kd education academy (9582701166)

Time : 3 Hour | **STD 11 Science Maths** kd90+ ch-1 sets | **Total Marks : 100**

*** Choose the right answer from the given options. [1 Marks Each]** **[50]**

1. Choose the correct answers from the given four option:
   In a class of 60 students, 25 students play cricket and 20 students play tennis, and 10 students play both the games. Then, the number of students who play neither is.
   (A) 0 (B) 25 (C) 35 (D) 45

2. Let n(A) = 28,n(A ∩ B) =8, n(A∪B) =52, then n(A ∩ B′):
   (A) 30 (B) 32 (C) 20 (D) none of these

3. The solution set of 3x − 4 < 8 over the set of non-negative square numbers is:
   (A) {1, 2, 3} (B) {1,4} (C) {1} (D) {16}

4. In a class of 175 students the following data shows the number of students opting 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 (B) 48 (C) 60 (D) 22.

5. The set of all those elements of A and B which are common to both is called:
   (A) Union of two sets (B) Intersection of two sets
   (C) Disjoint sets (D) None of these

6. Choose the correct answers from the given four option:
   If X and Y are two sets and X′ denotes the complement of X, then $X \cap (X \cup Y)'$ is equal to.
   (A) X. (B) Y. (C) ϕ. (D) $X \cap Y$.

7. The number of subsets of a set containing n elements is:
   (A) n (B) $2^n - 1$ (C) n^2 (D) 2^n.

8. If A and B are two disjoint sets, then $n(A \cup B)$ is equal to:
   (A) $n(A) + n(B)$ (B) $n(A) + n(B) - n(A \cap B)$
   (C) $n(A) + n(B) + n(A \cap B)$ (D) $n(A)\, n(B)$.

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

10. IF R = {(2, 1), (4, 3), (4, 5)}, then range of the function is?

(A) Range R = {2, 4} (B) Range R = {1, 3, 5} (C) Range R = {2, 3, 4, 5} (D) Range R {1, 1, 4, 5}

11. If A = {2, 4, 6, 8, 10}, B = {1, 3, 5, 7, 9}, then A - B =_____:

(A) {} (B) {2, 4, 6, 8, 10}

(C) {1, 3, 5, 7, 9} (D) None

12. A market research group conducted a survey of 1000 consumers and reported that 720 consumers like product A and 420 consumers like product B.Then, the least number of consumers that must have liked both the products is:

(A) 140 (B) 180 (C) 210 (D) 190

13. Two finite sets have m and n elements. The number of elements in the power set of first set is 48 more than the total number of elements in power set of the second set. Then, the values of m and n are:

(A) 7, 6 (B) 6, 3 (C) 7, 4 (D) 3, 7.

14. In an examination 80% passed in English, 85% in Maths, 75% in both and 40 students failed in both subjects. Then the number of students appeared are:

(A) 300 (B) 400 (C) 500 (D) 600

15. In a certain group of 36 people, 18 are wearing hats and 24 are wearing sweaters. If six people are wearing neither a hat nor a sweater, then how many people are wearing both a hat and a sweater?

(A) 30 (B) 22 (C) 12 (D) 8

16. Choose the correct answers from the given four option:

A survey shows that 63% of the people watch a News Channel whereas 76% watch another channel. If x% of the people watch both channel, then

(A) x = 35 (B) x = 63 (C) $39 \leq x \leq 63$ (D) x = 39

17. There are 19 hockey players in a club. On a particular day 14 were wearing the prescribed hockey shirts, while 11 were wearing the prescribed hockey pants. None of then was without hockey pant or hockey shirt. How many of them were in complete hockey uniform?

(A) 8 (B) 6 (C) 9 (D) 7

18. The cardinality of the set P(P(P(f))) is.

(A) 0 (B) 1 (C) 2 (D) 4

19. The set $(A \cup B')' \cup B \cap C$ is equal to:

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

20. In a class of 50 students, 10 did not opt for math, 15 did not opt for science and 2 did not opt for either. How many students of the class opted for both math and science.

