



## MATHS

### BOOKS - DEEPTI MATHS (TELUGU ENGLISH)

#### SETS ( APPENDIX - 1)

#### Exercise

1. Which of the following is an empty set

A.  $\{\emptyset\}$

B.  $\{0\}$

C. The set of all natural numbers less than 1

D. The set of all even prime numbers

**Answer: C**



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2. Which of the following is the null set ?

A.  $\{x/x \text{ is a real number and } x^2 - 1 = 0\}$

B.  $\{x/x \text{ is a real number and } x^2 + 1 = 0\}$

C.  $\{x/x \text{ is a real number and } x^2 - 9 = 0\}$

D.  $\{x/x \text{ is real number and } x^2 = 5x + 6\}$

**Answer: B**



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3. Empty set is

A. Unique

B. Unique if it exists

C. Not exist

D. Infinite

**Answer: A**



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4. If  $A = \{1, 2, 2, 1, 3, 4, 3, 4\}$ , then  $n(A) =$

A. 0

B. 4

C. 8

D. 20

**Answer: B**



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5. Which of the following is not a set

- A. The collection of all girls in a class
- B. The collection of all intelligent boys in a class
- C. The collection of all boys of age greater than 10 years
- D. The collection of all boys of height less than 100 cms

**Answer: B**

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**6. Which of the following is an infinite set**

- A. The set of all natural numbers less than 100
- B. The set of all natural numbers from 1 to 1 crore.
- C. The set of all natural multiples of 5
- D. The set of all divisors of 240

**Answer: C**

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7.  $A$  = Set of divisor of 3,  $B$  = set of divisor of 6,  $C$  = Set of divisors of 2 ,  
then

A.  $A \subseteq B$

B.  $B \subseteq A$

C.  $A \subseteq C$

D.  $C \subseteq A$

**Answer: A**



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8. If  $n(A) = 5$ , then  $n[P(A)] =$

A. 5

B. 0

C. 25

D. 32

**Answer: D**



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9. If  $A$  is any set such that  $n[P(A)] = 64$ , then  $n(A) =$

A. 32

B. 16

C. 8

D. 6

**Answer: D**



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10.

Let

$A = \{1, 2, 3\}$ ,  $B = \{2, 3, 4\}$ ,  $C = \{4, 5, 6, 7\}$  then  $(A \cup B) \cup C =$

A.  $\{2, 3\}$

B.  $\{1, 2, 3, 4, 5, 6, 7\}$

C.  $\{2, 4, 6\}$

D.  $\{1, 3, 5, 7\}$

**Answer: B**



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11.

If

$A = \{1, 2, 3, 4\}$ ,  $B = \{2, 4, 6, 8\}$ ,  $C = \{3, 4, 5, 8\}$ , then  $A \cap B \cap C =$

A.  $\emptyset$

B.  $\{4\}$

C.  $\mu$

D.  $\{2, 4\}$

**Answer: B**



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12. If  $A = \{\text{Rhombuses}\}$ ,  $B = \{\text{Rectangles}\}$ , then  $A \cap B =$

A.  $\{\text{Squares}\}$

B.  $\{\text{Rectangles}\}$

C.  $\{\text{Rhombuses}\}$

D.  $\{\text{Parallelograms}\}$

**Answer: A**



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13. If  $A = \{x : x \text{ is a factor of } 15\}$ ,  $B = \{x : x \text{ is a factor of } 18\}$ , then  $A \cap B =$



A.  $\{1, 3, 5, 15\}$

B.  $\{1, 2, 3, 6, 9, 18\}$

C.  $\{1, 3\}$

D.  $\{5, 15\}$

**Answer: C**



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14. If  $A = \{\text{Equilateral triangles}\}$ ,  $B = \{\text{Right angled triangles}\}$  and  $C = \{\text{Isosceles triangles}\}$ , then

A.  $A \cap B = \emptyset$

B.  $B \cap C = \emptyset$

C.  $A \cap C = \emptyset$

D. None

**Answer: A**

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15. If  $l, s$  are two straight lines and  $l \cap s = \emptyset$  then  $l$  and  $s$  are

