SRM Institute of Science and Technology
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Department of Mathematics
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Academic Year: 2023-2024 (ODD)
Tutorial sheet - 1

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

Q. No	Questions	Answer Keys
1	Simplify the following using set theoretical laws: $$(A \cup B \cup C) \cap (A \cap B' \cap C')' \cap C'$$	B ∩ C′
2	Write the dual of $(A \cup \phi) \cup (\mathbb{U} \cap A') = \mathbb{U}$	
3	Let A = {1, 2, 3} and B = {a, b} then prove that $A \times B \neq B \times A$.	
4.	Let A, B, C are sets and U is the universal set then prove that $A - B = \emptyset$ if and only if $A \subseteq B$	
5.	Use the set builder notation to establish the identities $$(A - C) \cap (C - B) = \emptyset$$	
6.	Let A, B, C are sets and U is the universal set then prove that $A - B = A$ if and only if $A \cap B = \emptyset$	
7.	Simplify the following sets using set identities i. $\bar{A} \cup \bar{B} \cup (A \cap B \cap \bar{C})$ ii. $(A \cap B) \cup [B \cap [(C \cap D) \cup (C \cap \bar{D})]]$	
8.	If A and B are any two sets, prove analytically or using set identities, $A \cap (B - C) = (A \cap B) - (A \cap C)$. Also show that $A \cup (B - C) \neq (A \cup B) - (A \cup C)$. Is the principle of duality failed here? Explain.	
9.	Find the Dual of the following i. $A \cup A' = U$ ii. $(A \cup B)' = A' \cap B'$ iii. $(A \cap B')' \cup B = A' \cup B$	**i.** $A \cap A' = \emptyset$ **ii.** $(A \cap B)' = A' \cup B'$ **iii.** $(A \cup B')' \cap B = A' \cap B$
10.	If A and B are sets prove that $A \subseteq B$ if and only if $B' \subseteq A'$.	