DPP
DAILY PRACTICE PROBLEMS

Class : XIth
Date :

Solutions

Subject : MATHS
DPP No. :4

Topic :-SETS

61 **(c)**
It is given that
$A_1 \subset A_2 \subset A_3 \ldots \subset A_{99}$
$$\bigcup_{i=1}^{999} A_i = A_{99}$$
$$\Rightarrow n\left(\bigcup_{i=1}^{99} A_i\right) = n(A_{99}) = 99 + 1 = 100$$
62 **(b)**
It is given that $2^m - 2^n = 56$
Obviously, $m = 6, n = 3$ satisfy the equation
63 **(b)**
Clearly, $(a,a) \in R$ for any $a \in A$
Also,
$(a,b) \in R$
$\Rightarrow a$ and b are in different zoological parks
$\Rightarrow b$ and a are in different zoological parks
$\Rightarrow (b,a) \in R$
Now, $(a,b) \in R$ and $(b,a) \in R$ but $(a,a) \notin R$
So, R is not transitive
64 **(d)**
$X \cap Y = \{1, 2, 4, 5, 8, 10, 20, 25, 40, 50, 100, 200\}$
$\therefore \quad n(X \cap Y) = 12$
66 **(c)**
We have,
$X \cap (Y \cup X)' = X \cap (Y' \cap X') = (X \cap X') \cap Y' = \phi \cap Y' = \phi$
67 **(b)**
The number of subsets of A containing 2, 3 and 5 is same as the number of subsets of set {1, 4, 6} which is equal to $2^3 = 8$
68 **(a)**
We have,

$B_1 = A_1 \Rightarrow B_1 \subset A_1$
$B_2 = A_2 - A_1 \Rightarrow B_2 \subset A_2$
$B_3 = A_3 - (A_1 \cup A_2) \Rightarrow B_3 \subset A_3$
$\therefore B_1 \cup B_2 \cup B_3 \subset A_1 \cup A_2 \cup A_3$

69 **(d)**

The identity relation on a set A is reflexive and symmetric both. So, there is always a reflexive and symmetric relation on a set

70 **(a)**

Let the total number of voters be n. Then,

Number of voters voted for $A = \frac{nx}{100}$

Number of voters voted for $B = \frac{n(x+20)}{100}$

$\therefore$ Number of voters who voted for both

$$= \frac{nx}{100} + \frac{n(x+20)}{100}$$
$$= \frac{n(2x+20)}{100}$$

Hence, $n - \frac{n(2x+20)}{100} = \frac{20n}{100} \Rightarrow x = 30$

71 **(c)**

Since $(1,1) \notin R$. So, R is not reflexive

Now, $(1,2) \in R$ but, $(2,1) \notin R$. Therefore, R is not symmetric.

Clearly, R is transitive

72 **(b)**

Let A and B denote respectively the sets of families who got new houses and compensation

It is given that

$n(A \cap B) = n(\overline{A \cup B})$
$\Rightarrow n(A \cap B) = 50 - n(A \cup B)$
$\Rightarrow n(A) + n(B) = 50$
$\Rightarrow n(B) + 6 + n(B) = 50 \quad [\because n(A) = n(B) + 6 \text{ (given)}]$
$\Rightarrow n(B) = 22 \Rightarrow n(A) = 28$

73 **(b)**

We have,

$n(A' \cap B') = n((A \cup B)')$
$\Rightarrow n(A' \cap B') = n(\mathcal{U}) - n(A \cup B)$
$\Rightarrow n(A' \cap B') = n(\mathcal{U}) - \{n(A) + n(B) - n(A \cap B)\}$
$\Rightarrow 300 = n(\mathcal{U}) - \{200 + 300 - 100\}$
$\Rightarrow n(\mathcal{U}) = 700$

74 **(b)**

For any integer n, we have

$n|n \Rightarrow n\,R\,n$

So, $n\,R\,n$ for all $n \in Z$

$\Rightarrow R$ is reflexive

Now, $2|6$ but 6 does not divide 2

$\Rightarrow(2,\ 6) \in R$ but $(6,2) \notin R$
So, R is not symmetric
Let $(m,n) \in R$ and $(n,p) \in R$. Then,
$$\left.\begin{array}{r}(m,n) \in R \Rightarrow m|n \\ (n,p) \in R \Rightarrow n|p\end{array}\right\} \Rightarrow m|p \Rightarrow (m,p) \in R$$
So, R is transitive
Hence, R is reflexive and transitive but it is not symmetric
75 **(c)**
Since, $A = B \cap C$ and $B = C \cap A$,
Then $A \equiv B$
76 **(d)**
Since $n|n$ for all $n \in N$. Therefore, R is reflexive. Since $2|6$ but $6\nmid 2$, therefore R is not symmetric
Let $n\ R\ m$ and $m\ R\ p$
$\Rightarrow n\ R\ m$ and $m\ R\ p$
$\Rightarrow n|m$ and $m|p \Rightarrow n|p \Rightarrow n\ R\ p$
So, R is transitive
77 **(a)**
We have,
$b\ N = \{b\ x \mid x \in \mathrm{N}\} =$ Set of positive integral multiples of b
$c\ N = \{c\ x \mid x \in N\} =$ Set positive integral multiples of c
$\therefore bN \cap cN =$ Set of positive integral multiples of bc
$\Rightarrow bN \cap cN = bc\ N$ [$\because b$ and c are prime]
Hence, $d = bc$
79 **(b)**
Let $x,y \in A$. Then,
$x = m^2, y = n^2$ for some $m,n \in N$
$\Rightarrow xy = (mn)^2 \in A$
80 **(c)**
We have,
$A_1 \subset A_2 \subset A_3 \subset \ldots \subset A_{100}$
$$\therefore \bigcup_{i=1}^{100} A_i = A_{100} \Rightarrow n\left(\bigcup_{i=1}^{100} A_i\right) = n(A_{100}) = 101$$

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