Sets

Q.No.1: Let A and B be two sets containing four and two elements respectively. Then the number of subsets of the set A × B, each having at least three elements is : **JEE 2015**

A. 219
B. 256
C. 275
D. 510

Q.No.2: Let $S = \{x \in \mathbf{R} : x \geq 0 \text{ and } 2|\sqrt{x} - 3| + \sqrt{x}(\sqrt{x} - 6) + 6 = 0\}$. Then S : **JEE 2018**

A. contains exactly two elements.
B. contains exactly four elements.
C. is an empty set.
D. contains exactly one element.

Q.No.3: Two sets A and B are as under :
A = {(*a*, *b*) ∈ **R** × **R** : |*a* – 5| < 1 and |*b* – 5| < 1};
B = {(*a*, *b*) ∈ **R** × **R** : $4(a-6)^2 + 9(b-5)^2 \leq 36$}. Then : **JEE 2018**

A. A ∩ B = ϕ (an empty set)
B. neither A ⊂ B nor B ⊂ A
C. B ⊂ A
D. A ⊂ B

Q.No.4: In a class of 140 students numbered 1 to 140, all even numbered students opted Mathematics course, those whose number is divisible by 3 opted Physics course and those whose number is divisible by 5 opted Chemistry course. Then the number of students who did not opt for any of the three courses is: **JEE 2019**

A. 102

B. 42

C. 1

D. 38

Q.No.5: Let S = {1, 2, 3, ..., 100}. The number of non-empty subsets A of S such that the product of elements in A is even is: **JEE 2019**

A. $2^{100} - 1$

B. $2^{50}(2^{50} - 1)$

C. $2^{50} - 1$

D. $2^{50} + 1$

Q.No.6: Let ***Z*** be the set of integers. If

$\mathrm{A} = \left\{x \in \boldsymbol{Z} : 2^{(x+2)\left(x^2-5x+6\right)} = 1\right\}$ and $\mathrm{B} = \{x \in \boldsymbol{Z} : -3 < 2x - 1 < 9\}$,

then the number of subsets of the set A × B, is: **JEE 2019**

A. 2^{15}

B. 2^{18}

C. 2^{12}

D. 2^{10}

Q.No.7: Let A,B and C be sets such that $\phi = \mathrm{A} \cap \mathrm{B} \subseteq \mathrm{C}$. Then which of the following statements is not true? **JEE 2019**

A. $\mathrm{B} \cap \mathrm{C} \neq \phi$

B. If $(\mathrm{A} - \mathrm{B}) \subseteq \mathrm{C}, \text{then } \mathrm{A} \subseteq \mathrm{C}$

C. $(\mathrm{C} \cup \mathrm{A}) \cap (\mathrm{C} \cup \mathrm{B}) = \mathrm{C}$

D. If $(\mathrm{A} - \mathrm{C}) \subseteq \mathrm{B}, \text{ then } \mathrm{A} \subseteq \mathrm{B}$

Q.No.8: Let X = {n ∈ N : 1 ≤ n ≤ 50}. If A = {n ∈ X : n is a multiple of 2} and B = {n ∈ X : n is a multiple of 7}, then the number of elements in the smallest subset of X containing both A and B is _____. **JEE 2020**

Q.No.9:

Let $A = \{n \in N : \ n \ is \text{ a } 3 \text{ digit number}\}$

$B = \{9k + 2 : \ k \in N\}$

and $C = \{9k + l : \ k \in N\}$ for some l $(0 < l < 9)$

If the sum of all the elements of the set $A \cap (B \cup C)$ is $274 \times 400,$ then l is equal

JEE 2021

Q.No.10: The total number of 4-digit numbers whose greatest common divisor with 18 is 3, is _____. **JEE 2021**