Discrete Mathematical Structures
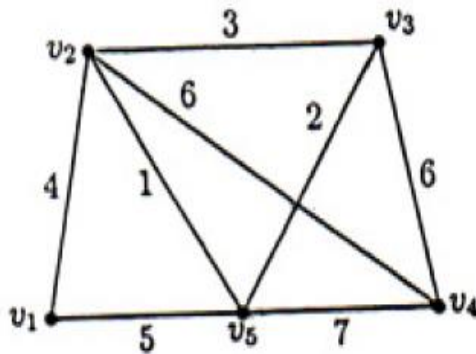
(Question Bank)

UNIT – III					
1		Write the rules for constructing Hamiltonian paths and cycles.	L3	CO3	[6M]
2		Explain about Walk and types of walk with suitable example	L2	CO3	[6M]
3		Write the difference between Hamiltonian graphs and Euler graphs.	L3	CO3	[6M]
4		Explain about Isomorphism graphs with suitable example.	L2	CO3	[6M]
5		Write short notes on Trail, Path, Cycle with an example	L3	CO3	[6M]
6		Explain about Euler Graphs with an example	L2	CO3	[6M]
7		Explain about Hamiltonian Graphs with an example			

UNIT – IV					
1		Explain Kruskal's algorithm to find minimal spanning tree of the graph with suitable example	L2	CO4	[12M]
2		Explain Prim's algorithm to find minimal spanning tree of the graph with suitable example	L2	CO4	[12M]
3	a)	Explain planar graph with suitable example.	L2	CO4	[6M]
	b)	Write a short notes on graph colouring with an example	L2	CO4	[6M]
4		Explain depth-first search and breadth-first search to find the spanning tree with suitable examples	L2	CO4	[12M]
5	a)	Find Minimum spanning tree for a graph in Fig below using Kruskal's algorithm.	L2	CO4	[6M]
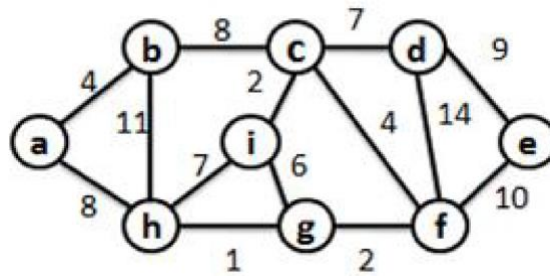
	b)	Show that the complete graph with 5 vertices is non planar?	L2	CO4	[6M]
6	a)	Write a short notes on chromatic number with suitable example	L	CO4	[6M]
	b)	With suitable examples, explain the terms Tree, Spanning tree.	L2	CO4	[6M]
8		Using Prim's algorithm, find a minimal spanning tree for the weighted graph shown below:	L2	CO4	[6M]

	b)	With suitable examples, explain the terms Tree, Spanning tree.	L2	CO4	[6M]
9	a)	Write the Kruskal's algorithm and find minimal spanning tree of the weighted graph shown below	L3	CO4	[6M]

	b)	Show that the complete graph with 5 vertices is non planar?	L2	CO4	[6M]

UNIT – V

1	a)	Solve $a_n = a_{n-1} + f(n)$ for $n >= 1$ by substitution.	L3	CO5	[6M]
	b)	Solve $a_n = a_{n-1} + 2a_{n-2}$, initial conditions $a_0 = 0$, $a_1 = 1$.	L3	CO5	[6M]
2	a)	Solve the recurrence relation of Fibonacci sequence of numbers $f_n=f_{n-1}+f_{n-2}$,$n>=2$ where initial conditions $f_0=0,f_1=1$	L3	CO5	[6M]
	b)	What is recurrence relation? Find first five terms of sequence $a_n = a^2_{n-1}$,$a1=2$	L1	CO5	[6M]
3	a)	Solve $a_n = 8a_{n-1} - 16a_{n-2}$, initial conditions $a_0 = 16$, $a_1 = 80$.	L3	CO5	[6M]
	b)	Solve $a_n = a_{n-1} + f(n)$ for $n >= 1$ by substitution.	L3	CO5	[6M]
4	a)	Use generating functions to solve the recurrence relation $a_n=3a_{n-1}+2$, $n>=1$ with $a_0=1$	L3	CO5	[6M]

	b)	What is recurrence relation? Find first five terms of sequence $a_n = na_{n-1} + n^2 a_{n-2}$, $a_0=1$, $a_1=1$	L1	CO5	[6M]
5	a)	What is recurrence relation? Solve $a_n = a_{n-1} + n$ where $a_0=1$ by substitution.	L1	CO5	[6M]
	b)	What is recurrence relation? Find first five terms of sequence $a_n = a^2_{n-1}$,$a1=2$	L3	CO5	[6M]
6	a)	Let $a_n = na_{n-1} + n^2 a_{n-2}$ where $a_0 =1, a_1 =1$. find a_2 ,a_3 ,a_4 ,a_5	L3	CO5	[6M]
	b)	What is recurrence relation? Solve $a_n = a_{n-1} + n$ where $a_0=1$ by substitution.	L1	CO5	[6M]
7	a)	What is recurrence relation? Find first five terms of sequence $a_n = na_{n-1} + n^2 a_{n-2}$, $a0=1$, $a1=1$	L1	CO5	[6M]
	b)	Solve the recurrence relation of Fibonacci sequence of numbers $f_n = f_{n-1} + f_{n-2}$,$n>=2$ where initial conditions $f_0=0, f_1=1$	L3	CO5	[6M]
8	a)	Use generating functions to solve the recurrence relation $a_n = 3a_{n-1}+2$, $n>=1$ with $a_0=1$	L3	CO5	[6M]
	b)	Solve $a_n = a_{n-1} + f (n)$ for $n>= 1$ by substitution.	L3	CO5	[6M]
9		What is recurrence relation? Solve $a_{n+2} +3 a_{n+1} + 2a_n = 3^n$ where $n>=0$, initial condition are $a_0=0$, $a_1=1$	L3	CO5	[12M]