JEE (Main + Advanced): NURTURE COURSE

TARGET : JEE (M + A) 2021

Topic : BASIC MATHS (Wave Curve) **DPP-3**

1. Find the value of x satisfying

$$\frac{(x-1)}{(x+2)} \geq \frac{(x-3)}{(x+4)}$$

(a) $(-4,-2) \cup \left[-\frac{1}{2}, \infty\right)$ (b) $[-4,-2]$ (c) $[-4,\infty)$ (d) $\left[-2,-\frac{1}{2}\right]$

2. Find the value of 'x' satisfying $(x-1)(x-3) \leq 0$ and $(x-2)(x-4) \geq 0$

(a) $[0,2]$ (b) $[1,2]$ (c) $[0,1]$ (d) $[4,\infty]$

3. Find the value of 'x' satisfying

$$x(x-1)^2(x-3) \leq 0$$

(a) $[-1,1]$ (b) $[1,5]$ (c) $[0,5]$ (d) $[0,3]$

4. Find the value of x satisfying

$$x(x-1)^2(x-2)^3(x-3)^4 \leq 0$$

(a) $[0,2] \cup \{3\}$ (b) $[3,\infty)$ (c) $[0,5]$ (d) $[0,3)$

5. Find the value of x satisfying

$$(x^2+x+1)(x^2-x+1)(x^2+x-1) \leq 0$$

(a) $\left[1,\sqrt{5}\right]$ (b) $\left[\frac{-1-\sqrt{5}}{2}, \frac{-1+\sqrt{5}}{2}\right]$

(c) $\left[-\sqrt{5},-1\right]$ (d) $\left[-\sqrt{5},\sqrt{5}\right]$

6. Find the value of x satisfying

$$\frac{2x}{x^2+4x+3} \geq 1$$

(a) $(1,\infty)$ (b) $(-2,0)$ (c) $(-3,-1)$ (d) $(0,1)$

7. Find the value of x satisfying

$$x(x^2-1)+x^2(x-1) \leq 0$$

(a) $\left[-\frac{1}{2},0\right]$ (b) $[1,\infty)$ (c) $[0,\infty)$ (d) $\left(-\infty,-\frac{1}{2}\right] \cup [0,1]$

8. Find the value of x satisfying

$$\frac{x^3+2x^2+2x+1}{x^3+3x^2+3x+2}\le 0$$

(a) $(-2,-1]$ (b) $(-\infty,-2)$ (c) $(-1,\infty)$ (d) $(1,\infty)$

9. Solve $\frac{2x}{(x^2-4)}\le\frac{1}{(x+1)}$

(a) $(-1,\infty)$ (b) $(-2,-1)$ (c) $(2,\infty)$ (d) $(-\infty,-2)\cup(-1,2)$

10. If $(x^2+x)^2-3(x^2+x)+2\ge 0$
then find the value of x satisfying above inequality

(a) $[1,\infty)$ (b) $(-\infty.-2]$

(c) $[-2,1]$ (d) $(-\infty,-2]\cup\left[\frac{-1-\sqrt{5}}{2},\frac{-1+\sqrt{5}}{2}\right]\cup[1,\infty)$

11. Find the value of X satisfying the inequality

$(x+1)^2-(x^2+1)^2\ge 0$

(a) $[0,1]$ (b) $[1,\infty]$ (c) $[2,3]$ (d) $[0,3]$

12. Find the value of X satisfying the inequality,

$$\frac{2x}{(x^2+1)}\ge\frac{1}{x}$$

(a) $[-1,0)\cup[1,\infty)$ (b) $[0,1]$ (c) $[0,\infty)$ (d) $[1,\infty)$

13. Find the value of X satisying

$(x^2-2x+1)(x^2-2x+3)\le 0$

(a) {1} (b) $[1,\infty)$ (c) $(-\infty,\infty)$ (d) None of these

14. Consider a polynomial P(X) of degree 4 with leading coefficient unity such that $P(1)=3;P(2)=6;P(3)=9$ and $P(4)=12$ then find $P(5)=?$

(a) 36 (b) 37 (c) 38 (d) 39

15. Consider $\alpha = 2 + i + i^2 + i^3$ to be a factor of $x^3 + 2x^2 + x - a$ then find the value of a?

(a) 1 (b) 2 (c) 3 (d) 4

16. Let $(x-1)^2$ is a factor of $x^3 - bx^2 - ax + 1$ then find the value of (a-b) ?

(a) 0 (b) 1 (c) 2 (d) 3

17. Find the least positive integral value of x satisfying the inequality,

$(x-4)^5 (x-5)^4 (x-6)^3 \le 0$

(a) 4 (b) 5 (c) 6 (d) 7

18. Find the greatest positive integral value of x satisfying the in equality;

$(x-1)(x-2)(x-3)(x-4) \le 0$

(a) 1 (b) 2 (c) 3 (d) 4

19. Consider, $a = \sqrt{(6+2\sqrt{5})} - \sqrt{(6-2\sqrt{5})}$

Let a is a factor of $x^3 + bx^2 - 16$ then find the value of 'b'

(a) 1 (b) 2 (c) 3 (d) 4

20. Find the value of x satisfying the in equality;

$$\frac{3x}{x^2 + x + 1} \ge 1$$

(a) 1 (b) 2 (c) 3 (d) 4