# ©゙doubtnut 

India's Number 1 Education App

## MATHS

## BOOKS - DISHA PUBLICATION MATHS (HINGLISH)

## SETS

## Jee Main 5 Years At A Glance

1. 

$S=\{x \in R: x \geq 0$ and $2 \mid(\sqrt{x}-3 \mid+\sqrt{x}(\sqrt{x}-6)+6=0\}$
then $S$ (1) is an empty set (2) contains exactly one element (3) contains
exact;y two elements (4) contains exactly four elements
A. contains exactly one element.
B. contains exactly two elements
C. contains exactly four elements
D. is an empty set

## Answer: B

## ( Watch Video Solution

2. If $f(x)+2 f\left(\frac{1}{x}\right)=3 x, x \neq 0$ and
$S=\{x \in R: f(x)=f(-x)\}$, then $S$
A. contains exactly two elements
B. contains more than two elements
C. is an empty set
D. contains exactly one element

## Answer: A

## - Watch Video Solution

3. 

$P=\{\theta: \sin \theta-\cos \theta=\sqrt{2} \cos \theta\}$ and $Q=\{\theta: \sin \theta+\cos \theta=\sqrt{2} \sin \theta\}$ be two sets. Then
A. $P \subset Q$ and $Q-P \neq \phi$
B. $Q \subset P$
C. $P=Q$
D. $P \nearrow Q$

## Answer: C

## - Watch Video Solution

4. In a certain town, $25 \%$ of the families own a phone and $15 \%$ own a car, 65\% families own neither a phone nor a car and 2,000 families own both a car and a phone. Consider the following three statements :
(A) $5 \%$ families own both a car and a phone
(B) $35 \%$ families own either a car or a phone
(C ) 40,000 families live in the town

Then,
A. Only (A) and (C ) are correct
B. Only (B) and (C ) are correct
C. All (A), (B) and (C ) are correct
D. Only (A) and (B) are correct

## Answer: C

## - Watch Video Solution

5. The relation on the set $A=\{x|x|<3, x, \in Z\}$ is defined by $R=\{(x, y) ; y=|x|, x \neq-1\}$, Then the numbers of elements in the power set of $R$ is
A. 32
B. 16
C. 8
D. 64

## Answer: B

## - Watch Video Solution

6. Let $X=\{1,2,3,4,5\}$. The number of different ordered pairs ( $\mathrm{Y}, \mathrm{Z}$ ) that can be formed such that $Y \subseteq X, Z \subseteq X$ and $Y \cap Z$ is empty, is (1)
$5^{2}(2) 3^{5}(3) 2^{5}(4) 5^{3}$
A. $5^{2}$
B. $3^{5}$
C. $2^{5}$
D. $5^{3}$

## Answer: B

## - Watch Video Solution

7. If $\mathrm{A}, \mathrm{B}$ and C are three sets such that $A \cap B=A \cap C$ and $A \cup B=A \cup C$, then (1) $A=B$ (2) $A=C$ (3) $B=C$ (4) $A \cap B=\varphi$
A. $A=C$
B. $B=C$
C. $A \cap B=\phi$
D. $A=B$

## Answer: B

## - Watch Video Solution

## Exercise 1 Concept Builder

1. If $A=\{a, b, c\}$, then what is the number of proper subsets of $A$ ?
A. 3
B. 8
C. 6
D. 7

## Answer: D

## - Watch Video Solution

2. Consider the following sets.
I. $A=\{1,2,3\}$
II. $B=\left\{x \in R: x^{2}-2 x+1=0\right\}$
III. $C=\{1,2,2,3\}$
IV. $D=\left\{x \in R: x^{3}-6 x^{2}+11 x-6=0\right\}$

Which of the following are equal?
A. $A=B=C$
B. $A=C=D$
C. $A=B=D$
D. $B=C=D$

## Answer: B

## D Watch Video Solution

3. Two finite sets have $m$ and $n$ elements. The total number of subsets of the first set is 56 more than the total number of subsets of the second set. The value of $m$ and $n$ is
A. 7, 6
B. 6,3
C. 5,1
D. 8,7

## Answer: B

4. Let $A$ and $B$ be two non empty subsets of set $X$ such that $A$ is not a subset of $B$, then: (a) $A$ is a subset of the complement of $B$ (b) $B$ is $a$ subset of $A$ (c) $A$ and $B$ are disjoint (d) $A$ and the complement of $B$ are non-disjoint
$A . A$ is a subset of the complement of $B$
$B . B$ is a subset of $A$
C. $A$ and $B$ are disjoint
D. $A$ and the complement of $B$ are non-disjoint