- A. Coincide
- B. Parallel
- C. Perpendicular
- D. None

**Answer: B**

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16. If  $AB \cap CD = \emptyset, BC \cap AD = \emptyset$ , then ABCD is

- A. Quadrilateral
- B. Parallelogram
- C. Rhombus

D. Trepezium

**Answer: B**



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17. If  $AB \cap CD = \emptyset$ ,  $BC \cap AD = \emptyset$ , then ABCD is

A. Quadrilateral

B. Parallelogram

C. Rhombus

D. Trepezium

**Answer: D**



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18. If  $A = \{1, 2, 3, 4\}$ ,  $B = \{2, 4, 6, 8\}$  then  $A \Delta B =$

A. A

B. B

C. {1, 3}

D. {1, 3, 6, 8}

**Answer: D**



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19. If  $A = \{1, 2, 3\}$ ,  $B = \{2, 3, 4\}$ , then  $A - B =$

A. {2, 3}

B. {1, 2, 3, 4}

C. {1}

D. {4}

**Answer: C**



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20. If  $A = \{1, 2, 3, 4, 5\}$ ,  $B = \{0, 2, 4, 6, 8\}$  then  $A\Delta B =$

A.  $\{2, 4\}$

B.  $\{1, 3, 5\}$

C.  $\{0, 6, 8\}$

D.  $\{0, 1, 3, 5, 6, 8\}$

**Answer: D**



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21. Which of the following statements is true?

A.  $A \cup B = A \cup C \Rightarrow B = C$

B.  $A \cap B = A \cap C \Rightarrow B = C$

C.  $A\Delta B = A\Delta C \Rightarrow B = C$

$$D. A - B = A - C \Rightarrow B = C$$

**Answer: C**



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22. If  $A$  and  $B$  are disjoint nonempty sets then  $A - (A - B)$  is equal to

A.  $B$

B.  $A$

C.  $\emptyset$

D.  $A \cup B$

**Answer: C**



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23.  $(A - B) \cup (B - A) =$

A.  $(A \cap B) - (A \cup B)$

B.  $(A \cup B) - (A \cap B)$

C.  $A' \cup B'$

D.  $A' \cap B'$

**Answer: B**



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**24.**

**If**

$A = \{1, 2, 3, 4\}$ ,  $B = \{2, 4, 6, 8\}$ ,  $C = \{3, 4, 5, 8\}$ , then  $A - (B \cap C) =$

A.  $\emptyset$

B.  $\{1\}$

C.  $A$

D.  $\{1, 2, 3\}$

**Answer: D**

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25. If

$A = \{1, 2, 5, 6\}$ ,  $B = \{2, 4, 5\}$ ,  $C = \{2, 4, 6, 8\}$ , then  $A - (B \cup C) =$

- A.  $\emptyset$
- B. A
- C.  $\{1\}$
- D. None

**Answer: C**

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26. If

$A = \{3, 5, 7, 9\}$ ,  $B = \{1, 3, 5\}$ ,  $\mu = \{1, 2, 3, 4, 5, 7, 9\}$  then  $(A \cup B)' =$

- A.  $\{2, 4\}$



B.  $\{2, 4, 6, 8\}$

C.  $\{1, 2, 4, 7, 9\}$

D.  $\emptyset$

**Answer: A**



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27. If  $X$  and  $Y$  are two sets, then  $X \cap (Y \cup X)^c$  equals

A.  $X$

B.  $Y$

C.  $\emptyset$

D. none of these

**Answer: C**



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28. The set  $(A \cap B^c)^c \cup (B \cap C)$  is equal to

A.  $A^c \cup B \cup C$

B.  $A^c \cup B$

C.  $A^c \cup C^c$

D. none of these

**Answer: B**



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29. The set  $(A \cup B \cup C) \cap (A \cap B^c \cap C^c)^c \cap C^c$  is equal to

