

DPP

DAILY PRACTICE PROBLEMS

Class : XIth
Date :

Solutio

Subject : MATHS
DPP No. :1

Topic :-SETS

1 (b)

For any $a \in R$, we have $a \geq a$

Therefore, the relation R is reflexive.

R is not symmetric as $(2,1) \in R$ but $(1,2) \notin R$. The relation R is transitive also, because $(a,b) \in R, (b,c) \in R$ imply that $a \geq b$ and $b \geq c$ which in turn imply that $a \geq c$

2 (d)

Clearly, R is an equivalence relation

3 (c)

Let M and E denote the sets of students who have taken Mathematics and Economics respectively. Then, we have

$$n(M \cup E) = 35, n(M) = 17 \text{ and } n(M \cap E') = 10$$

Now,

$$n(M \cap E') = n(M) - n(M \cap E)$$

$$\Rightarrow 10 = 17 - n(M \cap E) \Rightarrow n(M \cap E) = 7$$

Now,

$$n(M \cup E) = n(M) + n(E) - n(M \cap E)$$

$$\Rightarrow 35 = 17 + n(E) - 7 \Rightarrow n(E) = 25$$

$$\therefore n(E \cap M') = n(E) - n(E \cap M) = 25 - 7 = 18$$

4 (a)

$$\text{Let } A = \{n(n+1)(2n+1) : n \in \mathbb{Z}\}$$

$$\text{Putting } n = \pm 1, \pm 2, \dots, \text{ we get } A = \{\dots - 30, -6, 0, 6, 30, \dots\}$$

$$\Rightarrow \{n(n+1)(2n+1) : n \in \mathbb{Z}\} \subset \{6k : k \in \mathbb{Z}\}$$

5 (a)

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

$$\therefore (A \cup B) \cap C = \{1, 2, 3, 4, 5, 6\} \cap \{3, 4, 6\}$$

$$= \{3, 4, 6\}$$

6 (d)

We have,

$$n(A \cap \bar{B}) = 9, n(\bar{A} \cap B) = 10 \text{ and } n(A \cup B) = 24$$

$$\Rightarrow n(A) - n(A \cap B) = 9, n(B) - n(A \cap B) = 10 \text{ and } n(A) + n(B) - n(A \cap B) = 24$$

$$\Rightarrow n(A) + n(B) - 2n(A \cap B) = 19 \text{ and } n(A) + n(B) - n(A \cap B) = 24$$

$$\Rightarrow n(A \cap B) = 5$$

$$\therefore n(A) = 14 \text{ and } n(B) = 15$$

$$\text{Hence, } n(A \times B) = 14 \times 15 = 210$$

7 (a)

Clearly, $P \subset T$

$$\therefore P \cap T = P$$

8 (a)

It is given that A is a proper subset of B

$$\therefore A - B = \phi \Rightarrow n(A - B) = 0$$

We have, $n(A) = 5$. So, minimum number of elements in B is 6

$$\text{Hence, the minimum possible value of } n(A \Delta B) \text{ is } n(B) - n(A) = 6 - 5 = 1$$



9 (d)

$$\therefore n(A \times B \times C) = n(A) \times n(B) \times n(C)$$

$$\therefore n(C) = \frac{24}{4 \times 3} = 2$$

10 (b)

$$\text{Use } n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

11 (d)

$$\therefore A = \{(a, b) : a^2 + 3b^2 = 28, a, b \in \mathbb{Z}\}$$

$$= \{(5, 1), (-5, -1), (5, -1), (-5, 1), (1, 3), (-1, -3), (-1, 3),$$

$$(1, -3), (4, 2), (-4, -2), (4, -2), (-4, 2)\}$$

$$\text{And } B = \{(a, b) : a > b, a, b \in \mathbb{Z}\}$$

$$\therefore A \cap B = \{(-1, -5), (1, -5), (-1, -3), (1, -3), (4, 2), (4, -2)\}$$

\therefore Number of elements in $A \cap B$ is 6.

13 (d)

We have

$$R = \{(1,39), (2,37), (3,35), (4,33), (5,31), (6,29),$$

$$(7,27), (8,25), (9,23), (10,21), (11,19), (12,17),$$

$$(13,15), (14,13), (15,11), (16,9), (17,7), (18,5),$$

$$(19,3), (20,1)\}$$

Since $(1,39) \in R$, but $(39,1) \notin R$

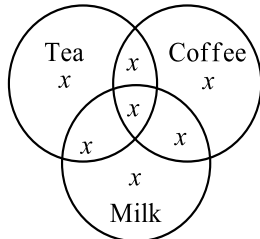
Therefore, R is not symmetric

Clearly, R is not reflexive. Now, $(15,11) \in R$ and $(11,19) \in R$ but $(15,19) \notin R$

So, R is not transitive

14 (c)

Total number of employees = $7x$ i.e. a multiple of 7. Hence, option (c) is correct



15 (a)

The power set of a set containing n elements has 2^n elements.

Clearly, 2^n cannot be equal to 26

16 (b)

The relation is not symmetric, because $A \subset B$ does not imply that $B \subset A$. But, it is anti-symmetric because

$$A \subset B \text{ and } B \subset A \Rightarrow A = B$$

18 (c)

We have, $A \supset B \supset C$

$$\therefore A \cup B \cup C = A \text{ and } A \cap B \cap C = C$$

$$\Rightarrow (A \cup B \cup C) - (A \cap B \cap C) = A - C$$

19 (c)

$$\text{Given, } n(C) = 63, n(A) = 76 \text{ and } n(C \cap A) = x$$

We know that,

$$n(C \cup A) = n(C) + n(A) - n(C \cap A)$$

$$\Rightarrow 100 = 63 + 76 - x \Rightarrow x = 139 - 100 = 39$$

And $n(C \cap A) \leq n(C)$

$$\Rightarrow x \leq 63 \quad \therefore 39 \leq x \leq 63$$

20 (b)

We have,

$X =$ Set of some multiple of 9



and, $Y =$ Set of all multiple of 9

$\therefore X \subset Y \Rightarrow X \cup Y = Y$

ANSWER-KEY

Q.	1	2	3	4	5	6	7	8	9	10
A.	B	D	C	A	A	D	A	A	D	B
Q.	11	12	13	14	15	16	17	18	19	20
A.	D	D	D	C	A	B	D	C	C	B



SMARTLEARN
COACHING