

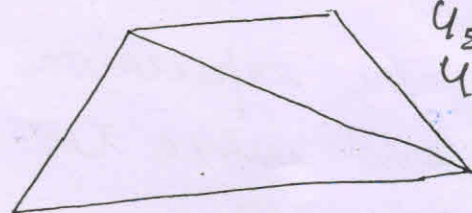
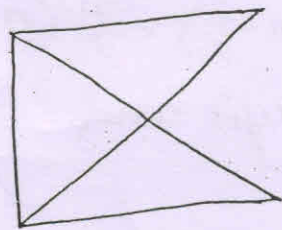
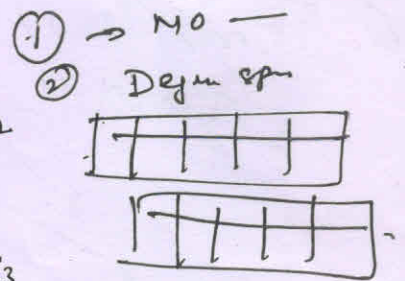
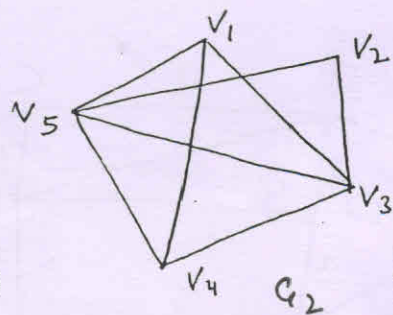
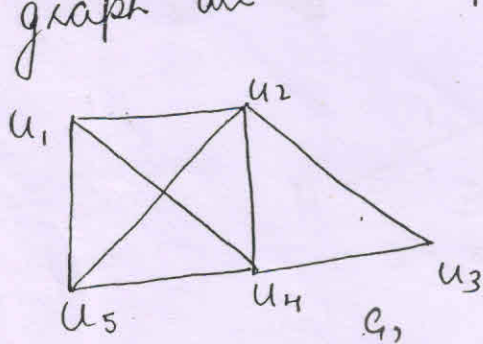
# Graph Theory

1. If all the vertices of an undirected graph are each of odd degree  $k$ , show that number of edges of graph is a multiple of  $k$ .

2. For each of the following degree sequence, find if there exists a graph. Draw it

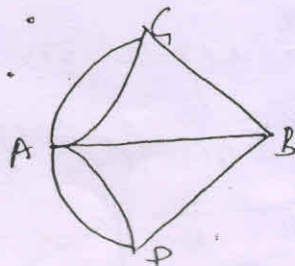
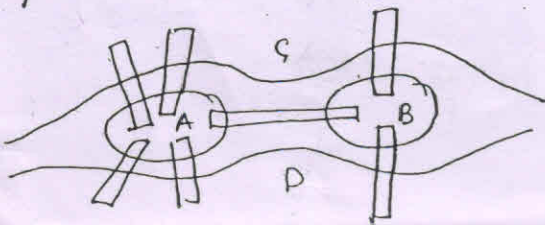
- (a) 4, 4, 4, 3, 2
- (b) 5, 5, 4, 3, 2, 1
- (c) 3, 3, 3, 3, 2
- (d) ~~3, 3, 3, 3, 2~~

3. Determine whether the following pairs of graph are isomorphic or not

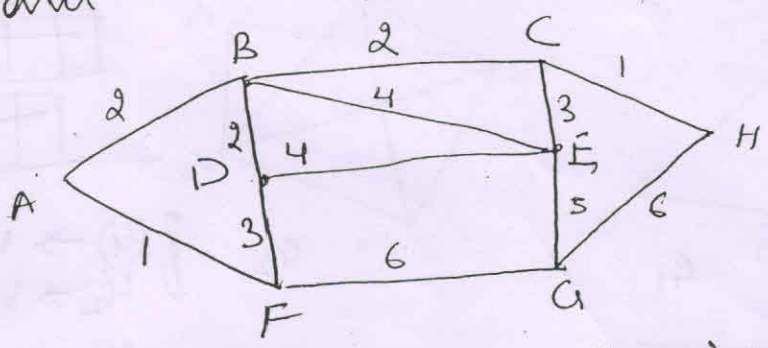


$u_1 \rightarrow v_1$   
 $u_2 \rightarrow v_3$   
 $u_5 \rightarrow v_4$   
 $u_4 \rightarrow v_5$   
 $u_3 \rightarrow v_2$

4. Explain Konigsberg problem. Does it have a solution



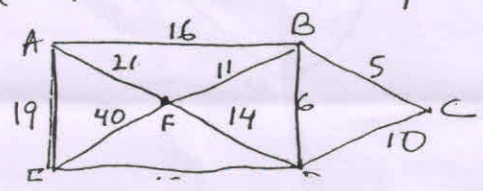
5. Give an example of each.
1. an Eulerian circuit that is also a Hamiltonian circuit
  2. an Eulerian circuit and a Hamiltonian circuit that are distinct
  3. an Euler circuit, but not a Hamiltonian circuit
  4. a Hamiltonian circuit, but not an Euler circuit.
  5. neither an Euler circuit nor a Hamiltonian circuit
6. Find shortest distance between A and H



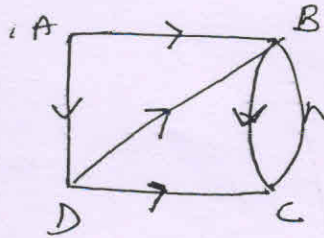
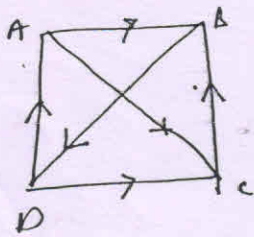
7. Represent the expression  $((a-c) * d) / (a + (b-d))$  as tree and write the prefix and postfix expression.

8. Find the value of the ~~postfix~~<sup>prefix</sup> expression  $+ - \uparrow 32 \uparrow 23 / 8 - 42$

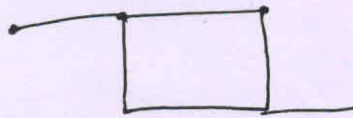
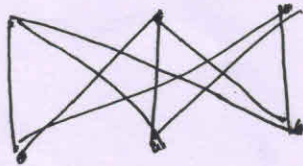
9. Find the minimum spanning tree



10. Find which of the following is strongly, weakly or unilaterally connected.



11. Find a Hamiltonian path or a Hamiltonian circuit if it exists in each. If it does not exist, why?



12.