A.  $B \cap C^c$

B.  $A \cap C$

C.  $B \cap C^c$

D. none of these

**Answer: C**



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**30.** If  $n(A) = 20$ ,  $n(B) = 44$ ,  $n(A \cup B) = 51$ , then  $n(A \cap B) =$

A. 22

B. 39

C. 24

D. 13

**Answer: D**



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**31.** If  $n(A) = 25$ ,  $n(B) = 15$ ,  $n(A \cup B) = 30$ , then  $n(A \cap B) =$

A. 5

B. 10

C. 15

D. 25

**Answer: B**



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32. If  $n(A) = 20$ ,  $n(B) = 44$ ,  $n(A \cap B) = 13$  then  $n(A \cup B) =$

A. 22

B. 59

C. 24

D. 51

**Answer: D**



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33. If  $n(A) = 37$ ,  $n(B) = x$ ,  $n(A \cup B) = 52$ ,  $n(A \cap B) = 8$ , then  $x =$

A. 29

B. 44

C. 23

D. 15

**Answer: C**



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34. If  $A \subseteq B$ ,  $n(A) = 25$ ,  $n(B) = 35$ , then  $n(A \cap B) =$

A. 10

B. 25

C. 35

D. 60

**Answer: B**



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35. If  $A, B, C$  are three sets and  $S$  in the universal set such that  $n(S) = 900, n(A) = 400, n(B) = 250$  and  $n(A \cap B) = 150$ , then  $n(A' \cap B)$

A. 200

B. 600

C. 250

D. 400

**Answer: D**



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36.

If

$n(A) = 12, n(B) = 16, n(C) = 21, n(A \cap B) = 5, n(A \cap C) = 8, n(B \cap C) = 7$

A. 59

B. 31

C. 34

D. 27

**Answer: D**



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**37.**

If

$$n(A) = 10, n(B) = 15, n(C) = 20, n(A \cap B) = 4, n(A \cap C) = 7, n(B \cap C) = 6$$

A. 12

B. 18

C. 23

D. 27

**Answer: D**

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**38.** In a class 16 students read Mathematics , 17 read General Science and 6 both (of these ). The number of students in the class which read either Mathematics or general science is

- A. 6
- B. 10
- C. 11
- D. 27

**Answer: D**

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**39.** 90 students take Mathematics , 72 take Science in a class of 120 students. If 10 take neither Mathematics nor Science then the number of students take both the subjects is



A. 52

B. 110

C. 162

D. 100

**Answer: A**



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**40.** If  $A = \{ \text{Prime numbers} \}$ ,  $B = \{ \text{Even numbers} \}$ , then  $n(A \cap B) =$

A. 0

B. 1

C. 2

D.  $\emptyset$

**Answer: B**



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41. A survey shows that in a city that 63% of the citizens like tea where as 76% like coffee. If  $x\%$  like both tea and coffee, then

A.  $x = 63$

B.  $x = 39$

C.  $50 \leq x \leq 63$

D.  $39 \leq x \leq 63$

**Answer: B**



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42. An investigator interviewed 100 students to determine their preferences for the three drinks : milk (M) , coffee (C ) and tea (T) . He reported the following : 10 students had all the three drinks M, C, T , 20 had M and C only , 30 had C and T , 25 had M and T , 12 had M only , 5 had C only , 8 had T only . Find how many did not take any of the three drinks

A. 20

B. 3

C. 36

D. 42

**Answer: A**



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**43.** In a town of 10,000 families it was found that 40% families buy newspaper A , 20% families 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% buy all the three newspapers, the number of families which buy none of A, B , C is

A. 3000

B. 4000

C. 4500

D. 3500

**Answer: B**



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44. From 50 students taking examinations in mathematics, physics and chemistry , 37 passed mathematics, 24 physics and 43 chemistry . At most 19 passed mathematics and physics , at most 29 mathematics and chemistry and at most 20 physics and chemistry . The largest possible number that could have passed all three exams is

A. 10

B. 12

C. 9

D. 14

**Answer: D**



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45. Which of the following statements is true ?

A.  $P(A) \cap P(B) = P(A \cap B)$

B.  $P(A) \cup P(B) = P(A \cup B)$

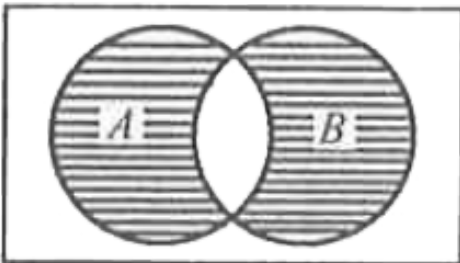
C.  $P(A - B) = P(A) - P(B)$

D. none of these

Answer: A

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46. The shaded area in the figure is



A.  $A \cap B$

B.  $A - B$

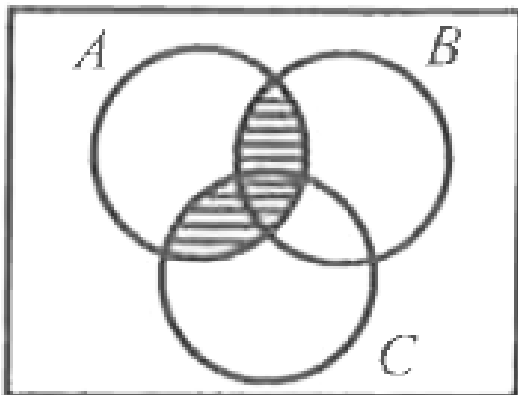
C.  $B - A$

D.  $A \Delta B$

Answer: D

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47. The shaded area in the figure is



A.  $A \cap (B \cup C)$

B.  $A \cap (B \cap C)$

C.  $A \cup (B \cap C)$

D.  $A \cup (B \cup C)$

**Answer: A**



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48.  $A = \{x : x \in R, x \geq 2\}$ ,  $B = \{x : x \in R, x < 4\}$  then  $A \cap B =$

A.  $\{x : x \in R, 2 < x < 4\}$

B.  $\{x : x \in R, 2 \leq x < 4\}$

C. A

D. B

**Answer: B**



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49.

$A = \{x : x \in R, |x| < 1\}$ ,  $B = \{x : x \in R, |x - 1| \geq 1\}$  and  $A \cup B = R$

A.  $\{x : 1 < x \leq 2\}$

B.  $\{x : 1 \leq x < 2\}$

C.  $\{x : 1 \leq x \leq 2\}$

D. none

**Answer: B**



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50.  $A = \{8^n - 7n - 1 : n \in N\}$ ,  $B = \{49(n - 1) : n \in N\}$  then

A.  $A \subseteq B$

B.  $B \subseteq A$

C.  $A = B$

D. none



**Answer: A**



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51. If  $X = \{4^n - 3n - 1 : n \in N\}$  and  $Y = \{9(n - 1) : n \in N\}$ , where  $N$  is the set of natural numbers, then  $X \cup Y$  is equal to

A.  $X$

B.  $Y$

C.  $N$

D.  $Y - X$

**Answer: B**



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52.  $A = \{(x, y) : y = 1/x, 0 \neq x \in R\}$ ,  $B = \{(x, y) : y = -x, x \in R\}$   
then

A.  $A \cap B = A$

B.  $A \cap B = B$

C.  $A \cap B = \emptyset$

D. none

**Answer: C**

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**53.**

$$A = \{x : \cos x > -1/2, 0 \leq x \leq \pi\}, B = \{x : \sin x > 1/2, \pi/3 \leq x \leq \pi\}$$

then

A.  $A \cap B = \left[ \frac{\pi}{3}, \frac{2\pi}{3} \right]$

B.  $A \cap B = \left[ -\frac{\pi}{3}, \frac{2\pi}{3} \right]$

C.  $A \cup B = \left[ -\frac{5\pi}{6}, \frac{5\pi}{6} \right]$

D. none

**Answer: A**



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54. If  $aN = \{ax : x \in N\}$  then  $3N \cap 7N =$

