RAMAIAH
Institute of Technology

MOBILES ARE BANNED

USN: 1 M S

DEPARTMENT OF MATHEMATICS

Sub Code:	MAOE04	Sub:	Applied Graph Theory	Test:	01
Time :	11am to 12pm	Term:	23.03.2022 to 06.07.2022	Marks:	30
Date:	14.05.2022	Semester:	VI	Section:	Open elective

Note: Answer any **TWO** full questions. Each main question carries 15 marks

Q.No.		Questions	Blooms Level	CO's	Marks
1.	(a)	Define fusion of two vertices with an example.	L1	CO1	2
	(b)	Show that $K_{3,3}$ is non-planar.	L2	CO2	3
	(c)	From the given graph G, determine the following. i) Complement of G ii) Hamiltonian path iii) Walk of length 6 iv) All possible circuits v) G-u_1	L4	CO1	5
	(d)	Write Kruskal's algorithm to determine the minimal spanning tree and hence determine the same from the following graph.	L3	CO2	5
2.	(a)	If a tree has 2030 vertices, then find the sum of the degrees of all the vertices.	L2	CO1	2
	(b)	Define fundamental cut-set with an example.	L1	CO2	3
	(c)	Define Hamiltonian graph with an example and hence discuss the seating arrangement problem.	L3	CO1	5
	(d)	Show with an example that ring sum of two cut-sets is either a new cut-set or edge disjoint union of cut-sets.	L4	CO2	5
3.	(a)	Define arbitrary traceable graphs.	L1	CO1	2
	(b)	Give an example of a graph whose vertex connectivity is two, with proper justification.	L2	CO2	3
	(c)	Prove that every tree has either one or two centres.	L2	CO1	5
	(d)	Define each of the following with example i) Fundamental circuit ii) degree of region of a planar graph iii) cut-edge iv) Rank and nullity of a graph	L2	CO2	5