SRM Institute of Science and Technology
College of Engineering and Technology
Department of Mathematics
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

Academic Year: 2023-2024(ODD)

Assignment - 1

Date: 03/08/2023

Course Code & Title: 18MAB302T-Discrete Mathematics for Engineer
Year & Sem: III/V

Note:

Answer All the Questions

S.No.	Course Outcome		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12
1	CO 1	Apply the concepts of set theory and its operations in data structures and mathematical modeling languages	3	3	-	-	-	-	-	-	-	-	-	-
2	CO 2	Solve problems using counting techniques and understanding the basics of number theory	3	3	-	-	-	-	-	-	-	-	-	-
3	CO 3	Comprehend and validate the logical arguments using concepts of inference theory	3	3	-	-	-	-	-	-	-	-	-	-
4	CO 4	Inculcate the curiosity for applying the concepts of algebraic structures to coding theory	3	3	-	-	-	-	-	-	-	-	-	-
5	CO 5	Apply graph theory techniques to solve wide variety of real world problems	3	3	-	-	-	-	-	-	-	-	-	-
6	CO 6	Acquire knowledge in mathematical reasoning, combinatorial analysis and discrete structures	3	3	-	-	-	-	-	-	-	-	-	-

Q. No	Part A	BL	CO	PO	PI
1	Prove analytically $A - (B \cap C) = (A - C) \cap (A - B)$ where A, B and C are sets.	2	1	2	2.1.3
2	If a binary relation is defined on a set of cardinality 'n', how many reflexive and symmetric relation is possible?	2	1	2	2.1.3
3	Let A = {1,2,3,4,5,6,7,8} be a set. Let R is a relation on the set A defined by aRb if and only if a divides b. Draw the diagraph representing by the relation R.	2	1	2	2.1.3
4	If $f(x) = x - 2$ and $g(x) = x + 2$ for $x \in R$, then prove that $f \circ g = g \circ f$.	2	1	2	2.1.3
5	If R is a relation on the set $A = \{3^n \mid n \in N\}$ defined by aRb if and only if $\frac{b}{a}$ is an integer. Show that R is partial ordering on A.	2	1	2	2.1.3
	Part B				

6	Show that $A \cap B = A \cap C$ need not always imply $B = C$. Also, show that $A \cup B = A \cup C$ and $A \cap B = A \cap C$ both imply $B = C$.	**3**	**1**	**2**	**2.1.3**
7	Let R= {(1,1),(1,2),(2,2),(3,3),(4,3),(4,4),(4,5),(5,5), (6,6)} be a relation on the set A = {1, 2, 3, 4, 5, 6}. Find the symmetric closure of R. Then find the transitive closure using Warshall's algorithm.	**3**	**1**	**2**	**2.2.3**
8	Draw the Hasse diagram for the "less than or equal to" relation on {0, 2, 5, 10, 11, 15} starting from the digraph.	**3**	**1**	**2**	**2.1.3**
9	If $f: Z \to N$ defined by $f(x) = \{-2x,\ x \leq 0\ 2x-1,\ x > 0$, prove that f is bijective.	**4**	**1**	**2**	**2.1.3**
10	Let $f:\ R \to R^+$ be a function defined by $f(x) = x^2$. Show that f is onto but not one-to-one.	**3**	**1**	**2**	**2.1.3**