Questions

Quetion: 01

Which one of the following is an infinite set?
A. The set of human beings on the earth
B. The set of water drops in a glass of water
C. The set of trees in a forest
D. The set of all primes

Quetion: 02

Consider the following statements

1. $\phi \in \{\phi\}$

2. $\{\phi\} \subseteq \phi$

Which of the statements given above is/are correct?

A. 1 only
B. 2 only
C. Both 1 and 2
D. Neither 1 nor 2

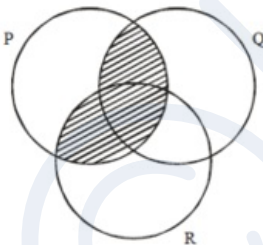**Quetion: 03**

If n(A) = 4, then find number of subsets of P(A).

A. 2^4

B. 2^8

C. 2^{16}

D. 2^{32}

Quetion: 04

What does the shaded region represent in the figure given below ?

A. $(P \cup Q) - (P \cap Q)$
B. $P \cap (Q \cap R)$
C. $(P \cap Q) \cap (P \cap R)$
D. $(P \cap Q) \cup (P \cap R)$

Quetion: 05

The set $A = \{x : x \in R, x^2 = 16 \text{ and } 2x = 6\}$ is
A. Null set.

B. Singleton set
C. Infinite set

D. not a well defined collection

Quetion: 06

If A = {2, 8} and B = {3, 4, 5}, find number of elements in A × B and B × A.
A. 12, 12
B. 6, 12
C. 12, 6

D. 6, 6

Quetion: 07

If $A = \{2, 3, 4, 8, 10\}, B = \{3, 4, 5, 10, 12\}, C = \{4, 5, 6, 12, 14\}$ then $(A \cap B) \cup (A \cap C)$ is equal to
A. {3, 4, 10}
B. {2, 8, 10}
C. {4, 5, 6}

D. {3, 5, 14}

Quetion: 08

If $n(A)$ denotes the number of elements in set A and if $n(A) = 4, n(B) = 5$ and $n(A \cap B) = 3$, then $n[(A \times B) \cap (B \times A)] =$

Solutions

Solution: 01

In the given sets, the set of all primes is an infinite set.
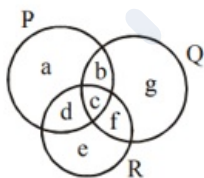
Solution: 02

Both statements are incorrect.

Solution: 03

$n(A) = 4 \Rightarrow n(P(A)) = 2^4 = 16$

Hence number of subsets of $P(A) = 2^{16}$

Solution: 04

The shaded region represents $(P \cap Q) \cup (P \cap R)$. Let the intersecting sets P, Q, R divide it into 7 regions marked, a to g as shown below.

The shaded part contains regions b, c, and d .
(a) $(P \cup Q) - (P \cap Q) \equiv$ $regions$ $a, b, c, d, f, g, - (b, c)$

$\equiv a, d, f, g, \cdot$ not $correct.$
[b] $(P \cap (Q \cap R) \equiv a, b, c, d, \cap c, f \equiv c$ not correct.
(c) $(P \cap Q) \cap (P \cap R) \equiv$ $regions$ $b, c, \cap$ $region, c, d \equiv c,$ so

not $correct$
[d] $(P \cap Q) \cup (P \cap R) \equiv$ regions $b, c, \cup c, d \equiv b, c, d$ so
correct.

Solution: 05

$A = \{x : x \in R, x^2 = 16$ and $2x = 6\}$
$x = 3$ and $x = \pm 4$
hence null set (no common terms)

Solution: 06

$A = \{2, 8\}, B = \{3, 4, 5\}$
$A \times B = \{(2, 3), (2, 4), (2, 5), (8, 3), (8, 4), (8, 5)\}$ clearly $A \times B \neq B \times A$
$B \times A = \{(3, 2), (3, 8), (4, 2), (4, 8), (5, 2), (5, 8)\}$
although $n(A \times B) = n(B \times A)$

Solution: 07

$A \cap B = \{3, 4, 10\}$ $A \cap C = \{4\}$
$(A \cap B) \cup (A \cap C) = \{3, 4, 10\}$

Solution: 08

Given $n(A) = 4, n(B) = 5, n(A \cap B) = 3$

$n[(A \times B) \cap (B \times A)] = n[(A \cap B) \times (B \cap A)]$

$= n(A \cap B) \times n(B \cap A) = 3 \times 3 = 9 \quad [\because n(A \times B) = n(A) \times n(B)]$

Correct Options

Answer:01
Correct Options: D
Answer:02
Correct Options: D
Answer:03
Correct Options: C
Answer:04
Correct Options: D
Answer:05
Correct Options: A
Answer:06
Correct Options: D
Answer:07
Correct Options: A
Answer:08
Correct Answer: 9