



Question

Paper: +1 (Maths)

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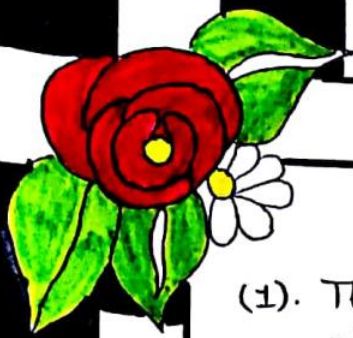
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(Part-A)

(1). The set of numbers which are the multiples of 5 is:

- (A) a finite set (B) an infinite set (C) a singleton set (D) None of these.

Sol. $\Rightarrow$ (B) An infinite Set

(2) Range of data: 20, 40, 30, 60, 80, 100, 10, 70 is:

- (A) 10 (B) 100 (C) 90 (D) None of these.

Sol. $\Rightarrow$ we know that,
Range = $100 - 10 = 90$

$\therefore$ (C) 90

(3) The n th term of an A.P is given by $a_n = 3 + 4n$.
The Common difference is:

- (A) 4 (B) 7 (C) 3 (D) 1

Sol. $\Rightarrow$ Here, $a_n = 3 + 4n$

$$\therefore a_1 = 3 + 4 = 7$$

$$a_2 = 3 + 8 = 11$$

$$a_3 = 3 + 12 = 15$$

$$\therefore \text{Common Difference} = a_2 - a_1 \\ = 11 - 7 = 4$$

$\therefore$ (A) 4.

(4) A Set has 4 Elements, then total no. of subset is:

- (A) 4 (B) 14 (C) 16 (D) None of these

Sol. $\Rightarrow$ Here, $O(A) = 4$

As, we know that

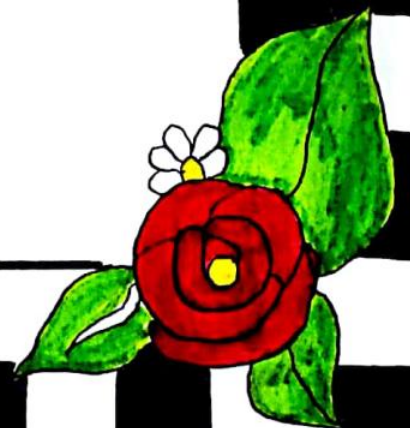
$$\text{if } O(A) = n$$

$$\text{then, no. of Subset of } A = 2^n$$

$$\therefore \text{Here, } n = 4$$

$$\therefore \text{total no. of Subset} = 2^4 = 16$$

$\therefore$ (C) 16



(5) Sum of Series: $1+2+3+\dots+n$ is:

- (A) $\frac{n(n+1)}{2}$ (B) $n(n+1)$ (C) $\frac{(n+1)(n+2)}{2}$ (D) None of these

Sol. $\Rightarrow$ we are given,
 $1+2+3+\dots+n$

As, we know that,

$$S_n = \frac{n}{2} \{a+l\}$$

$$\therefore 1+2+3+\dots+n = \frac{n}{2} \{1+n\}$$
$$= \frac{n(n+1)}{2}$$

$\therefore$ (A) $\frac{n(n+1)}{2}$

(6) Coefficient of Variation is

Sol. $\Rightarrow$ Coefficient of Variation is $\frac{S.D}{Mean} \times 100$.

(7) Roster form of the set $\{x: x \text{ is an integer and } -3 < x < 7\}$ is

Sol. $\Rightarrow$ The Roster form of the set is
 $\{-2, -1, 0, 1, 2, 3, 4, 5, 6\}$

(8) Geometric Mean between two positive real numbers a and b is

Sol. $\Rightarrow$ Geometric Mean between a and $b = \sqrt{ab}$, $a, b > 0$

(Part-B)