A.  $21N$

B.  $10N$

C.  $4N$

D. none

**Answer: A**



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55. If  $aN = \{ax : x \in N\}$  and  $bN \cap cN = dN$  where  $b, c \in N$  are relatively prime then

A.  $d = bc$

B.  $c = bd$

C.  $b = cd$

D. none

**Answer: A**



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**56.** Which of the following is an empty set

A. The set of prime numbers which are even

B. The solution set of  $\frac{2(2x + 3)}{x + 1} - \frac{2}{x + 1} + 3 = 0, x \in R$

C.  $(A \times B) \cap (B \times A)$  where A and B are disjoint

D. The set of reals which satisfy  $x^2 + ix + I - 1 = 0$

**Answer: C**



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57. The smallest  $A$  such that  $A \cup \{1, 2\} = \{1, 2, 3, 5, 9\}$  is

A.  $\{2, 3, 5\}$

B.  $\{3, 5, 9\}$

C.  $\{1, 2, 5, 9\}$

D. none

**Answer: B**



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58. In a college of 300 students, every student reads 5 newspapers and every newspaper is read by 60 students. The number of newspapers is

A. atleast 30

B. atmost 20

C. exactly 25

D. none

**Answer: C**



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59. Consider the set  $A$  of all determinants of order 3 with entries 0 or 1 only. Let  $B$  be the subset of  $A$  containing of all determinants with value 1. Let  $C$  be the subset of the set of all determinants with value -1. Then

A.  $C$  is empty

B.  $B$  has same number of elements as  $C$

C.  $A = B \cup C$

D.  $B$  has twice as many elements as  $C$

**Answer: B**



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60. Suppose  $A_1, A_2, \dots, A_{30}$  are 30 sets each with 5 elements and

$B_1, B_2, \dots, B_n$  are  $n$  sets each with 3 elements. Let  $\bigcup_{i=1}^{30} A_i = \bigcup_{j=1}^n B_j$

Assume that each element of  $S$  belongs to exactly ten  $A_i$ 's and to exactly nine of the  $B_j$ 's then  $n =$

A. 15

B. 135

C. 45

D. 90

**Answer: C**



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61. If  $A = \{\emptyset, \{\emptyset\}\}$  then the power set of  $A$  is

A.  $A$

B.  $\{\emptyset, \{\emptyset\}, A\}$

C.  $\{\emptyset, \{\emptyset\}, \{\{\emptyset\}\}, A\}$

D. none

**Answer: C**



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**62.** 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.

The values of  $m$  and  $n$  are

A. 7, 6

B. 6, 3

C. 5, 1

D. 8, 7

**Answer: B**



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63. If  $A$  and  $B$  have 3 and 6 elements then the minimum number of elements in  $A \cup B$  is

A. 3

B. 6

C. 9

D. 18

**Answer: B**



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64. 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 .

The number of students who have taken exactly one subject is

A. 6

B. 9

C. 7

D. all of these

**Answer: D**



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**65.** In a class of 100 students, 55 students have passed in Mathematics and 67 students have passed in Physics. Then the number of students who have passed in Physics only is

A. 22

B. 33

C. 10

D. 45

**Answer: D**



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66. Out of 800 boys in a school , 224 played cricket, 240 played hookey and 336 played basketball. Of the total , 64 played both basketball and hockey , 80 played cricket and basket ball and 40 played cricket and hockey 24 played all the three games. number of boys who did not play any game is

A. 128

B. 216

C. 240

D. 160

**Answer: D**



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67. The set of intelligent 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**



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68. In a certain town 25 % families own a phone and 15 % own a car, 65 % families 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 either a car or a phone . 3. 40,000 families live in the town .

Which of the above statements are correct ?

A. 1 and 2

B. 1 and 3

C. 2 and 4

D. 1, 2 and 3

**Answer: C**



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**69.** 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**



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70. In a battle 70% of the combatants lost one eye, 80% an ear, 75% an arm, 85% a leg.  $x\%$  lost all the four limbs. The minimum value of  $x$  is

A. 10

B. 12

C. 15

D. none of these

**Answer: A**



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