

Topic : Fundamentals of Mathematics

Type of Questions

Single choice Objective (no negative marking) Q.11, 12

(3 marks, 3 min.)

M.M., Min.

[6, 6]

Subjective Questions (no negative marking) Q.1 to 10 and 13,14,15

(4 marks, 5 min.)

[52, 65]

Solve the following inequality

1. $|x - 3| < 5$

2. $2 \leq |x - 1| \leq 3$

3. $|x - 1| \leq 5$ and $|x| \geq 2$

4. $|x - 1| + |x - 2| \leq 4$

5. $\frac{|x|+1}{|x|-2} \geq 0, x \in \mathbb{R}, x \neq \pm 2$

6. $\frac{-1}{|x|-2} \geq 1$, where $x \in \mathbb{R}, x \neq \pm 2$

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

8. $||x - 2| - 1| \geq 3$

9. $|(x^2 + 2x + 2) + (3x + 7)| < |x^2 + 2x + 2| + |3x + 7|$

10. $|x^2 - 1| + |x^2 - 4| \leq 3$

11. The solution of $|x^2 + 3x| + x^2 - 2 \geq 0$ is :

(A) $(-\infty, 1)$

(B) $(0, 1)$

(C) $\left(-\infty, -\frac{2}{3}\right] \cup \left[\frac{1}{2}, \infty\right)$

(D) None of these

12. The solution of $||x| - 1| < |1 - x|, x \in \mathbb{R}$ is :

(A) $(-1, 1)$

(B) $(0, \infty)$

(C) $(-1, \infty)$

(D) None of these

13. Solve : $|x^2 + 4x + 3| + 2x + 5 = 0$

14. Solve $|x^2 - 3x - 4| = 9 - |x^2 - 1|$

15. Solve the inequality $|f(x) - g(x)| < |f(x)| + |g(x)|$, where $f(x) = x - 3$ and $g(x) = 4 - x$

Answers Key

1. $x \in (-2, 8)$

2. $x \in [-2, -1] \cup [3, 4]$

3. $x \in [-4, -2] \cup [2, 6]$ 4. $x \in \left(-\infty, -\frac{1}{2}\right] \cup \left[\frac{7}{2}, \infty\right)$

5. $x \in (-\infty, -2) \cup (2, \infty)$ 6. $(-2, -1] \cup [1, 2)$

7. $x \in [-3, -2) \cup (-1, \infty)$ 8. $(-\infty, -2] \cup [6, \infty)$

9. $x < -\frac{7}{3}$ 10. $x \in [-2, -1] \cup [1, 2]$

11. (C) 12. (D) 13. $\{-4, -1, -1 - \sqrt{3}\}$

14. $\{-2, 2\}$ 15. $x \in (3, 4)$