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

SRIT R20

SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

(AUTONOMOUS)

II B. Tech II Sem – Continuous Internal Examinations I – Apr 2023 (AY: 2022-2023)

DISCRETE MATHEMATICS

[R204GA05401]

(Common to CSE, CSD & CSM)

Time: 2 hours **SET – 1** **Max. Marks: 30**

Answer the following questions

Q. No		Questions	Unit	Marks	CO	Cognitive Level
1	a)	Construct the truth table for (P∧Q) V (Q ∧R) V (P∧¬R).	I	2	CO1	Understand
	b)	Define inverse function.	II	2	CO1	Remember
	c)	Define Algebraic System.	III	2	CO1	Remember
UNIT-I						
2	a)	Explain the well - formed formulas with an example.		4	CO2	Understand
	b)	Illustrate Equivalence Formulas.		4	CO2	Understand
OR						
3	a)	Show that (R ∨S) follows logically from the premises (C∨D), (C ∨D) → ¬ H, ¬H →(A ∧ ¬ B) and (A∧¬ B) → (R∨S).		4	CO2	Apply
	b)	Show that S V R is tautologically implied by (P∨Q) ∧ (P →R) ∧ (Q →S).		4	CO2	Apply
UNIT-II						
4	a)	Find the transitive closure of the Relation which is represented by: $\begin{bmatrix} 1&1&0&0&0 \\ 1&1&0&0&0 \\ 0&0&1&1&0 \\ 0&0&1&1&1 \\ 0&0&0&1&1 \end{bmatrix}$		4	CO3	Apply
	b)	Demonstrate the relation a R b if a ≤ b in {1, 2, 3, 4} by using their matrix and Digraph.		4	CO3	Apply
OR						
5	a)	Explain the principle of inclusion and exclusion.		4	CO3	Understand
	b)	Explain the properties of binary relations with examples.		4	CO3	Understand
UNIT-III						
6		Let X = {a, b}and S denote the set of all mapping from X to X. Let us write S = {f_1, f_2, f_3, f_4 } where $f_1(a) = a$ $f_1(b) = b$ $f_2(a) = a$ $f_2(b) = a$ $f_3(a) = b$ $f_3(b) = b$ $f_4(a) = b$ $f_4(b) = a$ Construct Composition table for the Operation ∘		8	CO4	Apply
OR						

7	Illustrate algebraic system and its properties with suitable examples.	8	CO4	Apply

Prepared by

Name of the Faculty: Mr. M. Narasimhulu, Mr. G. Chinna Pullaih , Mr. P. Ram Bayapa Reddy,

Signature of the Faculty:

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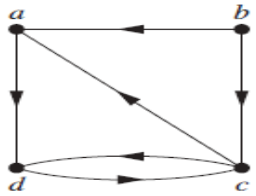
DISCRETE MATHEMATICS

[R204GA05401]

(Common to CSE, CSD & CSM)

Time: 2 hours **SET – 2** **Max. Marks: 30**

Answer the following questions

Q. No		Questions	Unit	Marks	CO	Cognitive Level
1	a)	Define tautology and contradiction.	I	2	CO1	Remember
	b)	Given A= { 2,5,6}, B={ 3,4,2}, C={ 1,3,4}, find A- B and B – A. Show that A – B ≠ B – A and A – C = A.	II	2	CO1	Understand
	c)	Classify the Properties of Integer for Addition.	III	2	CO1	Understand
UNIT-I						
2	a)	Show that (R ∨S) follows logically from the premises (C∨D), (C ∨D) → ¬ H, ¬H → (A ∧ ¬ B) and (A ∧¬ B) → (R∨S).		4	CO2	Apply
	b)	Illustrate theory of Inference for a statement Calculus.		4	CO2	Understand
OR						
3	a)	Compute the principal disjunctive normal form of (¬ P ∧Q) and (P ∧ Q) ∨ (¬ P ∧ R) ∨ (Q ∧ R).		4	CO2	Apply
	b)	Show that S ∨ R is tautologically implied by (P∨Q) ∧ (P →R) ∧ (Q →S).		4	CO2	Apply
UNIT-II						
4	a)	Let X = {2, 3, 6, 12, 24, 36} and the relation ≤ be such that x ≤ y if x divides y. Draw the Hasse diagram of (X, ≤).		4	CO3	Apply
	b)	Let X = {1, 2, 3, 4} and R = { (x, y) | x > y }. Draw the graph of R and give its matrix. Also, specify the type of relation.		4	CO3	Apply
OR						
5		Calculate Transitive Closure of the following digraph.  Specify the transitive closure in matrix, digraph and relation tabular form.		8	CO3	Apply
UNIT-III						
6	a)	Describe about Homomorphism, Semi Groups and Monoids with an example.		4	CO4	Understand
	b)	Explain Groups, Subgroups and Abelian Group		4	CO4	Understand
OR						
7	a)	Describe Isomorphism and epimorphism.		4	CO4	Understand

	b)	Describe endomorphism and automorphism.	4	CO4	Understand

Prepared by

Name of the Faculty: Mr. M. Narasimhulu, Mr. G. Chinna Pullaih, Mr. P. Ram Bayapa Reddy.

Signature of the Faculty: