DPP
DAILY PRACTICE PROBLEMS

Class : XIth
Date :

Solutions

Subject : MATHS
DPP No. :8

Topic :-SETS

142 **(d)**

Clearly, R is neither reflexive, nor symmetric and not transitive

143 **(d)**

Clearly, given relation is an equivalence relation

145 **(c)**

Each subset will contain 3 and any number of elements from the remaining 3 elements 1, 2 and 4

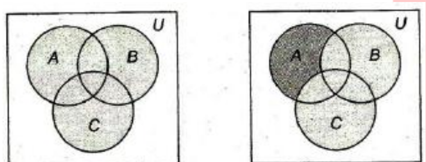
So, required number of elements $= 2^2 = 8$

146 **(a)**

Since $(1,1),(2,2),(3,3) \in R$. Therefore, R is reflexive. We observe that $(1,2) \in R$ but $(2,1) \notin R$, therefore R is not symmetric.

It can be easily seen that R is transitive

147 **(b)**



(i) $A \cup B \cup C$ (ii) $A \cap B^c \cap C^c$ (iii) C^c

From figures (i), (ii) and (iii), we get

$(A \cup B \cup C) \cap (A \cap B^C \cap C^C) \cap C^C = (B^C \cap C^C)$

148 **(d)**

A relation on set A is a subset of $A \times A$

Let $A = \{a_1, a_2, \ldots, a_n\}$. Then, a reflexive relation on A must contain at least n elements $(a_1,a_1),(a_2,a_2),\ldots,(a_n,a_n)$

$\therefore$ Number of reflexive relations on A is 2^{n^2-n}

Clearly, $n^2 - n = n, n^2 - n = n - 1, n^2 - n = n^2 - 1$ have solutions in N but $n^2 - n = n + 1$ is not solvable in N.

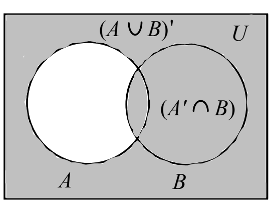
So, 2^{n+1} cannot be the number of reflexive relations on A

149 **(a)**

We have,
$A\,\Delta\,B=(A\cup B)-(A\cup B)$
$\Rightarrow n(A\,\Delta\,B)=n(A)+n(B)-2\,n(A\cap B)$
So, $n(A\,\Delta\,B)$ is greatest when $n(A\cap B)$ is least
It is given that $A\cap B\neq\phi$. So, least number of elements in $A\ \cap B$ can be one
$\therefore$ Greatest possible value of $n(A\,\Delta\,B)$ is $7+6-2\times 1=11$
150 **(d)**
Let $R=\{(x,y):y=ax+b\}$. Then,
$(-2,-7),(-1,-4)\in R$
$\Rightarrow -7=-2a+b$ and $-4=-a+b$
$\Rightarrow a=3, b=-1$
$\therefore y=3x-1$
Hence, $R=\{(x,y):y=3x-1,-2\leq x<3,x\in Z\}$
151 **(a)**
Let $\mathcal{U}$ be the set of all students in the school. Let C,H and B denote the sets of students who played cricket, hockey and basketball respectively. Then,
$n(\mathcal{U})=800, n(C)=224, n(H)=240, n(B)=336$
$n(H\cap B)=64, n(B\cap C)=80, n(H\cap C)=40$
and, $n(H\cap B\cap C)=24$
$\therefore$ Required number
$=n(C'\cap H'\cap B')$
$=n(C\cup H\cup B)'$
$=n(\mathcal{U})-n(C\cup H\cup B)$
$=n(\mathcal{U})-\{n(C)+n(H)+n(B)-n(C\cap H)-n(H\cap B)-n(B\cap C)+n(C\cap H\cap B)\}$
$=800-\{224+240+336+336-64-80-40+24\}$
$=800-640=160$
152 **(c)**
According to question,

$$2^m-2^n=48$$

This is possible only if $m=6$ and $n=4$.
153 **(a)**
From Venn-Euler's Diagram it is clear that



$(A\cup B)'\cup(A'\cap B)=A'$
154 **(b)**
For any $a,b\in R$
$a\neq b\Rightarrow b\neq a\Rightarrow R$ is symmetric
Clearly, $2\neq -3$ and $-3\neq 2$, but $2=2$. So, R is not transitive.
Clearly, R is not reflexive

155 **(a)**

We have,

$A \Delta B = (A \cup B) - (A \cup B)$

$\Rightarrow n(A \Delta B) = n(A) + n(B) - 2\, n(A \cap B)$

So, $n(A \Delta B)$ is greatest when $n(A \cap B)$ is least

It is given that $A \cap B \neq \phi$. So, least number of elements in $A \cap B$ can be one

$\therefore$ Greatest possible value of $n(A \Delta B)$ is $7 + 6 - 2 \times 1 = 11$

156 **(c)**

Since $x \nless x$, therefore R is not reflexive

Also, $x < y$ does not imply that $y < x$

So R is not symmetric

Let $x\, R\, y$ and $y\, R\, z$. Then, $x < y$ and $y < z. \Rightarrow x < z$ i.e. $x\, R\, z$

Hence, R is transitive

157 **(b)**

Number of elements common to each set is $99 \times 99 = 99^2$.

158 **(b)**

Given, $A \cap X = B \cap X = \phi$

$\Rightarrow A$ and X, B and X are disjoint sets.

Also, $A \cup X = B \cup X \Rightarrow A = B$

160 **(c)**

Clearly, R is reflexive and symmetric but it is not transitive

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