DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Solutions** **Subject : MATHS**
Date : **DPP No. :3**

Topic :-SETS

41 **(d)**

We have,

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

$\Rightarrow A \cap (A \cap B)^c = (A \cap A^c) \cup (A \cap B^c)$

$\Rightarrow A \cap (A \cap B)^c = \phi \cup (A \cap B^c) = A \cap B^c$

42 **(c)**

Since R is a reflexive relation on A.

$\therefore (a,a) \in R$ for all $a \in A$

$\Rightarrow n(A) \leq n(R) \leq n(A \times A) \Rightarrow 13 \leq n(R) \leq 169$

43 **(d)**

Clearly, R is reflexive symmetric and transitive. So, it is an equivalence relation

44 **(a)**

We have,

Required number of families

$= n(A' \cap B' \cap C')$

$= n(A \cup B \cup C)'$

$= N - n(A \cup B \cup C)$

$= 10000 - \{n(A) + n(B) + n(C) - n(A \cap B)\}$

$-n(B \cap C) - n(A \cap C) + n(A \cap B \cap C)\}$

$= 10000 - 4000 - 2000 - 1000 + 500 + 300 + 400 - 200$

$= 4000$

45 **(a)**

We have,

$A \subset A \cup B$

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

46 **(b)**

We have,

$(A \cup B) \cap B' = A$

$\therefore ((A \cup B) \cap B') \cup A' = A \cup A' = N$

48 **(b)**

The set A consists of all points on $y = e^x$ and the set B consists of points on $y = e^{-x}$, these two curves intersect at (0, 1). Hence, $A \cap B$ consists of a single point

50 **(b)**

Given, $A \cap B = A \cap C$ and $A \cup B = A \cup C$

$\Rightarrow \quad B = C$

51 **(d)**

Required number

$$= \frac{3^4 + 1}{2} = 41$$

52 **(b)**

Clearly, A is the set of all points on a circle with centre at the origin and radius 2 and B is the set of all points on a circle with centre at the origin and radius 3. The two circles do not intersect. Therefore,

$A \cap B = \phi \Rightarrow B - A = B$

53 **(c)**

We have,

$n(A^c \cap B^c)$

$= n\{(A \cup B)^c\}$

$= n(\mathcal{U}) - n(A \cup B)$

$= n(\mathcal{U}) - \{n(A) + n(B) - n(A \cap B)\}$

$= 700 - (200 + 300 - 100) = 300$

54 **(a)**

We have,

$\cos\theta > -\frac{1}{2}$ and $0 \le \theta \le \pi$

$\Rightarrow 0 \le \theta \le 2\pi/3$ and $0 \le \theta \le \pi$

$\Rightarrow 0 \le \theta \le \frac{2\pi}{3} \Rightarrow A = \{\theta : 0 \le \theta \le 2\pi/3\}$

Also,

$\sin\theta > \frac{1}{2}$ and $\pi/3 \le \theta \le \pi$

$\Rightarrow \frac{\pi}{3} \le \theta \le \frac{5\pi}{6} \Rightarrow B = \left\{\theta : \frac{\pi}{3} \le \theta \le \frac{5\pi}{6}\right\}$

$\therefore A \cap B = \left\{\theta : \frac{\pi}{3} \le \theta \le \frac{2\pi}{3}\right\}$ and $A \cup B = \left\{\theta : 0 \le \theta \le \frac{5\pi}{6}\right\}$

55 **(d)**

Clearly, R is an equivalence relation

56 **(c)**

Given, $A = \{1, 2, 3\}$, $B = \{a, b\}$

$\therefore \quad A \times B = \{(1, a), (1, b), (2, a), (2, b), (3, a), (3, b)\}$

57 **(b)**

Clearly,

$A_2 \subset A_3 \subset A_4 \subset \ldots \subset A_{10}$

$\therefore \bigcup_{n=2}^{10} A_n = A_{10} = \{2,3,5,7,11,13,17,19,23,29\}$

58 **(c)**

Clearly,

$R = \{(4,6),(4,10),(6,4),(10,4)(6,10),(10,6),(10,12),(12,10)\}$

Clearly, R is symmetric

$(6,10) \in R$ and $(10,12) \in R$ but $(6,12) \notin R$

So, R is not transitive

Also, R is not reflexive

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