

Topic : Fundamentals of Mathematics

Type of Questions

M.M., Min.

Comprehension (no negative marking) Q.1 to 3	(3 marks, 3 min.)	[9, 9]
Single choice Objective (no negative marking) Q.4	(3 marks, 3 min.)	[3, 3]
True or False (no negative marking) Q.5	(2 marks, 2 min.)	[2, 2]
Subjective Questions (no negative marking) Q.6,7,8,9	(4 marks, 5 min.)	[16, 20]

COMPREHENSION (Q.No. 1 to 3)

Consider the equation $2^{|x+1|} - 2^x = |2^x - 1| + 1$

- The least value of x satisfying the equation is
(A) 0 (B) 2 (C) 4 (D) none of these
- Number of integers less than 15 satisfying the equation are
(A) 14 (B) 15 (C) 16 (D) none of these
- Number of composite numbers less than 20 which are coprime with 4 satisfying the given equation is/ are
(A) 2 (B) 3 (C) 4 (D) 5
- If the solution of the equation $|(x^4-9) - (x^2+3)| = |x^4-9| - |x^2+3|$ is $(-\infty, p] \cup [q, \infty)$ then value of $p+q$ is
(A) 0 (B) 4 (C) 1 (D) -1
- State whether the following statements are **True** or **False**
 - If $\frac{1}{|a|} > \frac{1}{b}$, then $|a| < b$, where a & b are non-zero real numbers.
 - If $\frac{1}{a} > \frac{1}{|b|}$, then $a < |b|$, where a & b are non-zero real numbers.
- Simplify : $\frac{x}{x-y} - \frac{y}{x+y} - \frac{2xy}{x^2-y^2}$
- Solve the following equations
 - $|x| + 2|x-6| = 12$
 - $||x+3| - 5| = 2$
 - $||x-2| - 2| - 2| = 2$
- Let $f(x) = |x-2| + |x-4| - |2x-6|$, then find the sum of the largest and smallest values of $f(x)$ if $x \in [2, 8]$.
- Draw the labelled graph of following
 - $y = |7-2x|$
 - $y = |x-1| - |3x-2|$
 - $y = |x-1| + |x-4| + |x-7|$

Answers Key

1. (D) 2. (C) 3. (A) 4. (A)

5. (i) False (ii) True 6. $\frac{x-y}{x+y}$

7. (i) $x = 0, 8$ (ii) $x = -10, -6, 0, 4$
 (iii) $x = 0, \pm 4, 8$ 8. 2