## Answer: D

## - Watch Video Solution

5. If $A=\{x, y\}$, then the power set of $A$ is
A. $\left\{x^{y}, y^{x}\right\}$
B. $\{\phi, x, y\}$
C. $\{\phi,\{x\},\{2 y\}\}$
D. $\{\phi,\{x\},\{y\},\{x, y\}\}$

## Answer: D

## - Watch Video Solution

6. Given the sets $A=\{1,3,5\}, B=\{2,4,6\}$ and $C=\{0,2,4,6,8\}$, which of the following may be considered as universal set(s) for all the three sets $A, B$ and $C$ ?
(i) $\{0,1,2,3,4,5,6\}$
(ii) $\phi$
(iii) $\{0,1,2,3,4,5,6,7,8,9,10\}$
(iv) $\{1,2,3,4,5,6,7,8\}$.
A. $\{0,1,2,3,4,5,6\}$
B. $\phi$
C. $\{0,1,2,3,4,5,6,7,8,9,10\}$
D. $\{1,2,3,4,5,6,7,8\}$

## Answer: C

## - Watch Video Solution

7. Find the pairs of equal sets from the following sets, if any, giving reasons:
$A=\{0\}, B=\{x: x>15$ and $x<5\}, C=\{x: x-5=0\}, D=\left\{x: x^{2}\right.$
$E=\{x: x$ is an integral positive root of the equation $\left.x^{2}-2 x-15=0\right\}$.
A. A and B
B. C and D
C. C and E
D. B and C

## Answer: C

8. Let $A=\{1,3,5\}$ and $\mathrm{B}=\{x: x$ is an odd natural number less than 6$\}$. Then, which of the following are true?
I. $A \subset B$ II. $B \subset A$
III. $A=B$ IV. AB
A. I and II are true
B. I and III are true
C. I, II and III are true
D. I, II and IV are true

## Answer: C

## - View Text Solution

9. the collection of intellgent students in a class is :
A. A null set
B. A singleton set
C. A finite set
D. Not a well defined collection

## Answer: D

## - Watch Video Solution

10. If $A=\{1,2,(3,4), 5\}$, then which of the following statements is incorrect?
A. $(3,4)$ is an element of $A$
B. $\{5\},\{(3,4)\}$ are subsets of $A$
C. $\{1,2\},\{5\}$ are subsets of $A$
D. $\{(1,2),(3,4), 5\}$ is subset of $A$

## Answer: C

11. State which of the following sets are finite sets or infinite. In case of finite set, mention the order of cardinal number
(i) $A=(\mathrm{x}: \mathrm{x}$ is a prime number and $x<15)$
(ii) $B=(x: x \in N$, and $3 x+2=11)$
(iii) $C=\left(x: x \in N\right.$ and $\left.x^{2}-14 x+3=0\right)$
(iv) $D=(1,2,3,4 \ldots)$

## - Watch Video Solution

12. Which of the following statement is FALSE
A. If $A=\left\{x: x^{2}=4, x \in N\right\}, B=\{-2\}$ then $A \neq B$
B. If $A=\{x:|x|<2, x \in I\}, B=\{-1,1\}$, then $\mathrm{A}=\mathrm{B}$
C. If $A=\{1,2,3,4,5\}, B=\{2,1,3,3,4,4,5\}$ then $\mathrm{A}=\mathrm{B}$
D. If $A=\left\{x: x^{2}-5 x+7=0, x \in R\right\}$ and $B=\phi$, then $\mathrm{A}=\mathrm{B}$

## Answer: B

13. The set $\left\{\mathrm{x}: \mathrm{x}\right.$ is a positive integer less than 6 and $3^{x}-1$ is an even number\} in roster form is
A. $\{1,2,3,4,5\}$
B. $\{1,2,3,4,5,6\}$
C. $\{2,4,6\}$
D. $\{1,3,5\}$

## Answer: A

## - Watch Video Solution

14. The cardinality of the set $P\{P[P(\phi)]\}$ is
A. 0
B. 1
C. 2
D. 4

## Answer: D

## - Watch Video Solution

15. The number of elements in the set $\left\{(a, b): 2 a^{2}+3 b^{2}=35 . a . b \in Z\right\}$ ,where $Z$ is the set of all integers, is
A. 2
B. 4
C. 8
D. 12