(a) If $A = \{1, 2, 3, 4\}$ and $B = \{3, 4, 5, 6, 7\}$. find

- (i) $A \cup B$ (ii) $A \cap B$ (iii) $A - B$ (iv) $B - A$

Sol. $\Rightarrow$ we are given

$$A = \{1, 2, 3, 4\}, B = \{3, 4, 5, 6, 7\}$$

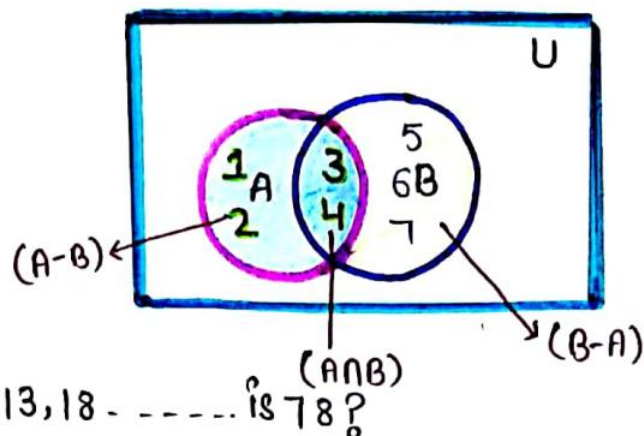
$$(i) A \cup B = \{1, 2, 3, 4\} \cup \{3, 4, 5, 6, 7\}$$

$$\therefore A \cup B = \{1, 2, 3, 4, 5, 6, 7\}$$

$$(ii) A \cap B = \{3, 4\}$$

$$(iii) A - B = \{1, 2\}$$

$$(iv) B - A = \{5, 6, 7\}$$



(10) Which term of the A.P: 3, 8, 13, 18, ... is 78?

Sol. ⇒ The given A.P is

3, 8, 13, 18, ... 78

$$\therefore a = 3, \quad d = 8 - 3 = 5$$

$$\text{Let } T_n = 78$$

$$\therefore a + (n-1)d = 78$$

$$\therefore 3 + (n-1)(5) = 78$$

$$\therefore (n-1)(5) = 75$$

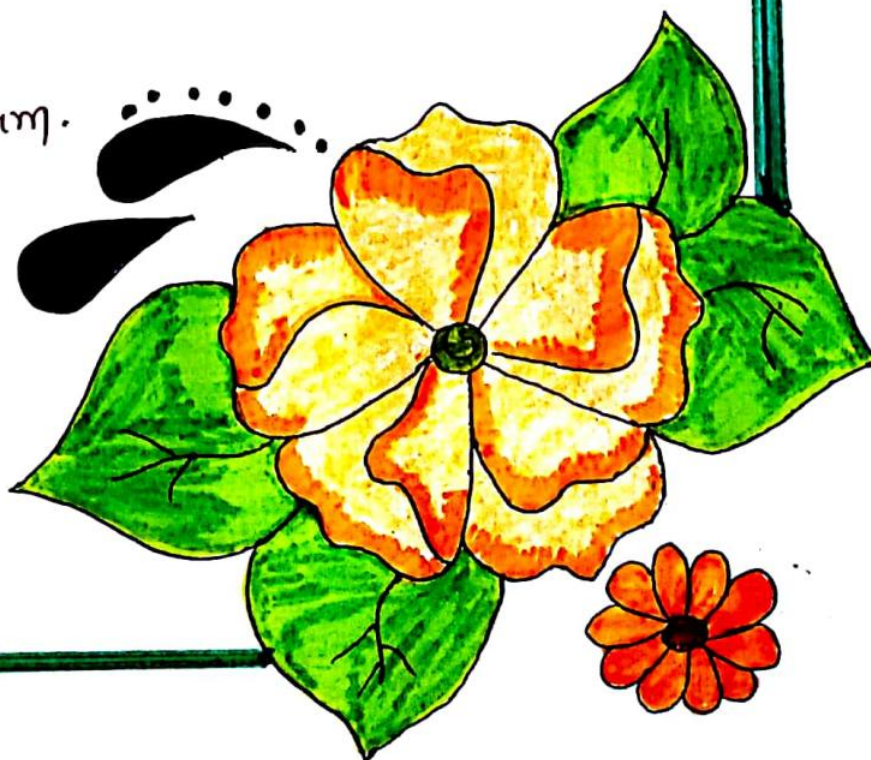
$$\therefore (n-1) = \frac{75}{5} = 15$$

$$\therefore (n-1) = 15$$

$$\therefore n = 15 + 1$$

$$\boxed{n = 16}$$

$\therefore 78$ is the 16th term.



