INDIAN SCHOOL AL WADI AL KABIR

DEPARTMENT OF MATHEMATICS 2024 – 2025

Work Sheet 2 –- Class XI

SETS - MCQ & Descriptive Questions

1	If A and B are two sets, $A \cap (A \cap B)$ is (*a*) A (*b*) B (*c*) ϕ (*d*) $A \cap B$
2	If A = {*a*, *b*, *c*, *d*, *e*}, the number of elements of the power set of A is (*a*) 1 (*b*) 5 (*c*) 2^5 (*d*) 5^2
3	If $n(U) = 1000$, $n(A) = 400$, $n(B) = 300$ and $n(A \cap B) = 100$, $n(A' \cap B')$ is equal to (*a*) 400 (*b*) 600 (*c*) 100 (*d*) 300
4	Let $U = \{x : x \in N, x \leq 10\}$, $A = \{x : x \in N, 2 \leq x \leq 8\}$ and B = {*x* : x is a prime number < 10}, then $(A - B)'$ is equal to (*a*) {3, 4, 5, 6, 7} (*b*) {4, 6, 8} (*c*) {2, 3, 5, 7} (*d*) {1, 2, 3, 5, 7, 9 10}
5	Let A and B are two finite disjoint sets such that $n(A \cup B) = 475$ and $n(A) = 435$, find $n(B)$
6	Write the set {*x* : *x* is prime and $10 < x < 30$} in roster form.
7	For the sets U = {1, 2, 3, ..., 10}, A = {1, 2, 5, 6}, B = {6, 7}, verify that $A - B = A \cap B' = B' - A'$
8	For any three sets A, B, C, prove that $A - (B \cap C) = (A - B) \cup (A - C)$ If A = {*a*, *b*, *c*}, write the power set of A
9	If A = {4, 5, 7, 8, 10}, B = {4, 5, 9} and C = {1, 4, 6, 9}, verify that (*i*) $(A \cap B) \cap C = A \cap (B \cap C)$
10	If A = {4, 5, 8, 12}, B = {1, 4, 6, 9} and C = {1, 2, 4, 7, 8}, then find (*i*) $A - (B - A)$ (*ii*) $A - (B \cap C)$
11	Two finite sets have *m* and *n* elements. The total number of subsets of the first set is 240 more than the subsets of second set. Find the values of *m*, *n*.
12	Which of the following collections are sets? Justify your answer. (*i*) Collection of students of your school. (*ii*) Collection of the best Cricket men of the world.

13	In a group of 20 students, 12 take tea, 16 take coffee and 3 take neither of the two. How many take both tea and coffee?
14	Which of the following sets are empty sets? (*i*) $\{x : x \in R, x^2 + 3 = 0\}$ (*ii*) $\{x : x$ is an even prime number$\}$
15	Write the following subsets of R as intervals: (*i*) $\{x : x \in R, -4 < x \leq 6\}$ (*ii*) $\{x : x \in R, 12 < x < -10\}$ (*iii*) $\{x : x \in R, 0 \leq x < 7\}$ (*iv*) $\{x : x \in R, 3 \leq x \leq 4\}$
16	Let U = {1, 2, 3, 4, 5, 6, 7, 8, 9}, A = {2, 4, 6, 8} and B = {2, 3, 5, 7}, then verify that (*i*) $(A \cup B)' = A' \cap B'$ (*ii*) $(A \cap B)' = A' \cup B'$
17	For any two sets A and B, prove that $A \cup B = A \cap B$ if and only if A = B.
18	If $a \in N$ such that $aN = \{ax : x \in N\}$, find $3N \cap 7N$.
19	In a group of 50 people, 35 speak Hindi, 25 speak both Hindi and English and all speak at least one of the two languages . How many people speak only English but not Hindi? How many people speak English?
20	If A, B, C are three sets and U is the universal set such that $n(U) = 700$, $n(A) = 200$, $n(B) = 300$ and $n(A \cap B) = 100$. Find $n(A' \cap B')$.
21	If X and Y are two sets such that $n(X) = 17$, $n(Y) = 23$, $n(X \cup Y) = 38$, find $n(X \cap Y)$.
22	A and B have 3 and 6 elements, respectively. What is the maximum number of elements of $A \cup B$?
23	In a committee, 50 people speak French, 20 speak Spainsh and 10 speak both Spainsh and French. How many speak at least one of these two languages?
24	In a survey of 600 students in a school, 150 students were found to be taking tea, 225 taking coffee, 100 were taking both tea and coffee. Find how many students were taking neither tea nor coffee.
25	Two finite sets A and B 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. Find the values of m and n.

Answers

1) A
2) C
2) C
4) A
5) 40
6) {11, 13, 17, 19, 23, 29}
9) P(A) = {{a, b, c}, {a, b}, {a, c}, {b, c}, {a}, {b}, {c}, ϕ}
10) (i) {4, 5, 8, 12} (ii) {5, 8, 12}
11) $m = 8, n = 4$
12) (i) is a set (ii) not a set because the elements are not well defined.
13) 11
14) (i) an empty set (ii) not an empty set.
15) (i) $(-4, 6]$ (ii) $(-12, -10)$ (iii) $[0, 7)$ (iv) $[3, 4]$
18) 21N
19) 15, 40
20) 300
21) $n(X \cap Y) = 17 + 23 - 38 = 40 - 38 = 2.$
22) 9
23) 60
24) 325
25) M = 6 & n = 3