

Followings are of 2 Marks each (Q01-05).

Q01. If  $A = \{3, 4, 5, 7, 9\}$  and  $B = \{3, 5, 9, 10\}$ , then find  $A - (B \cap A)$  and  $(A - B) \cup (B - A)$ .

**OR**

Let  $A_1 = \{1, 2, 3, 4\}$ ,  $A_2 = \{3, 4, 5, 6\}$ ,  $A_3 = \{3, 4, 5, 6, 7, 8\}$ .

Then find  $\bigcup_{k=1}^3 A_k$  and  $\bigcap_{k=1}^3 A_k$ .

Q02. (i) Write  $(-7, 9]$  in the set-builder form. (ii) Write  $\{x : \sqrt{2} \leq x \leq 2\}$  as an interval.

Q03. Let  $U = \{0, 1, 2, 3, \dots, 9\}$ ,  $A = \{1, 2, 5, 6\}$  and  $B = \{2, 3, 4, 9\}$ . Then write  $\overline{(A - B)}$ .

Q04. Write down all the possible subsets of  $A = \{1, \{2, 3\}, \{\phi\}\}$ . How many proper subsets does it have?

Q05. Define a singleton set. Give an example in set builder form. [2×5 = 10]

Followings are of 3 Marks each (Q06-07).

Q06. Check which of the following pair of sets are disjoint? Give reason (s).

(a)  $\{a, e, i, o, u\}$  and  $\{c, d, p, s\}$

(b)  $\{x : x \text{ is a positive prime no.}\}$  and  $\{x : x \text{ is an even integer}\}$

(c)  $\{x : x \text{ is a letter in English alphabet}\}$  and  $\{x : x \text{ is a letter in ISHA}\}$ .

Q07. Let  $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$ ,  $A = \{2, 3, 7, 8\}$  and  $B = \{2, 4, 5\}$ .

Verify that (i)  $(A \cap B)' = A' \cup B'$  (ii)  $(A \cup B)' = A' \cap B'$ .

**OR**

A and B are two 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 the value of (i)  $n(A \cup B)$  (ii)  $n(A' \cap B')$ . [3×2 = 6]

Following is of 4 Marks (Q08).

Q08. **CASE STUDY :** There are 200 individuals with a skin disorder, 120 had been exposed to the chemical  $C_1$ , 50 to chemical  $C_2$  and 30 to both the chemical  $C_1$  and  $C_2$ .



Based on the information given above, find the number of individuals exposed to

(a) chemical  $C_1$  but not chemical  $C_2$

(b) chemical  $C_2$  but not chemical  $C_1$

(c) chemical  $C_1$  or chemical  $C_2$

(d) none of the chemicals.

[1×4 = 4]

Followings are of 5 Marks each (Q09-10).

Q09. Using properties of sets, show that  $A \cap \overline{B} = A - B$ .

**OR**

In a beauty contest, half the number of judges voted for Miss Anamika, two-third of them voted for Miss Bhawna, 10 voted for both and 6 did not vote for either Anamika or Bhawna. Find how many judges in all, were present there?

Q10. Let  $W = \{1, 2, 3, 4\}$ ,  $X = \{3, 4, 5, 6\}$ ,  $Y = \{5, 6, 7, 8\}$  and  $Z = \{7, 8, 9, 10\}$ . Then find the followings.

- (i)  $W \cup X$                       (ii)  $W \cup Y$                       (iii)  $X \cap Y$   
(iv)  $W \cup X \cup Y$                       (v)  $W \cap X \cap Z$

[5×2=10]

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