11) In a Survey of 400 Students in a school 100 were listed as taking apple juice, 150 as taking orange juice and 75 were listed as taking both apple as well as orange juice. find how many students were taking neither apple juice nor orange juice.

Sol.

Let A be the set of students taking apple juice and B be the set of students taking orange juice.

$$\therefore n(U) = 400, n(A) = 100, n(B) = 150$$

$$n(A \cap B) = 75$$

$$\therefore n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

$$\therefore n(A \cup B) = 100 + 150 - 75$$

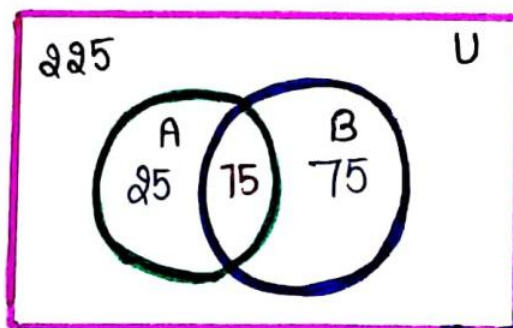
$$\therefore n(A \cup B) = 250 - 75 = 175$$

$$\therefore n(A^c \cap B^c) = n((A \cup B)^c) = n(U) - n(A \cup B)$$

$$\therefore n(A^c \cap B^c) = n(U) - n(A \cup B)$$

$$\therefore n(A^c \cap B^c) = 400 - 175 = 225$$

$\therefore$ no. of students neither taking apple juice nor taking orange juice = **225**



OR



Ques) find the Sum of Series: $7+77+777+\dots$ To n terms.

Sol.

$\Rightarrow$ Let $S_n = 7+77+777+\dots$ To n terms

$$\therefore S_n = 7 \cdot \{1+11+111+\dots \text{to } n \text{ terms}\}$$

$$\therefore S_n = \frac{7}{9} \{9+99+999+\dots \text{to } n \text{ terms}\}$$

$$\therefore S_n = \frac{7}{9} \{(10-1)+(100-1)+(1000-1)+\dots \text{to } n \text{ terms}\}$$

$$\therefore S_n = \frac{7}{9} \{(10+100+1000+\dots \text{to } n \text{ terms}) - (1+1+1+\dots \text{to } n \text{ terms})\}$$

$$\therefore S_n = \frac{7}{9} \left\{ \frac{10(10^n-1)}{10-1} - n \right\} \quad \left\{ \because S_n = \frac{a(r^n-1)}{r-1}, r \neq 1 \right\}$$

