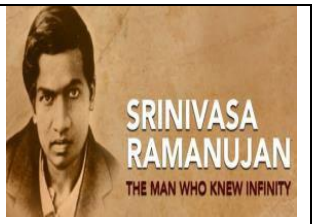
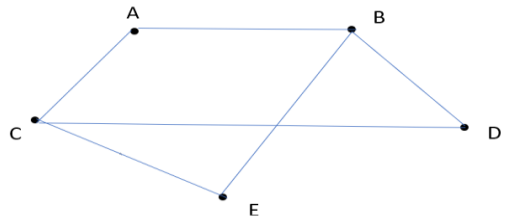
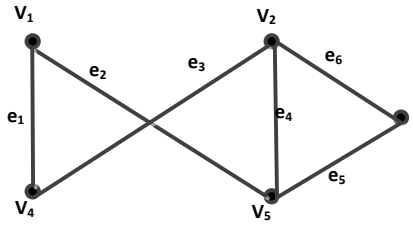
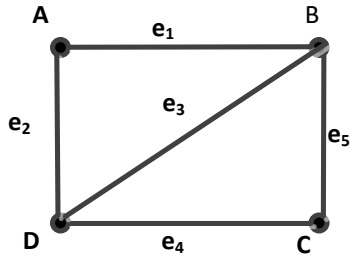
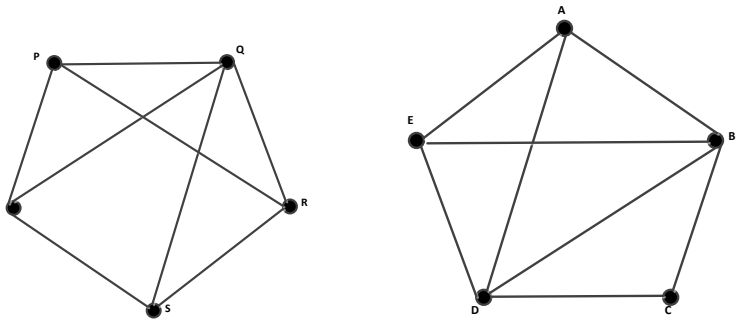
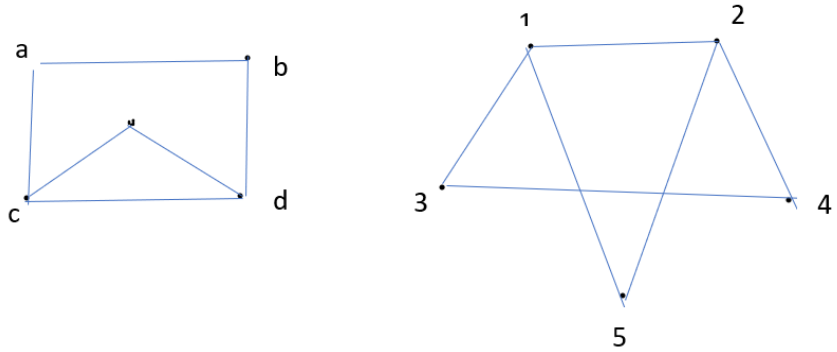
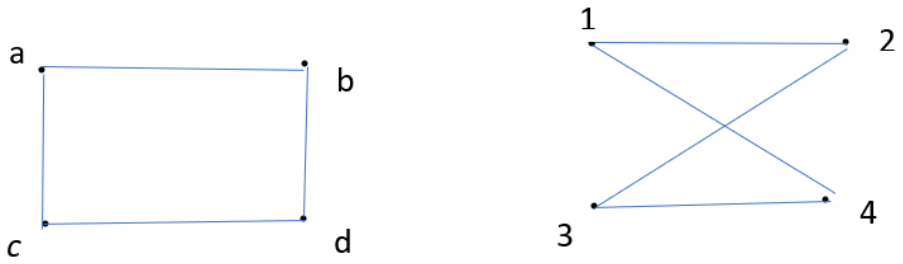
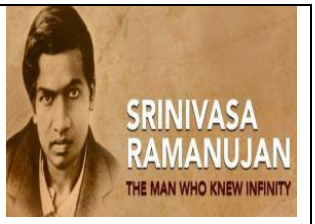
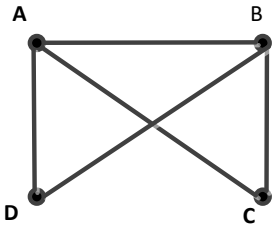
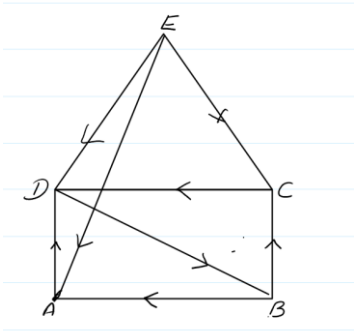
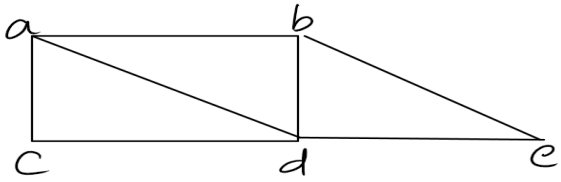
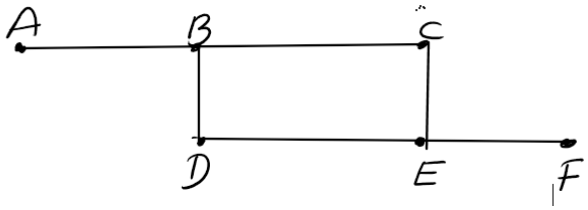
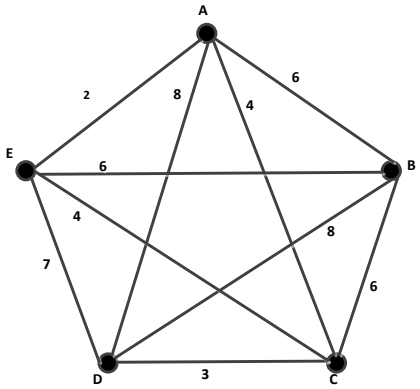
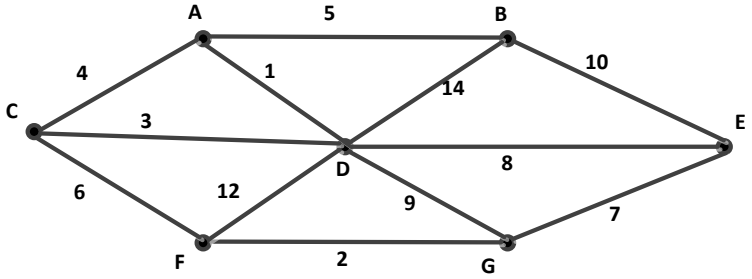
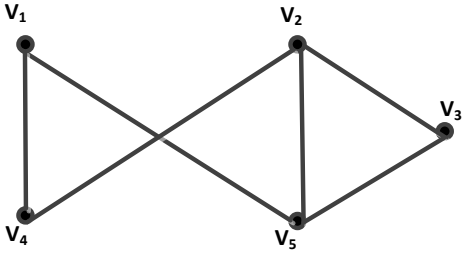
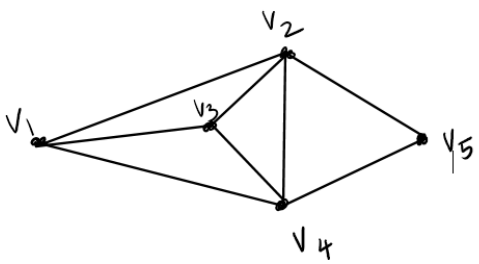
	SRM Institute of Science and Technology Kattankulathur	
	DEPARTMENT OF MATHEMATICS	
	18MAB302T Discrete Mathematics for Engineers	
	UNIT - V: Graph Theory TUTORIAL SHEET-1	

