HOW TO TEACH

MATH MCQs

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For Class XI

Graph of sinx

a b c d
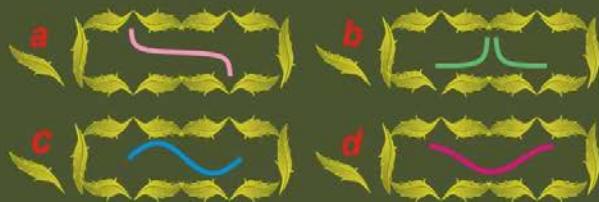
BOOK - 1

Chapter 1

SETS

(1)   Set of natural numbers:
$$\mathbb{N} = \{1, 2, 3, 4, \dots\}$$

(2)   Set of even natural numbers:
$$\mathbb{E} = \{2, 4, 6, \dots\}$$

(3)   Set of odd natural numbers:
$$\mathbb{O} = \{1, 3, 5, \dots\}$$

(4)   Set of prime numbers:
$$\mathbb{P} = \{2, 3, 5, 7, 11 \dots\}$$

(5)   Set of whole numbers:
$$\mathbb{W} = \{0, 1, 2, 3, 4, \dots\}$$

(6)   Set of integers:
$$\mathbb{Z} = \{0, \pm 1, \pm 2, \pm 3, \dots \pm \infty\}$$

or

$$\mathbb{Z} = \{-\infty, \cdots, -3, -2, -1, 0, 1, 2, 3, \cdots, +\infty\}$$

(7)   Set of non-negative integers:
$$= \{0, 1, 2, 3, 4, \dots\}$$

(8)   Set of rational numbers:
$$\mathbb{Q} = \{x : x = \frac{p}{q},\ p \in \mathbb{Z},\ q \in \mathbb{Z}, q \neq 0\}$$

(9)   Set of irrational numbers:
$$\mathbb{Q}' = \{x : x \neq \frac{p}{q},\ p \in \mathbb{Z},\ q \in \mathbb{Z}, q \neq 0\}$$

(10)   Set of real numbers:
$$\mathbb{R} = \{x : x \in \mathbb{Q} \cap \mathbb{Q}'\}$$

(10)   Set of complex numbers:
$$\mathbb{C} = \{a + ib :\ \forall\, a, b \in \mathbb{R}\}$$

ELEMENTS OF A SET

MCQ-1:

If $A = \{3,5,7\}$, then which is true?

    (a) $\{3\} \supset A$ (b) $\{3\} \in A$ (c) $\{3\} \in \{3,5\}$ (d) $\{3\} \subset A$

Solution:

> **Note:** 3 is an element of set A but $\{3\}$ is a set, which is subset of A.

The answer is (d).

MCQ-2:

If $A = \{ \{3\}, \{5\}, \{5,7\} \}$, then which of the following is true?

    (a) $\{5\} \in A$ (b) $\{5\} \subset A$ (c) $\{5\} \supset A$ (d) $5 \in A$

Solution:

> **Note:** $\{5\}$ is an element of set A, not subset of A, so that $\{5\} \in A$.

The answer is (a).

POWER SET

MCQ-3:

If $A = \{6\}$, then what is the power set of A?

    (a) $\{ \{6\} \}$ (b) $\{ \Phi, 6\}$ (c) $\{ \{\Phi\}, \{6\} \}$ (d) $\{ \Phi, \{6\} \}$

Solution:

> **Note:** Power set is a set of all subsets of set A, that are Φ and $\{6\}$.

The answer is (d).

EXERCISE 1.1

(1) If $A = \{2,6,7\}$, then which of the following is not true?

    (a) $6 \in A$ (b) $\{2\} \subset A$ (c) $\{7\} \in A$ (d) $\{2,6,7\} \subseteq A$

(2) If $B = \{ \Phi, \{2\}, \{6\}, \{2,6\}\}$, then which of the following is true?

    (a) $\{2,6\} \subset B$ (b) $\{2,6\} \in B$ (c) $6 \in B$ (d) None

(3) $A = \{1,6,8,9\}$

    Total number of subsets of $A =$?

    (a) 16   (b) 4   (c) 8   (d) 12

OPERATIONS IN SETS

MCQ-4:

If $A = \{2,3,5\}$ and $U = \{1,2,3,4,5\}$ then

$A' = ?$

    (a) $\{1,3,5\}$ (b) $\{1,4\}$ (c) $\{1,2,3,4,5\}$ (d) $\{1\}$

Solution:

$$A' = U - A$$

$$A' = \{1,4\}$$

The answer is (b).

