

**Important Questions 2010**  
**Class-XII- Maths**  
**Sets**

**Q. 1.** Write the proper subsets of set  $A = \{ \emptyset, a \}$

**Q. 2.** Describe the set  $B = \left\{ \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \dots \right\}$

**Q. 3.** Set  $A = \{1, 2, 4, 5\}$ ,  $B = \{2, 3, 5, 6\}$  and  $C = \{4, 5, 6, 7\}$  find  $A - (B \cap C)$

**Q. 4.** Find the union of the following pair of sets

$$A = \{x : x \in \mathbb{Z}^+ \text{ and } x^2 > 7\}; B = \{1, 2, 3\}$$

**Q. 5.** Find the union and intersection of each of the following pairs of sets.

(i)  $A = \{x : x \in \mathbb{Z}^+\}$ ;  $B = \{x : x \in \mathbb{Z}^+ \text{ and } x < 0\}$

(ii)  $A = \{x : x \in \mathbb{N} \text{ and } 1 < x < 4\}$ ;  $B = \{x : x \in \mathbb{N} \text{ and } 4 < x < 9\}$

**Q. 6.** Write following intervals in set-builder form :

(1)  $(-7, 0)$  (2)  $[6, 12]$  (3)  $(6, 12)$  (4)  $[-20, 3]$ .

**Q. 7.** Let  $V = \{a, e, i, o, u\}$  and  $B = \{a, i, k, u\}$ . Find  $V - B$  and  $B - V$ .

**Q. 8.** Let  $A = \{\text{all real numbers set is fging } x^2 - 8x + 12 = 0\}$

$B = \{2, 4, 6\}$ ,  $C = \{2, 4, 6, 8, \dots\}$ ,  $U = \{1, 2, 3, 4, \dots\}$

(i) Decide ; which are the subsets of which?

(ii) Identity the pair of disjoint sets

(iii) Find:  $(B \cap C)^1$  (iv) Find:  $(A - B)^1$

**Q. 9.** If  $A = \{3, 5, 7, 9, 11\}$ ,  $B = \{7, 9, 11, 13\}$ ,  $C = \{11, 13, 15\}$   $D = \{15, 17\}$ . Find  $(A \cap B) \cap (B \cup C)$ .

**Q. 10.** If  $A = \{5, 7, 9, 10, 11, 12\}$ ,  $B = \{9, 10, 13, 14, 16\}$ , then Verify :

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

**Q. 11.** If  $U = \{x : x \in \mathbb{N} \text{ and } z \leq x \leq 12\}$ ,  $A = \{x : x \text{ is even prime no}\}$  and  $B = \{x : x \text{ is a factor of } 24\}$  then Verify:  $A' - B' = B - A$

**Q. 12.** Let A and B be two sets such that  $n(A) = 20$ ,  $n(A \cap B) = 42$  and  $n(A \cup B) = 4$ . Find

1)  $n(B)$  2)  $n(A - B)$  3)  $n(B - A)$ .

**Q.13.** A and B are two sets such that  $n(A) = 3$ ,  $n(B) = 6$ . Find the max and min values of  $n(A \cap B)$ .

**Q.14.** If  $n(U) = 25$ ,  $n(A) = 15$ ,  $n(A \cup B) = 6$  and  $n(A \cap B) = 8$ , then  $n(B - A)$ .

**Q.15.** If  $U = \{2, 3, 5, 7, 9\}$  is universal set &  $A = \{3, 2\}$  and  $B = \{2, 5, 7, 9\}$  then prove that:

(1)  $(A \cap B) = A' \cap B'$  (2)  $(A \cup B)' = A' \cap B'$ .

**Q. 16.** Let  $U = \{1, 2, 3, 4, 5, 6\}$ ,  $A = \{2, 3\}$  and  $B = \{3, 4, 5\}$ .

Find  $A'$ ,  $B'$ ,  $A' \cup B'$ ,  $A' \cap B'$  and hence show that  $(A \cap B)' = A' \cup B'$

**Q. 17.** If  $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ ,  $A = \{2, 4, 6, 8\}$ ,  $B = \{2, 3, 5, 7\}$ , Verify De-Morgan's law:  $(A \cap B)' = A' \cup B'$ .