(A) 24 (B) 25 (C) 26 (D) 27

21. If A = (6, 7, 8, 9), B = (4, 6, 8, 10) and C = {x : x ∈ N : 2 < x ≤ 7} ; find :B − C

(A) {4, 6} (B) {4, 6, 8} (C) {6, 8, 10} (D) {8, 10}

22. If A and B are two sets such that $n(A) = 70, n(B) = 60, n(A \cup B) = 110,$ then $n(A \cap B)$ is equal to:

(A) 240 (B) 50 (C) 40 (D) 20.

23. In a class of 120 students numbered 1 to 120, all even numbered students opt for Physics, whose numbers are divisible by 5 opt for Chemistry and those whose numbers are divisible by 7 opt for Math. How many opt for none of the three subjects?

(A) 19 (B) 41 (C) 21 (D) 57

24. Choose the correct answers from the given four option:
Let S = {x | x is a positive multiple of 3 less than 100} P = {x | x is a prime number less than 20}. Then n(S) + n(P) is.

(A) 34 (B) 31 (C) 33 (D) 30

25. Out of 500 first year students, 260 passed in the first semester and 210 passed in the second semester.If 170 did not pass in either semester, how many passed in both semesters?

(A) 30 (B) 40 (C) 70 (D) 140

26. If A, B and C are any three sets, then $A - (B \cup C)$ is equal to.

(A) $(A - B) \cup (A - C)$ (B) $(A - B) \cup C$

(C) $(A - B) \cap C$ (D) $(A - B) \cap (A - C)$

27. In a group of 15,7 have studied German, 8 have studied French, and 3 have not studied either. How many of these have studied both German and French?

(A) 0 (B) 3 (C) 4 (D) 5

28. Two finite sets have N and M elements. The number of elements in the power set of first set is 48 more than the total number of elements in power set of the second test. Then the value of M and N are.

(A) 7, 6 (B) 6, 4 (C) 7, 4 (D) 6, 3

29. In a science talent examination, 50% of the candidates fail in Mathematics and 50% fail in Physics. If 20% fail in both these subjects, then the percentage who pass in both Mathematics and Physics is:

(A) 0% (B) 20% (C) 25% (D) 50%

30. Choose the correct answers from the given four option:
If X = {8n - 7n - 1 | n ∈ N} and Y = {49n - 49 | n ∈ N}. Then
(A) $X \subset Y$ (B) $Y \subset X$ (C) $X = Y$ (D) $X \cap Y = \phi$

31. If A = {1, 2, 3, 4, 5}, then the number of proper subsets of A is:
(A) 31 (B) 38 (C) 48 (D) 54

32. All the students of a batch opted Psychology, Business, or both. 73% of the students opted Psychology and 62% opted Business. If there are 220 students, how many of them opted for both Psychology and business?
(A) 60 (B) 100 (C) 77 (D) 35

33. Find the equivalent set for A − B.
(A) $A \cup (A \cap B)$ (B) $A - B$ (C) $A - (A \cap B)$ (D) $A \cap B$

34. In a community of 175 persons, 40 read the Times, 50 read the Samachar and 100 do not read any. How many persons read both the papers?
(A) 10 (B) 15 (C) 20 (D) 25

35. In an examination, 34% of the candidates fail in Arithmetic and 42% in English.If 20% fail in Arithmetic and English, the percentage of those passing in both subjects is:
(A) 44 (B) 45 (C) 46 (D) 47

36. In set-builder method the null set is represented by:
(A) {} (B) ϕ (C) $\{x : x \neq x\}$ (D) $\{x : x = x\}$.

37. If out of 150 students who read at least one newspaper The Times of India, The Hindustan Times and The Hindu. There are 65 who read The Times of India, 41 who read The Hindu and 50 who read The Hindustan Times.What is the maximum possible number of students who read all the three newspaper?
(A) 7 (B) 42 (C) 3 (D) Cannot be determined

