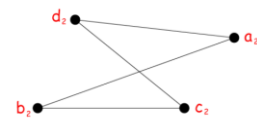
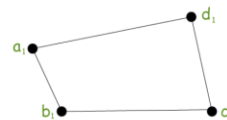
7. Find out the given graphs are isomorphic or not?



(a)



(b)



- A zoo wants to set up natural habitats in which to exhibit its animals. Unfortunately, some animals will eat some of others when given the opportunity. How can a graph model and a coloring be used to determine the number of different habitats needed and the placement of animals in these habitats?
- Find out the chromatic numbers for the graphs mentioned in question 4.
- The mathematics department has six committees, each meeting once a month. How many different meeting times must be used to ensure that no member is scheduled to attend two meetings at the same time if the committees are
 - $C_1 = \{\text{Arlinghaus, Brand, Zaslavsky}\}$,
 - $C_2 = \{\text{Brand, Lee, Rosen}\}$,
 - $C_3 = \{\text{Arlinghaus, Rosen, Zaslavsky}\}$,
 - $C_4 = \{\text{Lee, Rosen, Zaslavsky}\}$,
 - $C_5 = \{\text{Arlinghaus, Brand}\}$,
 - $C_6 = \{\text{Brand, Rosen, Zaslavsky}\}$