## Answer: C

16. If $A=\left\{x: x=n^{2}, n=1,2,3\right\}$, then number of proper subsets is
A. 3
B. 8
C. 7
D. 4

## Answer: C

17. Let $\mathrm{A}, \mathrm{B}, \mathrm{C}$ be three sets. If $A \in B$ and $B \subset C$ then
A. $A \subset C$
B. $A \subset C$
C. $A \in C$
D. $A \not \subset C$

## - View Text Solution

18. Let $V=\{a, \quad e, \quad i, \quad o, u\} \quad$ and
$B=\{a, \quad i, \quad k, \quad u\}$. Find $V \quad B$ and $\quad B \quad V$
A. $\{e, o\}$ and $\{k\}$
B. $\{e\}$ and $\{k\}$
C. $\{o\}$ and $\{k\}$
D. $\{e, o\}$ and $\{k, i\}$

## Answer: A

## - Watch Video Solution

19. If $P=\{x \in R: f(x)=0\}$ and $Q=\{x \in R: g(x)=0\}$, then $P \cup Q$ is
A. $\{x \in R: f(x)+g(x)=0\}$
B. $\{x \in R: f(x) g(x)=0\}$
C. $\left\{x \in R:(f(x))^{2}+(g(x))^{2}=0\right\}$
D. None of these

## Answer: B

## - Watch Video Solution

20. If $A=\{1,2,3,4\}, B=\{2,3,5,6\}$ and $C=\{3,4,6,7\}$, then
A. $A-(B \cap C)=\{1,3,4\}$
B. $A-(B \cap C)=\{1,2,4\}$
C. $A-(B \cap C)=\{2,3\}$
D. $A-(B \cap C)=\{\phi\}$

## Answer: B

21. If the set $A$ and $B$ are as follows :
$A=\{1,2,3,4\}, B=\{3,4,5,6\}$, then
A. $A-B=\{1,2\}$
B. $B-A=\{5\}$
C. $[(A-B)-(B-A)] \cup A=\{1,2\}$
D. $[(A-B)-(B-A)] \cup A=\{3,4\}$

## Answer: A

## - View Text Solution

22. Consider the following relations :
23. $A-B=A-(A \cap B)$
24. $A=(A \cap B) \cup(A-B)$
$3 . A-(B \cup C)=A(A-C) \cup(A-C)$
which of these is/are correct
A. I and III
B. I and II
C. Only II
D. II and III

## Answer: B

## - Watch Video Solution

23. If $A=\{x \in R: 0<x<3\}$ and $B=\{x \in R: 1 \leq x \leq 5\}$ then $A \Delta B$ is
A. $\{x \in R: 0<x<1\}$
B. $\{x \in R: 3 \leq x \leq 5\}$
C. $\{x \in R: 0<x<1$ or $3 \leq x \leq 5\}$
D. $\phi$

## Answer: C

24. Let $X$ and $Y$ be two non-empty sets such that $X \cap A=Y \cap A=\phi$ and $X \cup A=Y \cup A$ for some non-empty set A. Then
A. $X$ is a proper subset of $Y$
B. $Y$ is a proper subset of $X$
C. $X=Y$
D. $X$ and $Y$ are disjoint sets

## Answer: C

## Watch Video Solution

25. The set $(A / B) \cup(B / A)$ is equal to
A. $[A /(A \cap B)] \cap[B /(A \cap B)]$
B. $(A \cup B) /(A \cap B)$
C. $A /(A \cap B)$
D. $\overline{A \cap B} / A \cup B$

## Answer: B

## - View Text Solution

26. if $A=\{x: x$ is a multiple of 3$\}$ and ,
$B=\{x: x$ is a multiple of 5$\}$, then $\mathrm{A}-\mathrm{B}$ is
A. $\bar{A} \cap B$
B. $A \cap \bar{B}$
c. $\bar{A} \cap \bar{B}$
D. $\overline{A \cap B}$

## Answer: B

27. If $A$ and $B$ are two sets prove that $A \cap(B-A)=\phi$
A. $\phi$
B. A
C. B
D. None of these

## Answer: A

## Watch Video Solution

28. Each student in a class of 40, studies at least one of the subjects English, Mathematics and Economics. 16 study English, 22 Economics and 26 Mathematics, 5 study English and Economic, 14 Mathematics and Economics and 2 study all the three subjects. The number of students who study English and Mathematics but not Economics is
A. 7
B. 5
C. 10
D. 4

