THINK ACADEMY
MATH CLASSES By O.P. GUPTA
Class XI - Mathematics (041)
Topics - Sets Theory

VISHWAS TEST SERIES - 1
(For Academic session 2024-25)

For Video Solutions **CLICK HERE**

Max. Marks - 30
Time - 60 Minutes

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

Q01. If $A=\{3,4,5,7,9,10,11\}$ and $B=\{3,5,7,10\}$, then find **(i)** $A-(B\cap A)$ and **(ii)** $(A-B)\cup(B-A)$.

OR

Let $A_1=\{1,2,3,4\}$, $A_2=\{3,4,5,6\}$, $A_3=\{3,4,5,6,7,8\}$ and $A_4=\{2,3,4,7,9\}$.

Then find $\bigcup_{k=2}^{4}A_k$ and $\bigcap_{k=1}^{4}A_k$.

Q02. **(i)** Write $\left(-\frac{1}{\sqrt{3}},4\right]$ in the set-builder form. **(ii)** Write $\{x:-2\le x\le\pi\}$ as an interval.

Q03. Let $U=\{0,1,2,3,...,9\}$, $A=\{1,2,5,6,7\}$ and $B=\{0,2,3,4,9\}$. Then write $\overline{(A-B)}$.

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

Q05. Define a singleton set. Give an example in set builder form. $[2\times5=10$

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

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

(a) $\{a,e,f,p,v\}$ and $\{c,d,r,x\}$

(b) $\{x:x$ is a positive integer$\}$ and $\{y:y$ is an even integer$\}$

(c) $\{x:x$ is a letter in SHIKSHA$\}$ and $\{x:x$ is a letter in USHA$\}$.

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

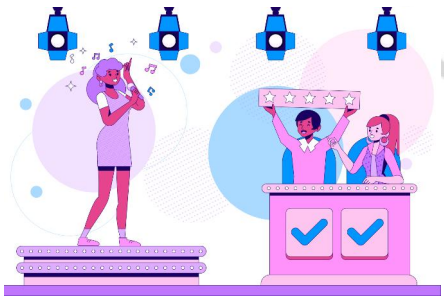
Verify that **(i)** $(A\cap B)'=A'\cup B'$ **(ii)** $(A\cup B)'=A'\cap B'$.

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)** $n(A'\cap B')$. $[3\times2=6$

Following is of 4 Marks (Q08).

Q08. **CASE STUDY :** 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.



Based on the information provided, answer the questions given below.

(a) How many judges in all, were present there?

(b) How many judges voted for Miss Anamika?

(c) How many judges voted for Miss Bhawna?

(d) How many judges voted for only Miss Anamika?

$[1\times4=4$

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

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

OR

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. 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.

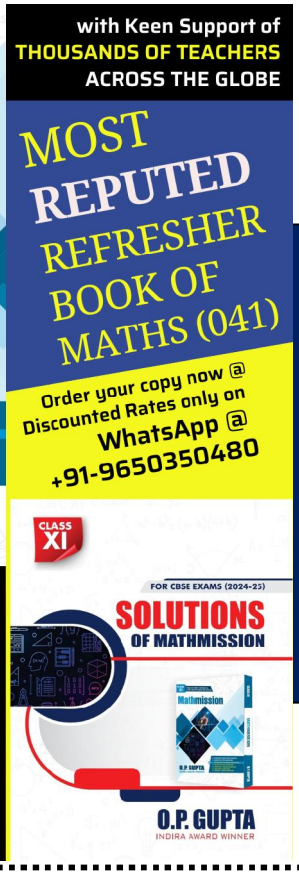
Q10. Let $U = \{0,1,2,3, ..., 10\}$ be the universal set.

Also let $W = \{1,2,3,4,5\}$, $X = \{3,4,5,6,7\}$, $Y = \{5,6,7,8,9\}$ and $Z = \{7,8,9,10\}$

Then find the followings.

(i) $W \cup X$ **(ii)** $W \cup \overline{Y}$ **(iii)** $\overline{X} \cap Y$

(iv) $W \cup X \cup Y$ **(v)** $W \cap X \cap Z$. $[5 \times 2 = 10$



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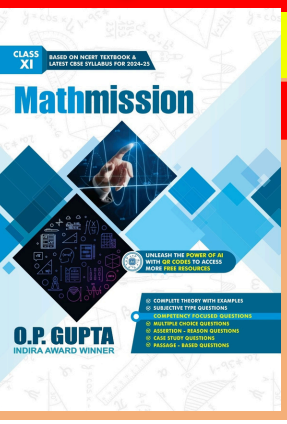

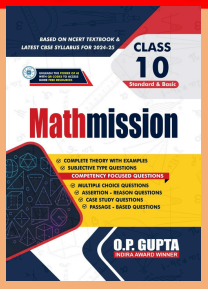

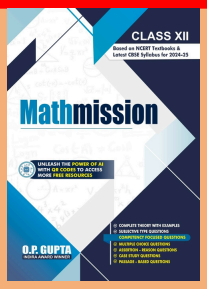

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