

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)

1		Answer the following: (5 X 02 = 10 Marks)
	a)	Show that the formula $Q \vee (P \wedge \neg Q) \vee (\neg P \wedge Q)$ is a tautology.
	b)	Define the Power set. Give an example.
	c)	Define abelian group.
	d)	Find the GCD of 826, 1890.
	e)	Define spanning tree.

PART-B

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

UNIT-1

2	a)	Explain the well - formed formulas with an example.	[5M]
	b)	Show that $R \wedge (P \vee Q)$ is a valid conclusion from the premises $P \vee Q$, $Q \rightarrow R$, $P \rightarrow M$ and $\neg M$.	[5M]
(OR)			
3	a)	Construct the truth table for $(Q \wedge (P \rightarrow Q) \rightarrow P)$.	[5M]
	b)	Obtain the principal conjunctive normal form of the formula S given by $(\neg P \rightarrow R) \wedge (Q \leftrightarrow P)$.	[5M]

UNIT-2

4	a)	Explain the principle of inclusion and exclusion.	[5M]
	b)	Let $f(x) = x^2 - 3x + 2$, find $f(x^2)$, $f(y-x)$ and $f(x+3)$.	[5M]
(OR)			
5		What is relation? Explain the properties of binary relations with examples.	[10M]

UNIT-3

6	a)	Explain the testing for prime numbers with an example.	[5M]
	b)	Explain division theorem. Give an example.	[5M]
(OR)			
7	a)	Explain about homomorphism	[5M]
	b)	Write the Euclidian algorithm with an example.	[5M]

UNIT-4

8	a)	How many 5 digit numbers can be formed by 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. So that 2 is always there in the number?	[5M]
	b)	Explain the circular permutations. Give an example.	[5M]
(OR)			
9	a)	From a group of professors how many ways can a committee of 5 members be formed so that at least one of professor A and professor B will be included?	[5M]

	b)	In how many ways can a hand of 5 cards be selected from a deck of 52 cards?	[5M]
UNIT-5			
10		Write the algorithms for spanning trees with an example.	[10M]
(OR)			
11	a)	Prove that the complete graph of 5 vertices is non-planar.	[5M]
	b)	Explain the matrix representation of graphs with example.	[5M]