## Answer: B

## D Watch Video Solution

29. If A and B are two sets, then $(A \cup B)^{\prime} \cup\left(A^{\prime} \cap b\right)$ is equal to
A. $A^{\prime}$
B. A
C. $B^{\prime}$
D. None of these

## Answer: A

30. If $A=\{1,2,5\}$ and $B=\{3,4,5,9\}$, then $A \Delta B$ is equal to
A. $\{1,2,5,9\}$
B. $\{1,2,3,4,9\}$
C. $\{1,2,3,4,5,9\}$
D. None of these

## Answer: B

## - View Text Solution

31. Let $X=\{$ Rani, Geeta, Akbar\} be the set of students of Class XI who are in school hockey team. Let $Y=\{$ Geeta, David, Ashok $\}$ be the set of students from Class $X I$ who are in the school football team. Find $X \cup Y$ and interpret the set
A. \{Ram, Geeta\}
B. $\{\operatorname{Ram}\}$
C. \{Geeta\}
D. None of these

## Answer: C

## - Watch Video Solution

32. Let $A=\{3,6,9,12,15,18,21\}$
$B=\{4,8,12,16,20\}$
$C=\{2,4,6,8,10,12,14,16\}$
and $D=\{5,10,15,20\}$
Which of the following is incorrect?
I. $A-B=\{4,8,16,20\}$
II. $(C-B) \cap(D-B)=\phi$
III. $B-C \neq B-D$
A. Only I and II
B. Only II \& III
C. Only III \& I
D. None of these

## Answer: A

## - View Text Solution

33. Out of 800 boys in a school, 224 played cricket, 240 played hockey and 336 played basketball. Of the total, 64 played both basketball and hockey; 80 played cricket and basketball and 40 played cricket and hockey; 24 played all the three games. The number of boys who did not play any game is
A. 128
B. 216
C. 240
D. 160

## Answer: D

## (D) Watch Video Solution

34. Let $A=\{(n, 2 n): n \in N\}$ and $B=\{(2 n, 3 n): n \in N\}$. What is $A \cap B$ equal to ?
A. $\{(n, 6 n): n \in N\}$
B. $\{(2 n, 6 n): n \in N\}$
C. $\{(n, 3 n): n \in N\}$
D. $\phi$

## Answer: D

## - Watch Video Solution

35. If $A$ is the set of all divisors of the number 15 . $B$ is the set of prime numbers smaller than 10 and $C$ is the set of even number smaller than 9 , then find the value of $(A \cup C) \cap B$
A. $\{1,3,5\}$
B. $\{1,2,3\}$
C. $\{2,3,5\}$
D. $\{2,5\}$

## Answer: C

## - Watch Video Solution

36. let $\mu=$ the set of all triangles, $\mathrm{P}=$ the set of all isosceles triangles, $\mathrm{Q}=$ the set of all equilateral triangles, $\mathrm{R}=$ the set of all right-angled triangles.

What do the sets $P \cap Q$ and R-P represents respectively ?
A. The set of isosceles triangles, the set of non-isosceles right angled triangles
B. The set of isosceles triangles, the set of right angled triangles
C. The set of equilateral triangles, the set of right angled triangles
D. The set of isosceles triangles, the set of equilateral triangles

## D Watch Video Solution

37. If $U=\{1,2,3,4,5,6,7,8,9,10\}, A=\{1,2,3,5\}, B=2,4,6,7\}$ and $C=\{2,3,4,8\}$. Then
(i) $(B \cup C)^{\prime}$ is $\ldots \ldots \ldots$, (ii) $(C-A)^{\prime}$ is $\ldots \ldots \ldots$.
A. $(B \cup C)^{\prime}=\{1,5,9,10\}$
B. $(C-A)^{\prime}=\{1,2,3,5,6,7,9,10\}$
C. Both (a) and (b)
D. None of these

## Answer: C

38. if a $\mathrm{N}=\{a x: x i \in N\}$ and $b N \cap c N$, where $\mathrm{b}, \mathrm{c}$ in N'are relatively prime, then
A. $d=b c$
B. $c=b d$
C. $b=c d^{\prime}$
D. None of these

## Answer: A

## - Watch Video Solution

39. Let $n(U)=700, n(A)=200, n(B)=300$ and $n(A \cap B)=100$, then find $n\left(A^{\prime} \cap B^{\prime}\right)$
A. 400
B. 600
C. 300
D. None of these

