M.M. ENGINEERING COLLEGE, MULLANA (AMBALA)

DEPARTMENT OF CSE

Tutorial / Assignment Sheet No. : 1.1

Branch / Semester: CSE / 4th **Course Name:** Discrete Mathematics **Course Code:** BCSE-508

Topics covered: Operations of sets, Axioms, Power set, Subset, and Cardinality of sets (Unit-1)

Date of Release: 25.01.2021 **Last date of submission:** 29.01.2021 **Total Marks:** 30

Assignment Outcomes:

i) **Able to perform various operations on sets.**

ii) **Able to find out cardinality of set.**

Q. No.	"All Questions are compulsory"	Marks
	Section-A (Each question of 1 mark)	
1.	Define the following sets: i) $\emptyset \cup \{\emptyset\}$ ii) $\emptyset \cap \{\emptyset\}$ iii) $\{\emptyset\} \cup \{a, \emptyset, \{\emptyset\}\}$ iv) $\{\emptyset\} \cap \{a, \emptyset, \{\emptyset\}\}$ v) $\emptyset \oplus \{a, \emptyset, \{\emptyset\}\}$ vi) $\{\emptyset\} \oplus \{a, \emptyset, \{\emptyset\}\}$	06
	Section-B (Each question of 2 mark)	10
2.	Let A, B, C be subsets of U. Given that: $A \cap B = A \cap C$ & $A^c \cap B = A^c \cap C$. Show that whether it is necessary that B = C? Justify your answer.	
3.	Let A and B be two arbitrary sets. Show that Powerset (A ∩ B) = Powerset (A) ∩ Powerset (B) or give a counter example.	
4.	Let A and B be two arbitrary sets. Show that Powerset (A U B) = Powerset (A) ∩ Powerset (B) or give counter example.	
5.	Show that set of real numbers between 0 & 1 is not a countably infinite set.	
6.	Differentiate between Belongs to and Subset operation with example.	
	Section-C (Each question of 4 mark)	08
7.	Write down the Type, Symbol used, Input value, Output value, Purpose and example corresponding to following Set operations: i) Complement ii) Symmetric Difference	
8.	Determine the cardinalities of the sets. i) $A = \{n^{10}/n$ is positive even integers $\}$ ii) $B = \{n^{201}/$ n is positive prime integer $\}$ iii) A U B iv) A ∩ B	
	Section-D (6 mark question)	06
9.	Let A, B, C be arbitrary sets: i) Show that (A - B) - C = A - (B U C) ii) Show that (A - B) - C = (A - C) - B iii) Show that (A - B) - C = (A - C) - (B - C)	

Note for students: Students are required to submit handwritten solutions of given assignment / tutorial sheet on or before Last date of submission otherwise penalty in terms of deduction in marks will be made as per following rule:

If submitted on or before last date then Deduction of marks = 0

If submission delayed by (1-7) days then Deduction of marks = 5

If submission delayed by (8-14) days then Deduction of marks = 10

If submission delayed by more than 15 days then Deduction of marks = 12.5