38. If n(A) denotes the number of elements in set A and if n(A) = 4,n(B) = 5 and n(A ∩ B) = 3 then n[(A × B) ∩ (B × A)]=
(A) 8 (B) 9 (C) 10 (D) 11

39. Given A = {a, b, c, d, e, f, g, h} and B = {a, e, i, o, u} then B - A is equal to:
(A) {i, o, u} (B) {a, b, c} (C) {c, d, e} (D) {a, i, z}

40. A and B are two sets having 3 and 5 elements respectively and having 2 elements in common. Then the number of elements in A × B is:
(A) 6 (B) 36 (C) 15 (D) None of these

41. If A = {x : x is a multiple of 3} and B = {x : x is a multiple of 5}, then A - B is:
(A) $A \cap B$ (B) $A \cap \overline{B}$ (C) $\overline{A} \cap \overline{B}$ (D) $\overline{A \cap B}$.

42. If A = {1, 2, 3, 4, 5}, then the number of proper subsets of A is:

(A) 120 (B) 30 (C) 31 (D) 32.

43. An investigator interviewed 100 students to determine the performance of three drinks: milk, coffee and tea. The investigator reported that 10 students take all three drinks milk, coffee and tea; 20 students take milk and coffee; 25 students take milk and tea; 12 students take milk only; 5 students take coffee only and 8 students take tea only. Then the number of students who did not take any of three drinks is:

(A) 10 (B) 20 (C) 25 (D) 30.

44. Let U be the universal set containing 700 elements. If A, B are subsets of U such that $n(A) = 200$, $n(B) = 300$ and $n(A \cap B) = 100$. Then, $n(A' \cap B') =$

(A) 400 (B) 600 (C) 300 (D) None of these.

45. Let A = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}. Then the number of subsets of A containing exactly two elements is:

(A) 20 (B) 40 (C) 45 (D) 90

46. If A and B are two sets such that n(A) = 17, n(B) = 23, n(A ∪ B) = 38, find n(A ∩ B):

(A) 1 (B) 2 (C) 3 (D) 4

47. Let A and B be two sets such that n(A) = 16, n(B) = 12, and n(A ∩ B) = 8.Then n(A∪B) equals:

(A) 28 (B) 20 (C) 36 (D) 12

48. The set $(A \cup B')' \cup B \cap C$ is equal to:

a. $A' \cup B \cup C$
b. $A' \cup B$
c. $A' \cup C'$
d. $A' \cap B$.

49. Let A and B be two sets that $n(A) = 16$, $n(B) = 14$, $n(A \cup B) = 25$. Then, $n(A \cap B)$ is equal to:

a. 30
b. 50
c. 5
d. None of these.

50. If A = {1, 3, 5, 7, 9, 11, 13, 15, 17} B = {2, 4, ..., 18} and N the set of natural numbers is the universal set, then $A' \cup (A \cup B) \cup B')$ is

a. ϕ
b. N
c. A

d. B

*** Answer the following questions in one sentence. [1 Marks Each]** **[9]**

51. Describe the following sets in Roster form:
    $\{x \in N : x^2 < 25\}$;
52. If $X = \{8^n - 7x - 1 : n \in N\}$ and $Y = \{49(n-1) : n \in N\}$, then prove thet $X \subseteq Y$.
53. The given following sets are finite & in which of it infinite in if?
    $\{x \in N : x > 5\}$
54. If A = {1, 2, 3, 4, 5}, B = {4, 5, 6, 7, 8}, C = {7, 8, 9, 10, 11}, and D = {10, 11, 12, 13, 14}. Find:
    $A \cup C$
55. The given set is the example of an empty set or not?
    Set of all even prime numbers.
56. If A = {1, 2, 3, 4, 5}, B = {4, 5, 6, 7, 8}, C = {7, 8, 9, 10, 11}, and D = {10, 11, 12, 13, 14}. Find:
    $A \cup B$
57. List all the elements of the following sets:
    $B = \left\{x : x = \frac{1}{2n-1}, 1 \leq n \leq 5\right\}$;
58. Are the following sets equal?
    A = {x : x is a letter in the word paper}, B = {x : x is a letter in the word paper}, C = {x : x is a letter in the word paper}.
59. The given following sets are finite & in which of it infinite in it?
    Set of concentric circles in a plane.