## Answer: C

## - Watch Video Solution

40. A market research group conducted a survey of 2000 consumers and reported that 1720 consumers liked product $P_{1}$ and 1450 consumers like product $P_{2}$. What is the least number that must have liked both the products?
A. 1150
B. 2000
C. 1170
D. 2500

## Answer: C

41. In a college of 300 students, every student reads 5 newspapers and every newspaper is read by 60 students. The number of newspaper is -
A. at least 30
B. at most 20
C. exactly 25
D. None of these

## Answer: C

## - Watch Video Solution

42. In a class of 55 students, the number of students studying different subjects are 23 in Mathematics, 24 in Physics, 19 in Chemistry, 12 in Mathematics and Physics, 9 in Mathematics and Chemistry, 7 in Physics and Chemistry and 4 in all the three subjects. Find the number of students who have taken exactly one subject.
A. 6
B. 9
C. 7
D. All of these

## Answer: D

## - Watch Video Solution

43. In a battle, $70 \%$ of the combatants lost one eye, $80 \%$ an are, $75 \%$ an arem. $85 \%$ a leg, and $x \%$ lost all the four organs. Then minimum value of $x$ is
A. 10
B. 12
C. 15
D. None of these

## D Watch Video Solution

44. In a city 20 percent of the population travels by car, 50 percent travels by bus and 10 percent travels by both car and bus. Then persons travelling by car or bus is
A. 80 percent
B. 40 percent
C. 60 percent
D. 70 percent

## Answer: C

45. In a town of 10,000 families it was found that $40 \%$ family buy newspaper A, $20 \%$ buy newspaper B and $10 \%$ families buy newspaper C, $5 \%$ families buy A and B, $3 \%$ buy B and C and $4 \%$ buy A and C. If $2 \%$ families buy all the three newspapers, then find the number of families which buy A only
A. 4400
B. 3300
C. 2000
D. 500

## Answer: B

## - Watch Video Solution

46. A class has 175 students. The following data shows the number of students obtaining one or more subjects. Mathematics 100, Physics 70 , Chemistry 40, Mathematics and Physics 30, Mathematics and Chemistry

28, Physics and Chemistry 23, Mathematics, Physics and Chemistry 18. How many students have offered Mathematics alone (a) 35 (c) 60 (b) 48 (d) 22
A. 35
B. 48
C. 60
D. 22

## Answer: C

## - Watch Video Solution

47. There are 20 students in a chemistry class and 30 students in a physics class. If ten students are to be enrolled in both the courses, then the number of students which are either in physics class or chemistry class is
A. 50 , if two classes meet at the same hour
B. 40 , if two classes meet at different hours
C. both (a) and (b) correct
D. (a) correct but (b) incorrect

## Answer: C

## - Watch Video Solution

48. In a statistical investigation of 1003 families of Calcutta, it was found that 63 families has neither a radio nor a T.V, 794 families has a radio and 187 has T.V. The number of families in that group having both a radio and a T.V is
A. 36
B. 41
C. 32
D. None of these

## Answer: B

49. If A and B are two sets, then $(A \cup B)^{\prime} \cup\left(A^{\prime} \cap b\right)$ is equal to
A. $A^{c}$
B. $B^{c}$
C. A
D. None of these

## Answer: A

## - Watch Video Solution

50. 60 employees in an office were asked about their preference for tea and coffee. It was observed that for every 3 people who prefer tea, there are 2 who prefer coffee. For every 6 people who prefer tea, there are 2 who drink both of tea and coffee. For every 6 people who prefer tea, there are 2 who drink both of tea and coffee. The number of people who drink
both is the same as those wo drink neither. How many people drink both tea adn coffee?
A. 10
B. 12
C. 14
D. 16

## Answer: B

## - View Text Solution

51. A market research group conducted a survey of 1000 consumers and reported that 720 consumers like product $A$ and 450 consumers like product $B$. what is the least number that must have liked both products?
A. 170
B. 280
C. 220
D. None

## Answer: A

## - Watch Video Solution

52. In a class of 30 students 12 take needle work, 16 take physics and 18 take history. If all the 30 students take at least one subject and no one takes all three, then the number of students taking 2 subjects is
A. 16
B. 6
C. 8
D. 20

## Answer: A

## - Watch Video Solution

53. Out of 1000 boys in a college, 220 played cricket, 250 played hockey and 350 played basketball. Of the total 80 played both basketball and hockey, 100 played cricket and basketball and 50 played cricket and hockey, 30 played all three games. The number of boys who play atleast one game is :
A. 500
B. 590
C. 600
D. 620

