

[M19 IT 1112]

**I M. Tech I Semester (R19) Regular Examinations
 ADVANCED GRAPH THEORY
 Department of Information Technology
 MODEL QUESTION PAPER**

TIME: 3 Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**

All questions carry equal marks

			CO	KL	M
		UNIT - I			
1.	a).	Analyze the maximum number of edges in a simple graph with n vertices is $n(n-1)/2$.	1	4	8
	b).	Prove that if a graph has exactly two vertices of odd degree, there must be path joining these two vertices.	1	5	7
		OR			
2.	a).	Identify Hamiltonian path as spanning tree	1	3	8
	b).	List some of the properties of tree.	1	4	7
		UNIT - II			
3.	a).	Distinguish max-flow min-cut theorem	2	4	7
	b).	Prove that in any tree, there are at least two pendant vertices	1	5	8
		OR			
4.	a).	Compare Fundamental cut set and Fundamental circuit in a graph.	1	4	7
	b).	List some types of digraph with suitable example	1	4	8
		UNIT - III			
5.	a).	Prove that every connected graph has at least one spanning tree	2	5	8
	b).	Distinguish Tutte's f -factor theorem with example	2	4	7
		OR			
6.	a).	Identify problems in Euler digraph	2	3	8
	b).	Distinguish Turen's with Example.	2	4	7
		UNIT - IV			
7.	a).	Solve the recurrence relation. $6a_n - 7a_{n-1} = 0, n \geq 1, a_3 = 343$.	3	3	8
	b).	Analyze Traveling Salesman Problem	3	4	7
		OR			
8.	a).	Analyze Greedy algorithm with example	3	4	7
	b).	Prove that a graph of n vertices is a complete graph if its chromatic polynomial is $P_n(\lambda) = \lambda(\lambda-1)(\lambda-2)\dots(\lambda-n+1)$	3	5	8
		UNIT - V			
9.	a).	Compare direct paths and cycle	3	4	7
	b).	Distinguish max flow min cut theorem	3	4	8
		OR			
10.	a).	Classify Brooks theorem with example	3	4	8
	b).	Identify greedy algorithm	3	3	7