*** Given section consists of questions of 2 marks each.** **[12]**

60. In a survey of 600 students in a school, 150 students were found to be taking tea and 225 taking coffee, 100 were taking both tea and coffee. Find how many students were taking neither tea nor coffee.
61. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both H and T, 8 read both T and I, 3 read all three newspapers.
    Find the number of people who read at least one of the newspaper.
62. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both H and T, 8 read both T and I, 3 read all three newspapers.
    Find the number of people who read exactly one newspaper.
63. Given L = {1, 2, 3, 4}, M = {3, 4, 5, 6} and N = {1, 3, 5}
    Verify that $L - (M \cup N) = (L - M) \cap (L - N)$

64. Write the following sets in the roaster form:

$E = \left\{w | \frac{w-2}{w+2} = 3, w \in R\right\}$

65. A, B and C are subsets of Universal Set U. If A = {2, 4, 6, 8, 12, 20} B = {3, 6, 9, 12, 15}, C = {5, 10, 15, 20} and U is the set of all whole numbers, draw a Venn diagram showing the relation of U, A, B and C.

*** Given section consists of questions of 3 marks each.** **[9]**

66. In a survey it was found that 21 people liked product A, 26 liked product B and 29 liked product C. If 14 people liked products A and B, 12 people liked products C and A, 14 people liked products B and C and 8 liked all the three products. Find how many liked product C only?

67. A college awarded 38 medals in Football, 15 in Basketball and 20 in Cricket. If these medals went to a total of 58 men and only three men got medals in all three sports, then how many received medals in exactly two of the three sports.

68. Let $T = \left\{x | \frac{x+5}{x-7} - 5 = \frac{4x-40}{13-x}\right\}$. Is T an empty set? Justify your answer.

*** Given section consists of questions of 5 marks each.** **[20]**

69. Out of 100 students; 15 passed in English, 12 passed in Mathematics, 8 in Science, 6 in English and Mathematics, 7 in Mathematics and Science; 4 in English and Science; 4 in all the three. Find how many passed.
    i. In English and Mathematics but not in Science.
    ii. In Mathematics and Science but not in English.
    iii. In Mathematics only.
    iv. In more than one subject only.

70. In a town of 10,000 families it was found that 40% families buy newspaper A, 20% families buy newspaper B, 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. Find
    i. The number of families which buy newspaper A only.
    ii. The number of families which buy none of A, B and C.

71. Match the following sets for all sets A, B and C.

(i)	$((A' \cup B') - A)'$	(a)	$A - B$
(ii)	$[B' \cup (B' - A)]'$	(b)	A
(iii)	$(A - B) - (B - C)$	(c)	B
(iv)	$(A - B) \cap (C - B)$	(d)	$(A \times B) \cap (A \times C)$
(v)	$A \times (B \cap C)$	(e)	$(A \times B) \cup (A \times C)$
(vi)	$A \times (B \cup C)$	(f)	$(A \cap C) - B$

72. In a group of 50 students, the number of students studying French, English, Sanskrit were found to be as follows:
French = 17, English = 13, Sanskrit = 15
French and English = 09, English and Sanskrit = 4
French and Sanskrit = 5, English, French and Sanskrit = 3. Find the number of students who study.

i. French only.
ii. English only.
iii. Sanskrit only.
iv. English and Sanskrit.
v. French and Sanskrit but not English.
vi. French and English but not Sanskrit.
vii. At least one of the three languages but not French.
viii. None of the three languages.

----- the journey of thousands miles begins with a single step -----