## Answer: D

## - Watch Video Solution

54. If X and Y are two sets such that $(X \cup Y)$ has 60 elements, X has 38 elements and $Y$ has 42 elements, how many elements does $(X \cap Y)$ have?
A. 11
B. 20
C. 13
D. None of these

## Answer: B

## - Watch Video Solution

55. In a town of 840 persons, 450 persons read Hindi, 300 read English and 200 read both. Then, the number of persons who read neither, is
A. 210
B. 290
C. 180
D. 260

## Answer: B

56. In a B School there are 15 teachers who teach marketing or finance. Of these, 8 teach finance and 4 teach both marketing and finance. How many teach marketing but not finance?
A. 15
B. 20
C. 11
D. None of these

## Answer: C

## - View Text Solution

57. In a school there are 100 students 60 of them don't like Chocolate and 50 don't like Biscuit and 10 of them like none then how many of them like both?
A. 20
B. 30
C. 40
D. None of these

## Answer: D

## - Watch Video Solution

## Exercise 2 Concept Applicator

1. In a market research project $20 \%$ opted for Nirma detergent whereas $60 \%$ opted for surf Blue detergent. The remaining individual as ere not certain. If the difference between those who opted for surf blue and those who were uncertain as 720 , how many respondents were covered in the surveys? 1440 b. 3600 c. 1800 d. Data inadequate
A. 1100
B. 1150
C. 1800
D. None of these

## Answer: C

## - Watch Video Solution

2. If $X=\{1,2,3, \ldots ., 10\}$ and 'a' represents any element of $X$, then the set containing all the elements satisfy $a+2=6, a \in X$ is
A. $\{4\}$
B. $\{3\}$
C. $\{2\}$
D. $\{5\}$

## Answer: A

3. Let A, B, C be finite sets. Suppose that $n(A)=11, n(B)=16, n(C)=21, n(A \cap B)=9$ and $n(B \cap C)=10$
.Then the possible value of $n(A \cup B \cup C)$ is
A. 27
B. 28
C. 29
D. Any of the three values $27,28,29$ is possible

## Answer: D

## - View Text Solution

4. Which of the following in a null set :
A. $\{0\}$
B. $\{x: x>0$ or $x<0\}$
C. $\left\{x: x^{2}=4\right.$ or $\left.x=3\right\}$
D. $\left\{x: x^{2}+1=0, x \in R\right\}$

## Answer: D

## - Watch Video Solution

5. 

$A=[x: x \in R,|x|<1] ; B=[x: x \in R,|x-1| \geq 1]$ and $A \cup B=R-$
,then the set $D$ is
A. $\{x: 1<x \leq 2\}$
B. $\{x: 1 \leq x<2\}$
C. $\{x: 1 \leq x \leq 2\}$
D. None of these

## Answer: B

6. Let $F_{1}$ be the set of parallelograms, $F_{2}$ the set of rectangle, $F_{3}$ the set of rhombuses, $F_{4}$ the set of squares and $F_{5}$ the set of trapeziums in a plane. Then, $F_{1}$ may be equal to
A. $F_{2} \cap F_{3}$
B. $F_{3} \cap F_{4}$
C. $F_{2} \cup F_{5}$
D. $F_{2} \cup F_{3} \cup F_{4} \cup F_{1}$

## Answer: D

## - Watch Video Solution

7. Which is the simplified representation of $\left(A^{\prime} \cap B^{\prime} \cap C\right) \cup(B \cap C) \cup(A \cap C)$ where $\mathrm{A}, \mathrm{B}$ and C are subsets of set X?
A. A
B. B
C. C
D. $X \cap(A \cup B \cup C)$

## Answer: C

## - Watch Video Solution

8. If $A=\{a,\{b\}\}$, then $\mathrm{P}(\mathrm{A})$ equals.
A. $\{\phi,\{a\},\{\{b\}\},\{a,\{b\}\}\}$
B. $\{\phi,\{a\}\}$
C. $\{\{a\},\{b\}, \phi\}$
D. $\{\{b\},\{a, b\}\}$

## Answer: A

9. If $n(A)=4$ and $n(B)=7$, then the difference between maximum and minimum value of $n(A \cup B)$ is
A. 1
B. 2
C. 3
D. 11

## Answer: D

## - Watch Video Solution

10. At a certain conference of 100 people, there are 29 Indian women and 23 Indian men. Of these Indian people 4 are doctors and 24 are either men or doctors. There are no foreign doctors. How many foreigners and women doctors are attending the conference?
A. 48,1
B. 34,3
C. 46,4
D. 42,2

## Answer: A

## D Watch Video Solution

11. In a certain town $25 \%$ families own a phone and $15 \%$ own a car $65 \%$ own neither a phone nor a car. 2000 families own both a car and a phone.

