DPP
DAILY PRACTICE PROBLEMS

Class : XIth | **Solutions** | **Subject : MATHS**
Date : | | **DPP No. :2**

Topic :-SETS

21 **(c)**

$A \cap B = \{x{:}x$ a multiple of $3\}$and $\{x{:}x$ is a multiple of $5\}$

$= \{x{:}x$ is a multiple of $15\}$

$= \{15, 30, 45, \ldots\ldots\ldots\}$

22 **(b)**

We have,

$n(A \times B) = 45$

$\Rightarrow n(A) \times n(B) = 45$

$\Rightarrow n(A)$ and $n(B)$ are factors of 45 such that their product is 45

Hence, $n(A)$ cannot be 17

24 **(a)**

For any $x \in R$, we have

$x - x + \sqrt{2} = \sqrt{2}$ an irrational number

$\Rightarrow x \, R \, x$ for all x

So, R is reflexive

R is not symmetric, because $\sqrt{2} \, R \, 1$ but $1 \not{R} \sqrt{2}$

R is not transitive also because $\sqrt{2} \, R \, 1$ and $1 \, R \, 2\sqrt{2}$ but $\sqrt{2} \not{R} 2\sqrt{2}$

25 **(b)**

We have,

$n(H) - n(H \cap E) = 22, n(E) - n(H \cap E) = 12, n(H \cup E) = 45$

$\therefore n(H \cup E) = n(H) + n(E) - n(H \cap E)$

$\Rightarrow 45 = 22 + 12 + n(H \cup E)$

$\Rightarrow n(H \cap E) = 11$

26 **(c)**

We have, $A \subset B$ and $B \subset C$

$\therefore A \cup B = B$ and $B \cap C = B$

$\Rightarrow A \cup B = B \cap C$

27 **(c)**

Let $A = \left\{x \in R{:} \frac{2x-1}{x^3+4x^2+3x}\right\}$

Now, $x^3 + 4x^2 + 3x = x(x^2 + 4x + 3)$

$= x(x+3)(x+1)$

$\therefore \qquad A = R - \{0, -1, -3\}$

29 **(d)**

Clearly, $y^2 = x$ and $y = |x|$ intersect at (0,0),(1,1) and $(-1, -1)$. Hence, option (d) is correct

31 **(d)**

Let M,P and C be the sets of students taking examinations in Mathematics, Physics and Chemistry respectively.

We have,

$n(M \cup P \cup C) = 50, n(M) = 37, n(P) = 24, n(C) = 43$

$n(M \cap P) < 19, n(M \cap C) \leq 29, n(P \cap C) \leq 20$

Now,

$n(M \cup P \cup C) = n(M) + n(P) + n(C) - n(M \cap P)$

$-n(M \cap C) - n(P \cap C) + n(M \cap P \cap C)$

$\Rightarrow 50 = 37 + 24 + 43 - \{n(M \cap P) + n(M \cap C) + n(P \cap C)\}$

$+n(M \cap P \cap C)$

$\Rightarrow n(M \cap P \cap C) = n(M \cap P) + n(M \cap C) + n(P \cap C) - 54$

$\Rightarrow n(M \cap P) + n(M \cap C) + n(P \cap C)$

$= n(M \cap P \cap C) + 54 \qquad$ ...(i)

Now,

$n(M \cap P) \leq 19, n(M \cap C) \leq 29, n(P \cap C) \leq 20$

$\Rightarrow n(M \cap P) + n(M \cap C) + n(P \cap C) \leq 19 + 29 + 20 \quad$ [Using (i)]

$\Rightarrow n(M \cap P \cap C) + 54 \leq 68$

$\Rightarrow n(M \cap P \cap C) \leq 14$

33 **(a)**

Given, $n(N) = 12, n(P) = 16, n(H) = 18,$

$n(N \cup P \cup H) = 30$

And $\quad n(N \cap P \cap H) = 0$

Now, $n(N \cup P \cup H) = n(N) + n(P) + n(H)$

$-n(N \cap P) - n(P \cap H) - n(H \cap N)$

$+n(N \cap P \cap H)$

$\Rightarrow n(N \cap P) + n(P \cap H) + n(H \cap N) = (12 + 16 + 18) - 30$

$= 46 - 30 = 16$

35 **(b)**

The void relation R on A is not reflexive as $(a,a) \notin R$ for any $a \in A$. The void relation is symmetric and transitive

36 **(c)**

Given, A's are 30 sets with five elements each, so

$\sum_{i=1}^{30} n(A_i) = 5 \times 30 = 150 \qquad$ ...(i)

If the m distinct elements in S and each elements of S belongs to exactly 10 of the A_i's, then

$\sum_{i=1}^{30} n(A_i) = 10m \qquad$ ...(ii)

From Eqs. (i) and (ii), $m = 15$

Similarly, $\sum_{j=1}^{n} n(B_j) = 3n$ and $\sum_{j=1}^{n} n(B_j) = 9m$

$\therefore \qquad 3n = 9m$

$\Rightarrow \quad n = \frac{9m}{3} = 3 \times 15 = 45$

38 **(b)**

$A \cup B$ will contain minimum number of elements if $A \subset B$ and in that case, we have

$n(A \cup B) = n(B) = 6$

40 **(c)**

It is given that $A_1 \subset A_2 \subset A_3 \subset \ldots \subset A_{100}$

$$\therefore \bigcup_{i=3}^{100} A_i = A \Rightarrow A_3 = A \Rightarrow n(A) = n(A_3) = 3 + 2 = 5$$

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