MCQ-5:

$A \cap B' = ?$ if

$A = \{1,2,6\}$, $B = \{2,3,5\}$, $U = \{1,2,3,4,5,6\}$

    (a) $\{1,2,6\}$ (b) $\{1,2,4,6\}$ (c) $\{1,6\}$ (d) $\{2\}$

Solution:

$$B' = U - B$$

$$B' = \{1,4,6\}$$

$$A \cap B' = \{1,6\}$$

The answer is (c).

MCQ-6:

If $A = \{2\}$ and $B = \{5,7\}$ then

$$A \times B = ?$$

    (a) $\{(2,5),(2,7),(5,2),(7,2)\}$ (b) $\{10,14\}$

    (c) $\{(5,2),(7,2)\}$ (d) None

Solution:

$$A \times B = \{2\} \times \{5,7\}$$

$$A \times B = \{(2,5),(2,7)\}$$

The answer is (d).

MCQ-7:

If $A = \{1,3,5\}$ and $B = \{1,5,6\}$ then

$A - B =?$

    (a) $\{0,2,1\}$ (b) $\{1,5\}$ (c) $\{3,6\}$ (d) $\{3\}$

Solution:

> **Note:** $(A - B)$ is the set of all the elements of set A only, except the elements which are common in A and B.

$$A - B = \{1,3,5\} - \{1,5,6\}$$

$$A - B = \{3\}$$

The answer is (d).

EXERCISE 1.2

(1) $A \cap B =?$, if $A = \{1,2,3,4\}$ and $B = \{2,5,6\}$.

    (a) $\{2,5\}$ (b) $\{2\}$ (c) Φ (d) None

(2) $A' \cap B =?$, if $A = \{8,12\}$, $B = \{6,9,12\}$ and

    $U = \{5,6,7,8,9,10,11,12,13,14\}$

    (a) $\{6,9,12\}$ (b) Φ (c) $\{6,9\}$ (d) A

(3) $A \cup B =?$, if $A = \{8,12\}$, $B = \{6,9,12\}$ and

    $U = \{5,6,7,8,9,10,11,12,13,14\}$

    (a) $\{6,8,9,12\}$ (b) $\{6,8,9,12,14\}$

    (c) $\{4,5,6,7,8,9,10,11,12,13,14\}$ (d) $\{12\}$

(4) $A - B =?$, if $A = \{2,3,4\}$ and $B = \{2,3,5\}$.

    (a) $\{4,5\}$ (b) $\{4\}$ (c) $\{5\}$ (d) $\{4,-5\}$

(5) $B - A =?$, if $A = \{2,3\}$ and $B = \{5,6\}$.

    (a) $\{2,3\}$ (b) $\{5,6\}$ (c) $\{2,-5,3,-6\}$ (d) $\{2,3,5,6\}$

(6) $B \times A =?$, if $A = \{2\}$ and $B = \{0\}$.

    (a) $\{0,2\}$ (b) $\{(2,0)\}$ (c) $\{(0,2)\}$ (d) Φ

(7) $B \times A =?$, if $A = \{5\}$ and $B = \{1,3\}$.

    (a) $\{5,15\}$ (b) $\{1,3,5\}$ (c) $\{(5,1),(5,3)\}$ (d) $\{(1,5),(3,5)\}$

(8) $A \cup B = $ _____, if $A \subseteq B$.

    (a) A (b) B (c) U (d) None

(9) $A \cap B =$ _____, if $B \subseteq A$.

    (a) A (b) B (c) Φ (d) None

(10) $A \cap A' =$ _____.

    (a) Φ (b) A (c) A' (d) U

(11) $A \cup A' =$ _____.

    (a) Φ (b) A (c) A' (d) U

DE MORGAN'S LAWS

If A and B are two sets, then

$$(i) \quad (A \cup B)' = A' \cap B'$$

$$(ii) \quad (A \cap B)' = A' \cup B'$$

MCQ-8:

If $A' = \{2,3\}$, $B' = \{1,3\}$ and $U = \{1,2,3\}$, then $(AUB)' =$?

    (a) $\{1,2,3\}$ (b) $\{3\}$ (c) $\{1,2\}$ (d) None

Solution:

> By De Morgan's law
> $$(A \cup B)' = A' \cap B'$$

$$(A \cup B)' = \{3\}$$

The answer is (b).

EXERCISE 1.3

(1) If $A' = \{2,4\}$, $B' = \{2,5\}$ and $U = \{1,2,3,4,5\}$, then $(A \cap B)' =$?

    (a) $\{4,5\}$ (b) $\{1,3\}$ (c) $\{2\}$ (d) $\{2,4,5\}$

(2) If $A' = \{1,5\}$ and $B' = \{2,5\}$ then $(A \cup B)' =$?

    (a) $\{5\}$ (b) Φ (c) $\{1,2,5\}$ (d) $\{1,2\}$

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