Consider the following statements in this regard
(1) $10 \%$ families own both a car and a phone
(2) $35 \%$ families own neither a car or a phone
(3) 40,000 families live in the town

Which one of these statements are correct?
A. 1 and 2
B. 1 and 3
C. 2 and 3
D. $1,2 \& 3$

## Answer: C

## - Watch Video Solution

12. The number of elements in the set
$\left\{(a, b): 2 a^{2}+3 b^{2}=83, a, b \in Z\right\}$, where $Z$ is the set of all integers, is
A. 2
B. 4
C. 8
D. 12

## Answer: B

13. Let N be the set of non-negative integers, I the set of integers, $N_{p}$ the set of non-positive integers, $E$ the set of even integers and $P$ the set of prime numbers. Then
A. $I-N=N_{p}$
B. $N \cap N_{p}=\phi$
C. $E \cap P=\phi$
D. $N \Delta N_{p}=I-\{0\}$

## Answer: D

## - View Text Solution

14. In a survey of 400 students in a school, 100 were listed as taking apple juice, 150 as taking orange juice and 75 were listed as taking both apple as well as orange juice. Then, which of the following is/are true?
I. 150 students were taking at least one juice.
II. 225 students were taking neither apple juice nor orange juice.
A. Only I is true
B. Only II is true
C. Both I and II are true
D. None of these

## Answer: B

## - View Text Solution

15. Universal set $U=\left\{x \mid x^{5}-6 x^{4}+11 x^{3}-6 x^{2}=0\right\}$ $A=\left\{x \mid x^{2}-5 x+6=0\right\} \quad B=\left\{x \mid x^{2}-3 x+2=0\right\} \quad$ What $\quad$ is $(A \cap B)$ 'equal to?
A. 2
B. 3
C. 4
D. 5

## - Watch Video Solution

16. In a school 80 students like chocolate, 40 like coffee if the number of students doesn't like any of them is equal to the number of students who like both of them then what is the total number of students in the school?
A. 115
B. 90
C. 120
D. None of these

## Answer: C

17. Let $U$ be the universal set for sets $A$ and $B$ such that $n(A)=200, n(B)=300$ and $n(A \cap B)=100$. then $a\left({ }^{\prime} \cap B^{\prime}\right)$ is equal to 300 , provided that $n(U)$ is equal to
A. 600
B. 700
C. 800
D. 900

## Answer: B

## - Watch Video Solution

18. One of the partitions of the set $\{1,2,5, x, y, \sqrt{2}, \sqrt{3}\}$ is
A. $\{\{1,2, x\},(x, 5, y\},\{\sqrt{2}, \sqrt{3}\}\}$
B. $\{\{1,2, \sqrt{2}\},\{x, y, \sqrt{2}\},\{5, \sqrt{2}, \sqrt{3}\}\}$
C. $\{\{1,2\},\{5, x\},\{\sqrt{2}, \sqrt{3}\}\}$
D. $\{\{1,2,5\},\{x, y\},\{\sqrt{2}, \sqrt{3}\}\}$

Answer: D

## - View Text Solution

19. Let $A, B$ and $C$ be finite sets such that $A \cap B \cap C=\phi$ and each one of the sets $A \Delta B, B \Delta C$ and $C \Delta A$ has 200 elements. The number of elements is $A \cup B \cup C$ is
A. 250
B. 200
C. 150
D. 300

## Answer: C

## - Watch Video Solution

20. A town has total population of 25,000 out of which 13,000 read "The Times of India" and 10,500 read "The Hindustan Times". 2,500 read both papers. The percentage of population who read neither of these newspapers is
A. 16
B. 18
C. 20
D. 25

## Answer: A

## - View Text Solution

21. 

