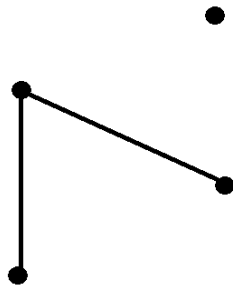
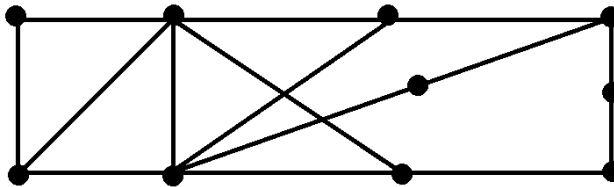


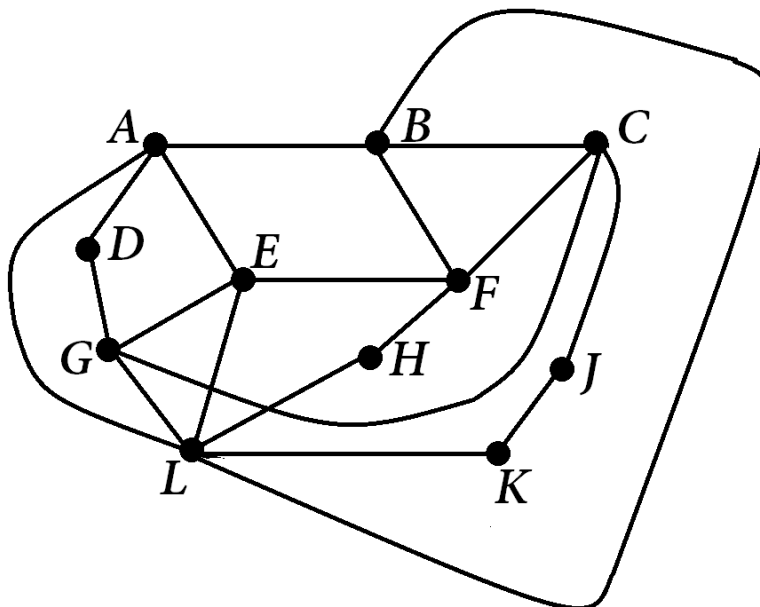
1. Write down the adjacency matrix of the following graph and calculate the eigenvalues of the graph.



2. What are the eigenvalues of  $K_{3,3}$ ?
3. Let  $G$  be the following graph. Determine whether or not  $G$  is Hamiltonian.



4. Let  $G$  be the following graph.

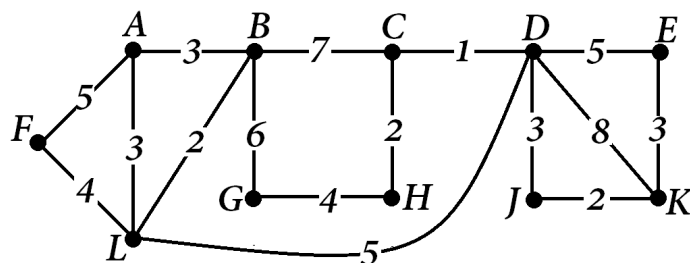


- (i) Partition the edge set into cycles and hence construct an Eulerian trail in  $G$
- (ii) Show that  $G$  is Hamiltonian

$$S_1 = \{a, c\}, S_2 = \{a, f\}, S_3 = \{a, b\}, S_4 = \{a, c, e, f\}, S_5 = \{b, d\}, S_6 = \{d, e\}$$

6. State Prim's algorithm.

(i)



student	1	2	3	4	5	6	7	8	9
modules	<i>ABDG</i>	<i>BCD</i>	<i>BDF</i>	<i>GFB</i>	<i>ADF</i>	<i>BCF</i>	<i>CEB</i>	<i>FED</i>	<i>EG</i>

8. Find and draw a graph for which the largest clique is  $K_3$  which has chromatic number strictly greater than 3.