Hall Ticket No.: | | | | | | | | | | |

SRIT R20

SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

(AUTONOMOUS)

II B. Tech II Sem – Semester End Examinations – Regular – Aug 2022

DISCRETE MATHEMATICS

[R204GA05401]

(Common to CSE, CSD & CSM)

Time: 3 hours **Max. Marks: 60**

PART-A

(Compulsory Question)

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1		Answer the following: (5 X 02 = 10 Marks)	
	a)	Define law of duality.	
	b)	What is composition of function?	
	c)	Write the properties of integers	
	d)	Write the basic of counting principles.	
	e)	Define graph coloring. Give an example.	

PART-B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT-1

2	a)	Explain the inference theory for predicate calculus.	**[5M]**
	b)	Explain disjunctive normal Form.	**[5M]**
		(OR)	
3	a)	Obtain the principal conjunctive normal form of the formula S given by $(\neg P \rightarrow R) \wedge (Q \leftrightarrow P)$.	**[5M]**
	b)	Show that $(R \vee S)$ follows logically from the premises $(C \vee D), (C \vee D) \rightarrow \neg H, \neg H \rightarrow (A \wedge \neg B)$ and $(A \wedge \neg B) \rightarrow (R \vee S)$.	**[5M]**

UNIT-2

4	a)	Show that f(x, y) = x + y is primitive recursive.	**[5M]**
	b)	Let f(x)= x+2, g(x)=x-2 and h(x) = 3x for x ∈ R where R is set of real numbers.Find g ◦ f; f ◦ g ; f ◦f; g ◦ g; f ◦ h; h ◦ g; h ◦ f and f ◦ h ◦ g.	**[5M]**
		(OR)	
5	a)	Explain lattice and write its properties.	**[5M]**
	b)	Explain relation matrix and digraph with an example.	**[5M]**

UNIT-3

6	a)	Explain Groups, Subgroups and Normal subgroups.	**[5M]**
	b)	Let G1 and G2 be subgroups of a group G, show that $G1 \cap G2$ is also a subgroup of G and Is $G1 \cup G2$ is always a subgroup of G.	**[5M]**
		(OR)	
7	a)	Explain about homomorphism	**[5M]**
	b)	Write the Euclidian algorithm with an example.	**[5M]**

UNIT-4

8	a)	Suppose that 200 faculty members can speak French and 50 can speak Russian, while only 20 can speak both French and Russian. How many faculty members can speak either French or Russian.	**[5M]**
	b)	Explain the circular permutations. Give an example.	**[5M]**

		(OR)	
9	a)	Find out the coefficient of x9y3 in the expansion of (x+2y)12 using binomial theorem	**[5M]**
	b)	Explain the enumerating permutations with constrained repetitions.	**[5M]**
		UNIT-5	
10		Define K- regular graph. Give examples of 2- regular, 3- regular, 4- regular graphs.	**[10M]**
		(OR)	
11	a)	State and explain four color theorem with an example.	**[5M]**
	b)	Explain krushkal's algorithm with an example.	**[5M]**

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