**Q.18.** If  $A = \{2, 6, 8\}$ ,  $B = \{1, 3, 7, 8\}$ ,  $C = \{3, 6, 8, 9\}$ ,  $U = \{1, 2, 3, 6, 7, 8, 9\}$  then Verify both the De Morgan's laws.

**Q.19.** Let A, B and C be three sets. If  $A \subseteq B$  and  $B \subseteq C$ , is it true that  $A \subseteq C$ , If not, give an example.

**Q.20.** List all subsets of  $\{-1, 0, 1\}$

**Q.21.** Write down the subsets of  $\{2, \{3\}\}$ . Also find the power set.

**Q.22.** Let  $A = \{e, f, g\}$ , Write the subsets and power set of set A.

**Q.23.** Show that:  $n\{P[P(P(f))]\} = 4$ .

**Q.24.** Prove :  $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ , Where A, B are finite sets.

**Q.25.** Let U be the set of all triangles in a plane. If A is the set of all triangles with at least one angle different from  $60^\circ$ , what is  $A'$ .

**Q. 26.** If X and Y are two sets such that  $X \cup Y$  has 18 elements, X has 8 elements and Y has 15 elements, How many elements  $X \cap Y$  have.

**Q.27.** Out of 500 car owners investigated, 400 owned car A and 200 owned car B, 50 owned both A and B cars. Is this data correct.

**Q.28.** Draw the Venn-Diagrams for

(i)  $A - B$  (ii)  $A' \cap B'$  (iii)  $A' \cup B'$  (iv)  $(B - A)'$   
(v)  $(A \cap B)'$  and  $A' \cup B'$

**Q.29.** A and B are two sets of 36 elements such that  $n(A - B) = 20 + x$ ,  $n(B - A) = 3x$  and  $n(A \cap B) = x + 1$ . Draw a Venn diagram to illustrate this information. Find (i) the value of x, (ii)  $n(A \cup B)$ .

**Q.30.** 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 taking tea nor coffee.

**Q.31.** A survey of 500 television viewers, produced the following information; 285 watch football, 195 watch hockey, 115 watch basketball, 45 watch football and basketball, 70 watch football and hockey, 50 watch hockey and basketball, 50 do not watch any three games. How many watch all the three games? How many watch exactly one of the three games?

**Q.32.** 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.

**Q.33.** In a survey of 700 students in a college, 180 were listed as drinking Limca, 275 as drinking Mirinda and 95 were listed as both drinking Limca as well as Mirinda. Find how many students were drinking neither Limca nor Mirinda.

**Q.34.** Out of a group of 50 persons, 32 take eggs, 25 take meat and 15 take both eggs and meat. How many of them are pure vegetarians.

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**Q.35** .In an exam, 80 students secured first class marks in English or Maths. Out of these 50 students obtained first class marks in Maths and 10 students in English and Maths both. How many students secured first class marks in English only.

**Q.36**. In a survey of 25 students, it was formed that 15 had taken mathematics, 12 had taken physics and 11 had taken chemistry, 5 had taken maths and chemistry, 9 had and 3 had taken all three subjects. Find the number of students that had taken.

Only Maths (ii) Physics and Chemistry but not Maths

(iii) Maths and Physics but not Chemistry

(iv) Only one of the subjects (v) Atleast one of three subjects

(v) None of three subjects.

**Q.37**. A college awarded 38 medals in Football, 15 in Basketball and 20 in cricket. If these medals went to 58 men and only 3 men got medals in all the three sports, how many received medals in exactly two of the 3 sports?

**Q.38**. 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:

(i) the number of people who read at least one of the newspapers.

(ii) the number of people who read exactly one newspaper.