MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

MLRS

II B.Tech II Sem Supply End Examination, July 2022
Discrete Mathematics
(CSE & IT)

Time: 3 Hours.　　　　　　　　　　　　　　Max. Marks: 70

Note: 1. Question paper consists: Part-A and Part-B.
　　　　2. In Part – A, answer all questions which carries 20 marks.
　　　　3. In Part – B, answer any one question from each unit.
　　　　Each question carries 10 marks and may have a, b as sub questions.

PART- A
(10*2 Marks = 20 Marks)

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1.	a)	List the applications of propositional logic	2M	CO1	BL1
	b)	Write Converse, Opposite for the statement "If 2+2=8 then sun rises in the east"	2M	CO1	BL1
	c)	Define Function	2M	CO2	BL1
	d)	Represent the following relation R on the set X={1,2,3} in matrix form and graph form R = {(1,1),(2,2),(3,3),(2,3),(3,1),(1,3)}	2M	CO2	BL3
	e)	Define the characteristics of an algorithm.	2M	CO3	BL1
	f)	Define structural Induction.	2M	CO3	BL1
	g)	Define Baye's theorem	2M	CO4	BL1
	h)	Write the generating function for the sequence 1, 2, 3, 4, 5……..	2M	CO4	BL2
	i)	Differentiate Tree and Graph	2M	CO5	BL2
	j)	Define Euler formula for connected planar graph.	2M	CO5	BL1

PART- B
(10*5 Marks = 50 Marks)

2	a)	Construct truth table for $[(p \lor q) \land (\sim r)] \leftrightarrow q$	5M	CO1	BL3
	b)	Show that $P \rightarrow (Q \rightarrow R)$ is logically equivalent to $(P \land Q) \rightarrow R$	5M	CO1	BL3

OR

3		Show that $R \land (P \lor Q)$ is valid conclusion from set of premises $P \lor Q$, $Q \rightarrow R$, $P \rightarrow M$ and $\sim M$.	10M	CO1	BL3

4	a)	Let X = {1,2,3,4,5,6} and relation R on set X is defined as R = {(a,b)	a-b is divisible by 3} . Show that R is equivalence relation	5M	CO2	BL3
	b)	Give the list of relations which are partial order relations. Justify your answer.	5M	CO2	BL3

OR

5		For the relation R on the set { 1,2,3,4 }, determine whether it is reflexive , irreflexive, symmetric , asymmetric, anti-symmetric and transitive or not. Justify your answer. R= ={(1,3),(1,4),(2,3),(2,4),(3,1),(3,4)}	10M	CO2	BL3

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6	a)	Briefly discuss about the complexity of algorithms will be calculated	5M	CO3	BL2
	b)	Differentiate recursive algorithms with non-recursive algorithms	5M	CO3	BL2

OR

7	Explain the concept of mathematical induction with an example.	10M	CO3	BL2

8 a) A certain computer centre employs 100 computer programmers. Of these 45 can program in FORTRAN, 28 in PASCAL and 23 programs in both the languages. How many can program neither of these 2 languages. — 5M CO4 BL3

   b) Explain the concept of divide and conquer with an example. — 5M CO4 BL2

OR

9 Solve the following linear recurrence relation : $a_n - 3 a_{n-1} - 4 a_{n-2} = 0$ for n ≥ 2, $a_0 = 1$ and $a_1 = 1$ — 10M CO4 BL3

10 a) What is Chromatic number? Apply an algorithm to find Chromatic number of the following graph. — 5M CO5 BL3
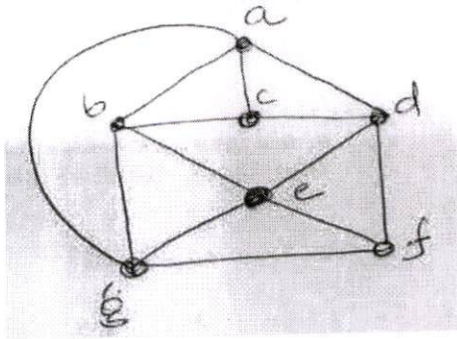
   b) What are different tree traversal methods? Apply all the methods on the following Tree. — 5M CO5 BL3
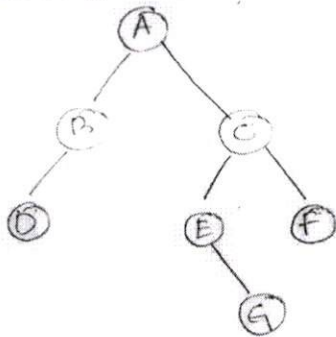
OR

11 Define Graph Isomorphism. Analyze the following two graphs G1 and G2 are isomorphic or not. — 10M CO5 BL3

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