$n(A)=1000, n(B)=500$ and $\quad$ if $n(A \cap B) \geq 1$ and $n(A \cup B)=p$
, then
A. $500 \leq p \leq 1000$
B. $1001 \leq p \leq 1498$
C. $1000 \leq p \leq 1498$
D. $1000 \leq p \leq 1499$

## Answer: D

## - Watch Video Solution

22. Let $U=R$. If $A=\{x \in R: 0<x<2\}, B=\{x \in R: 1<x \leq 3\}$, Which of the following is false?
A. $A^{\prime}=\{x \in R: x \leq 0$ or $x \geq 2\}$
B. $B^{\prime}=\{x \in R: x \leq 1$ or $x>3\}$
C. $A \cup B=\{x \in R: 0 \leq x \leq 3\}$
D. $A \cup B=\{x \in R: 1<x<2\}$

## Answer: C

23. If $X=\{1,2,3,4,5,6,7,8,9\}, A=\left\{x \in N: 30<x^{2}<70\right\}$, $\mathrm{B}=\{\mathrm{xx}$ is a prime number less thean 10$\}$, then which of the following is false?
A. $A \cup B=\{2,3,5,6,7,8\}$
B. $A \cap B=\{7,8\}$
C. $A-B=\{6,8\}$
D. $A \Delta B=\{2,3,5,6,8\}$

## Answer: B

## - Watch Video Solution

24. Which of the following is not correct? 1 ) $A \subseteq A^{c}$ if and only if $A=\phi$ 2) $A^{c} \subseteq A$ if and only if $\mathrm{A}=\mathrm{X}$, where X is a universal set 3)If $\mathrm{A} \mathrm{UB}=\mathrm{A}$ UC , then $\mathrm{B}=\mathrm{C} 4) \mathrm{A}=\mathrm{B}$ is equivalent to $\mathrm{AUC}=\mathrm{BUC}$ and $A \cap C=B \cap C$
A. $A \subseteq A^{\prime}$ if and only if $A=\phi$
B. $A^{\prime} \subseteq A$ if and only if $\mathrm{A}=\mathrm{X}$, where X is the universal set
C. if $A \cup B=A \cup C$, then $\mathrm{B}=\mathrm{C}$
D. $\mathrm{B}=\mathrm{C}$ if and only if $A \cup B=A \cup C$ and $A \cap B=A \cap C$

## Answer: C

## - Watch Video Solution

25. Let $R$ be set of points inside a rectangle of sides $a$ and $b(a, b>1)$ with two sides along the positive direction of $x$-axis and $y$-axis
A. $R=\{(x, y): 0 \leq x \leq a, 0 \leq y \leq b\}$
B. $R=\{(x, y): 0 \leq x<a, 0 \leq y \leq b\}$
C. $R=\{(x, y): 0 \leq x \leq a, 0<y<b\}$
D. $R=\{(x, y): 0<x<a, 0<y<b\}$

## Answer: D

26. If $X=\left\{8^{n}-7 n-1: n \in N\right\}$ and $Y=\{49(n-1): n \in N\}$, then
A. $X \subset Y$
B. $Y \subset X$
C. $X=Y$
D. $X \cap Y=\phi$

## Answer: A

View Text Solution
27. Suppose $A_{1}, A_{2} \ldots . A_{30}$ are thirty sets each having 5 elements and $B_{1} B_{2} \ldots . B_{n}$ are n sets each having 3 elements , Let $\bigcup_{i=1}^{30} A_{1}=\bigcup_{j=1}^{n} B_{j}=s$
and each element of S belongs to exactly 10 of the $A_{1}$ and exactly 9 of the value of $n$.
A. 15
B. 3
C. 45
D. 35

## Answer: C

## - Watch Video Solution

28. The number of students who take both the subjects mathematics and chemistry is 30 . This represents $10 \%$ of the enrolment in mathematics and $12 \%$ of the enrolment in chemistry. How many students take at least one of these two subjects?
A. 520
B. 490
C. 560
D. 480

## (D) Watch Video Solution

29. If set $A$ and $B$ are defined as
$A=\left\{(x, y) \left\lvert\, y=\frac{1}{x}\right., 0 \neq x \in R\right\}, B=\{(x, y) \mid y=-x, x \in R\}.$,
Then
A. $A \cap B=A$
B. $A \cap B=B$
C. $A \cap B=\phi$
D. $A \cup B=A$

## Answer: C

## - Watch Video Solution

30. If $S=\{x \mid x$ is a positie multiple of 3 les than 100$\}$ and $P=\{x \mid x$ is a prime number less than 20$\}$. Then , $n(S)+n(P)$ is equal to
A. 34
B. 31
C. 33
D. 41

## Answer: D

## - Watch Video Solution