Sl.No.	Questions	Answer
	Part –A	
1	Find the number of edges of an undirected graph having degree sequence 2, 4, 4, 3, 4, 1. Verify also the Handshaking theorem.	No. of Edges – 9 Theorem true
2	Find a graph if exists for the following degree sequence. 4, 4, 4, 3, 2	Does not exist
3	Find the maximum number of possible edges in a bipartite graph with n vertices.	$n^2/4$
4.	If all the vertices of an undirected graph are each of odd degree k, show that the number of edges of the graph is a multiple of k.	
5.	Check whether the graph is Bipartite or not. If a graph is bipartite, state if it is completely bipartite 	Bipartite graph Yes
	Part – B	
1.	Find the incidence and adjacent matrices for the graph given below 	$I_{ij} = \begin{pmatrix} 1 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 1 & 0 \end{pmatrix}$ $A_{ij} = \begin{pmatrix} 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 0 & 1 \\ 1 & 1 & 0 & 0 & 0 \\ 1 & 1 & 1 & 0 & 0 \end{pmatrix}$

2.	Find the incidence and adjacent matrices for the graph given below 	$I_{ij} = \begin{pmatrix} 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 & 0 \end{pmatrix}$ $A_{ij} = \begin{pmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{pmatrix}$
3.	Check whether the following graphs are isomorphic or not. Explain. 	Answer: Not isomorphic
4.	Check whether the following graphs are isomorphic or not. Explain. 	Answer: isomorphic
5.	Prove that the following graph are isomorphic using adjacency matrices 	

	SRM Institute of Science and Technology Kattankulathur	
	DEPARTMENT OF MATHEMATICS	
	18MAB302T Discrete Mathematics for Engineers	
	UNIT - V: Graph Theory **TUTORIAL SHEET-2**	

Sl.No.	Questions	Answer
	Part – A	
1	Give an example of a graph which contains (i) An Eulerian circuit that is also a Hamiltonian circuit (ii) An Eulerian circuit, but not a Hamiltonian circuit (iii) A Hamiltonian circuit nor an Eulerian circuit (iv) Neither an Eulerian circuit nor a Hamiltonian circuit	
2	Draw all the spanning trees of the graph G 	Draw the possible trees
3.	Find the in-degree and out degree of each vertex of the directed graph. Also verify that the sum of the in degrees or the out degrees equals the number of edges. 	
4.	Check whether the graph have an Euler Path and Euler Circuit 	a-c-d-e-b-d-a-b - Euler Path it is not an Euler Circuit
5.	Find a Hamiltonian Path and Hamiltonian Circuit for the Graph Given below	Neither Hamiltonian Path nor Hamiltonian Circuit

		
	Part – B	
1.	Find the minimum spanning tree for the weighted graph using Kruskal's algorithm 	Minimum Weight - 15
2.	Find the minimum spanning tree for the weighted graph using Kruskal's algorithm 	Minimum Weight - 24
3.	Prove that a tree with n vertices has (n-1) edges.	
4.	Find the chromatic number for the given graph 	Chromatic no. 3
5.	Find the Chromatic number for the given graph 	Chromatic no. 4
