DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :3**

Topic :-LINEAR INEQUALITIES

1. The number of real solutions of the equation $27^{1/x} + 12^{1/x} = 2.8^{1/x}$, is
   a) 1 b) 2 c) 0 d) Infinite

2. If roots of the equation $x^4 - 8x^3 + bx^2 + cx + 16 = 0$ are positive then
   a) $b = 8 = c$ b) $b = -24, c = -32$ c) $b = 24, c = -32$ d) $b = 24, c = 32$

3. If $3<|x|<6$, then x belongs to
   a) $(-6, -3) \cup (3,6)$ b) $(-6, 6)$ c) $(-3, -3) \cup (3,6)$ d) None of these

4. If a, b are distinct positive real numbers, then which one of the following is true?
   a) $a^4 + b^4 > a^3b + ab^3$ b) $a^4 + b^4 < a^3b + ab^3$ c) $a^3 + b^3 < a^2b + ab^2$ d) None of these

5. The solution of the inequation $4^{-x+0.5} - 7 \cdot 2^{-x} < 4, x \in R$ is
   a) $(-2, \infty)$ b) $(2, \infty)$ c) $\left(2, \frac{7}{2}\right)$ d) None of tnese

6. Suppose a, b and c are real numbers such that $\frac{a}{b} > 1$ and $\frac{a}{c} < 0$. Which one of the following is true?
   a) $a + b - c > 0$ b) $a > b$ c) $(a - c)(b - c) > 0$ d) $a + b + c > 0$

7. If a, b, c are positive real numbers such that $a + b + c = p$ then, which of the following is true?
   a) $(p - a)(p - b)(p - c) \geq \frac{1}{27}p^3$
   b) $(p - a)(p - b)(p - c) \geq 8abc$
   c) $\frac{bc}{a} + \frac{ca}{b} + \frac{ab}{c} \geq p$
   d) None of these

8. The number of solutions of the equation $\frac{(1+e^{x^2})\sqrt{1+x^2}}{\sqrt{1+x^4}-x^2} = 1 + \cos x$, is
   a) 1 b) 2 c) 3 d) 4

9. Let n be an odd integer such that the polynomial $P_n(x) = 1 + 2x + 3x^2 + \ldots\ldots + (n+1)x^n$ has exactly one real root. This real root α satisfies
   a) $-1 < \alpha < 0$ b) $0 < \alpha < 1$ c) $0 \leq \alpha \leq 1$ d) $-1 \leq \alpha \leq 0$

10. Let a, b be integers and $f(x)$ be a polynomial with integer coefficients such that $f(b) - f(a) = 1$. Then, the value of $b - a$, is
    a) 1 b) -1 c) $1, -1$ d) None of these

11. Let $y = \sqrt{\frac{(x+1)(x-3)}{(x-2)}}$,then all real values of x for which$y$ takes real values, are
a) $-1 \leq x < 2$ or$x \geq 3$ b) $-1 \leq x < 3$ or $x > 2$ c) $1 \leq x < 2$ *or* $x \geq 3$ d) None of these

12. If $a, b, c > 0$ and if $abc = 1$, then the value of $a + b + c + ab + bc + ca$ lies in the interval
a) $(\infty, -6)$ b) $(-6, 0)$ c) $(0, 6)$ d) $(6, \infty)$

13. The number of real roots of the equation $(\sin 2^x)(\cos 2^x) = \frac{2^x + 2^{-x}}{2}$, is
a) 1 b) 2 c) 3 d) None of these

14. The largest interval for which $x^{12} - x^9 + x^4 - x + 1 > 0$ is
a) $-4 < x \leq 0$ b) $0 < x < 1$ c) $-100 < x < 100$ d) $0 < x < \infty$

15. The number of negative real roots of $x^4 - 4x - 1 = 0$, is
a) 3 b) 2 c) 1 d) 0

16. If $0 < x < \frac{\pi}{2}$, then minimum value of $\frac{\cos^3 x}{\sin x} + \frac{\sin^3 x}{\cos x}$is
a) $\sqrt{3}$ b) $\frac{1}{2}$ c) $\frac{1}{3}$ d) 1

17. The number of solutions of $\sqrt{3x^2 + 6x + 7} + \sqrt{5x^2 + 10x + 14} = 4 - 2x - x^2$, is
a) 1 b) 2 c) 3 d) 4

18. The solution set of $||x|-1| < |1 - x|, x \in R$ is
a) $(-1,1)$ b) $(0, \infty)$ c) $(-1, \infty)$ d) None of these

19. The minimum value of $f(x) = |3 - x| + 7$ is
a) 0 b) 6 c) 7 d) 8

20. The solution set of the inequation$\frac{x+11}{x-3} > 0$ is
a) $(-\infty, 11) \cup (3, \infty)$ b) $(-\infty, -10) \cup (2, \infty)$ c) $(-100, -11) \cup (1, \infty)$ d) $(-5, 0) \cup (3, 7)$