

## \* Reflective Journal \*

### \* MODULE - I \*

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(B)

#### \* Journal Entry Topic:

sets and binary operations.

#### \* Experience: (class content):

- This is our first week reflective Journal of term-I, module - I.
  - In this whole week we have studied about sets and binary operations.
- In set theory and Binary operation
- we have learned about  $\emptyset$ ,  $A \cup B$ ,  $A \cap B$ ,  $\bar{A}$ ,  $\bar{B}$ ,  $A \cup B \neq \emptyset \Leftrightarrow A \cap B \neq \emptyset$ .
  - Venn diagrams and binary sets.
  - Cardinality is no. of elements in a set.
  - natural no's always contains zero.

For Example: In a class of 50 students 28 play cricket, 30 play football, 18 play both. Find the number of students who play a) only cricket b) only football c) neither game.

Given total = 50

$$C = 28, F = 30, b = 18$$

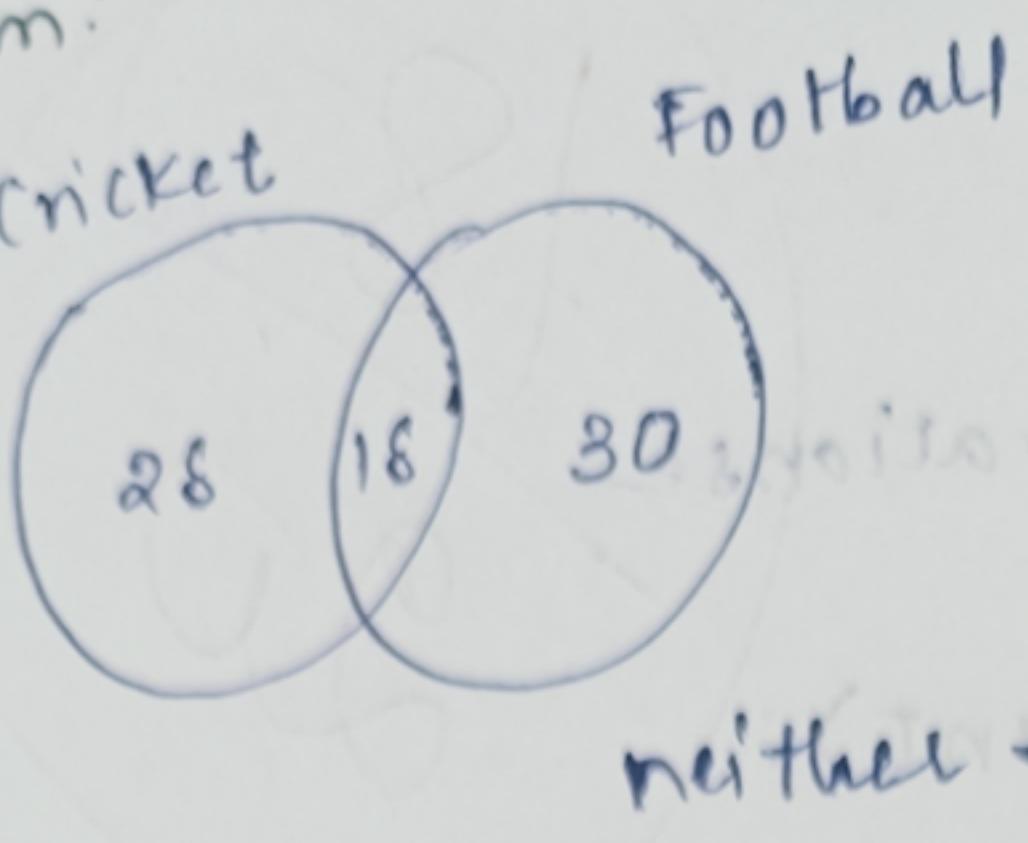
a) Only Cricket =  $28 - 18 = 10$

b) Only football =  $30 - 18 = 12$

At least one =  $28 + 30 - 18 = 40$

c) Neither =  $50 - 40 = 10$

Venn diagram:



$$* |A \cup B| = |A| + |B| - |A \cap B|$$

\* cartesian product

$$A \times B = \{(x, y) \mid x \in A, y \in B\}$$

$$|A \times B| = |A| \times |B|$$

\* Notations for empty set and single set

$$\emptyset = \{\}$$

$$\{ \emptyset \} = \{\{\}\}$$

$$\{ \emptyset, \{ \emptyset \} \} = \{\emptyset, \{\emptyset\}\}$$

$$n = \{\emptyset, 1, 2, \dots, n-1\}$$

\* Feelings:

- In the beginning I felt nervous because I some what couldnt able to solve problems and understand them.
- But discussing with friends and solving problems together made easier for me.
- I felt happy when we got the chance to discuss with friends and it is very helpful to each other.

- Now I am a little less nervous because its been 1 week and made friends and the madam is very supportive and friendly.

#### \* Learning:

- In this I have learnt how to solve the problem by using set operations and how to represent them in Venn diagrams.
- $\{0\}$  = singleton set
- $A \cup B \rightarrow$  this is a union set  $\{A \cup B\}$
- $A \cap B \rightarrow$  this is a intersection set
- Cardinality  $\rightarrow$  cardinality means the no. of elements present in a set  $A \cap B = 3$
- $A - B = \{x | x \in A \text{ and } x \notin B\}$
- $B - A = \{x | x \in B \text{ and } x \notin A\}$
- $A = \{1, 2, 3, 4, 5, 6\}$
- $B = \{2, 3, 1, 6, 8\}$
- $A \cap B = \{2, 4, 6, 8\}$ .

#### \* Applications:

- Data is organised in table as sets
- Operations like union, intersection and difference are used in SQL queries
- Ex: finding students enrolled in dance club or Music club (union)
- logic gates perform AND, OR, XOR operations directly on signals.

- Venn diagrams are also used in research and comparisons.

#### \* Conclusion:

- I have concluded that set theory is useful to classify and analyze data using concepts such as union, intersection in set theory.
- This set theory not only useful for Mathematics, it is also useful for programming languages like python, Java etc..
- Set theory does not only strengthens logical thinking but also simplifies the problem solving.
- $|A \cup B| = |A| + |B| - |A \cap B|$  is useful to solve a lot of problems
- Venn diagrams are also useful to solve problems.

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