

SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

(AUTONOMOUS)

II B. Tech II Sem – Semester End Examinations – Regular – Mar 2021

DISCRETE MATHEMATICS**[R204GA05401]**

(Common to CSE, CSD & CSM)

Time: 3 hours**Max. Marks: 70****PART-A**

(Compulsory Question)

1		Answer the following: (10 X 02 = 20 Marks)
	a)	Construct the truth table for $(P \wedge Q) \vee (Q \wedge R) \vee (P \wedge \neg R)$.
	b)	What is composition of function?
	c)	What is congruence relation. Give an example.
	d)	Suppose that Florida state university has a residence hall that has 5 single rooms, 5 double rooms, and 3 rooms for 3 students each. In how many ways can 24 students be assigned to the 13 rooms.
	e)	What do you mean by graph isomorphism, show it by example?

PART-B

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

UNIT-1

2	a)	Explain the well - formed formulas.	[5M]
	b)	Explain Disjunctive Normal Form.	[5M]
OR			
3	a)	Show that $S \vee R$ is tautologically implied by $(P \vee Q) \wedge (P \rightarrow R) \wedge (Q \rightarrow S)$.	[5M]
	b)	Demonstrate that R is a valid inference from the premises $P \rightarrow Q, Q \rightarrow R$ and P.	[5M]

UNIT-2

4	a)	Let $X = \{2, 3, 6, 12, 24, 36\}$ and the relation \leq be such that $x \leq y$ if x divides y. Draw the Hasse diagram of (X, \leq) .	[5M]
	b)	Let $X = \{1, 2, 3, 4, 5, 6, 7\}$ and $R = \{(x, y) \mid x - y \text{ is divisible by } 3\}$. Show that R is an equivalence relation. Draw the graph of R.	[5M]

OR

5	a)	Explain the recursive function. Give an example.	[5M]
	b)	Explain lattice and write its properties.	[5M]

UNIT-3

6	a)	Explain about homomorphism.	[5M]
	b)	Define a semigroup and monoid. Give an example of a monoid which is not a group. Justify the answer.	[5M]

OR

7		Explain the Fermat's theorem and Euler's theorem with an example.	[10M]
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UNIT-4			
8	a)	How many different outcomes are possible by tossing 10 similar coins?	[5M]
	b)	Find a generating function for a_r = the number of ways of distributing r similar balls into n numbered boxes where each box is nonempty.	[5M]
OR			
9		Explain pigeonhole principle and its applications.	[10M]
UNIT-5			
10		Define K- regular graph. Give examples of 2- regular, 3- regular, 4- regular graphs.	[10M]
OR			
11		Differentiate between Eulerian graph & Hamiltonian graph with example. And also give an example of a graph which Eulerian but not Hamiltonian.	[10M]
