

Super-30

(NM-I)

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MATHEMATICS

Daily Practice Problems
Target IIT JEE 2020

Topic : Fundamentals of Mathematics

DPP. NO.-12

Type of Questions

M.M., Min.

Short Subjective Questions (no negative marking) Q.1 to 10

(4 marks, 5 min.)

[40, 50]

1. $\frac{x^2 - 7|x| + 10}{x^2 - 6x + 9} < 0$

2. $\frac{|x+3| + x}{x+2} > 1$

3. $\frac{|x+2| - x}{x} < 2$

4. $\frac{1}{|x|-3} < \frac{1}{2}$

5. $|x| - |x-2| \geq 1$

6. $|x^3 - 1| \geq 1 - x$

7. $|x^2 - 4x + 4| \geq 1$

8. $\left| \frac{3x}{x^2 - 4} \right| \leq 1$

9. $\left| \frac{x^2 - 5x + 4}{x^2 - 4} \right| \leq 1$

10. $\frac{|x-3|}{x^2 - 5x + 6} \geq 2$

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
 - $y = |7-2x|$
 - $y = |x-1| - |3x-2|$
 - $y = |x-1| + |x-4| + |x-7|$