$$\therefore S_n = \frac{7}{9} \left\{ \frac{10(10^n-1)}{9} - n \right\}$$

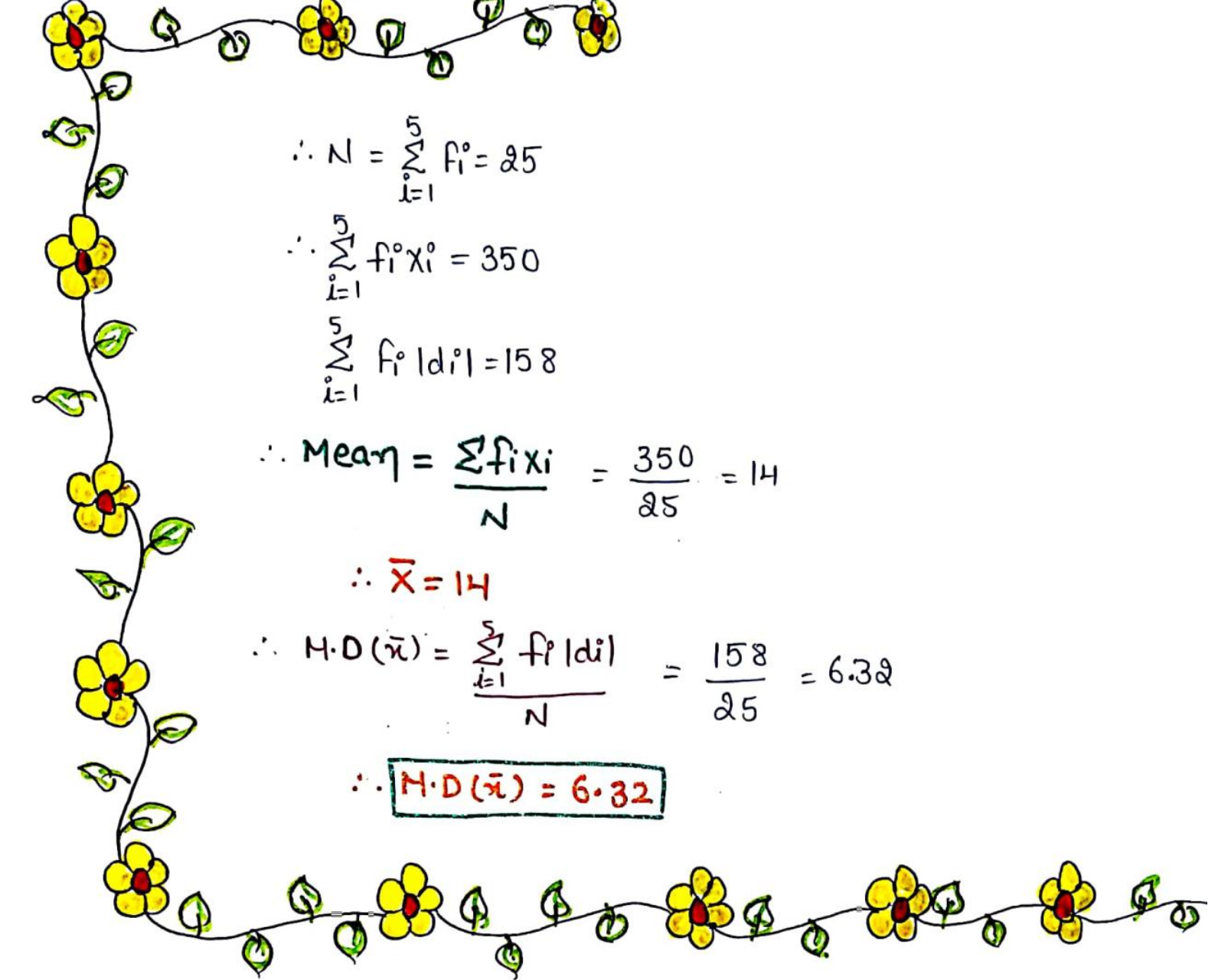
$$\therefore S_n = \frac{7}{81} \{10^{n+1} - 9n - 10\}$$

(12) find Mean deviation about mean for the following data:

X_i	5	10	15	20	25
F_i	7	4	6	3	5

Sol.

X_i	F_i	$X_i F_i$	$ d_i = x_i - \bar{x} $	$F_i d_i $
5	7	35	9	63
10	4	40	4	16
15	6	90	1	6
20	3	60	6	18
25	5	125	11	55
	$N=25$	350		158


$$\therefore N = \sum_{i=1}^5 f_i = 25$$

$$\therefore \sum_{i=1}^5 f_i x_i = 350$$

$$\sum_{i=1}^5 f_i |d_i| = 158$$

$$\therefore \text{Mean} = \frac{\sum f_i x_i}{N} = \frac{350}{25} = 14$$

$$\therefore \bar{X} = 14$$

$$\therefore \text{M.D}(\bar{x}) = \frac{\sum f_i |d_i|}{N} = \frac{158}{25} = 6.32$$

$$\therefore \boxed{\text{M.D}(\bar{x}) = 6.32}$$