DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :4**

Topic :-LINEAR INEQUALITIES

1. Solution of $2x - 1 = |x + 7|$ is
   a) -2 b) 8 c) $-2, 8$ d) None of these

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

3. The solution set of the inequality $\log_{\sin(\frac{\pi}{3})}(x^2 - 3x + 2) \geq 2$ is
   a) $\left(\frac{1}{2}, 2\right)$ b) $\left(1, \frac{5}{2}\right)$ c) $\left[\frac{1}{2}, 1\right) \cup \left(2, \frac{5}{2}\right]$ d) None of these

4. If a, b, c are sides of triangle, then $\frac{(a+b+c)^2}{(ab+bc+ca)}$ always belongs to
   a) [1, 2] b) [2, 3] c) [3, 4] d) [4, 5]

5. $(x - 1)(x^2 - 5x + 7) < (x - 1)$, then x belongs to
   a) $(1, 2) \cup (3, \infty)$ b) $(-\infty, 1) \cup (2, 3)$ c) 2, 3 d) None of these

6. The set of values of x for which the inequalities $x^2 - 3x - 10 < 0$, $10x - x^2 - 16 > 0$ hold simultaneously, is
   a) (-2, 5) b) (2, 8) c) (-2, 8) d) (2, 5)

7. The solution of the inequation $\log_{1/3}(x^2 + x + 1) + 1 < 0$ is
   a) $(-\infty, -2) \cup (1, \infty)$ b) $[-1, 2]$ c) $(-2, 1)$ d) $(-\infty, \infty)$

8. The number of values of a for which the system of equation $2^{|x|} + |x| = y + x^2 + a$ and $x^2 + y^2 = 1$ has only one solution where a, x, y are real, is
   a) 1
   b) 2
   c) Finitely many but more than 2
   d) Infinitely many

9. The solution set of the inequation $\log_{1/3}(x^2 + x + 1) + 1 > 0$, is
   a) $(-\infty, -2) \cup (1, \infty)$ b) $[-1, 2]$ c) $(-2, 1)$ d) R

10. The set of all real numbers satisfying the inequation $x^{(\log_{10} x)^2 - 3(\log_{10} x)+1} > 1000$, is
a) $(0, 1000)$ b) $(1000, \infty)$ c) $(0, 100)$ d) None of these

11. The set of all real x satisfying the inequality $\frac{3-|x|}{4-|x|} > 0$
a) $[-3, 3] \cup (-\infty, -4) \cup (4, \infty)$ b) $(-\infty, -4) \cup (4, \infty)$
c) $(-\infty, -3) \cup (4, \infty)$ d) $(-\infty, -3) \cup (3, \infty)$

12. For positive real number a,b,c which of the following holds?
a) $a+b+c > 3 \Rightarrow a^2+b^2+c^2 > 3$ b) $a^6 + b^6 \leq 12a^2b^2 - 64$
c) $a+b+c = \alpha \Rightarrow \frac{1}{a} + \frac{1}{b} + \frac{1}{c} \leq \frac{9}{\alpha}$ d) None of the above

13. If a_1, a_2, a_3 be any positive real numbers, then which of the following statements is not true
a) $3a_1, a_2, a_3 \leq a_1^3 + a_2^3 + a_3^3$
b) $\frac{a_1}{a_2} + \frac{a_2}{a_3} + \frac{a_3}{a_1} \geq 3$
c) $(a_1 + a_2 + a_3)\left(\frac{1}{a_1} + \frac{1}{a_2} + \frac{1}{a_3}\right) \geq 9$
d) $(a_1 + a_2 + a_3)\left(\frac{1}{a_1} + \frac{1}{a_2} + \frac{1}{a_3}\right)^3 \leq 27$

14. If $x^2 + \frac{1}{x^2} = A$ and $x - \frac{1}{x} = B$, where $x \in R$ and $B > 0$, then the minimum value of $\frac{A}{B}$ is
a) $\sqrt{2}$ b) $2\sqrt{2}$ c) $\sqrt{2} + 2$ d) None of these

15. Let n be an odd positive integer. Then, the number of real roots of the polynomial $P_n(x) = 1 + 2x + 3x^2 + \ldots\ldots + (n+1)x^n$, is
a) 0 b) n c) 1 d) None of these

16. The number of positive integers satisfying the inequality $n + 1_{C_{n-2}} - n + 1_{C_{n-1}} \leq 50$ is
a) 9 b) 8 c) 7 d) 6

17. For $\theta > \pi/3$, the value of $f(\theta) = \sec^2\theta + \cos^2\theta$ always lies in the interval
a) $(0, 2)$ b) $[0, 1]$ c) $(1, 2)$ d) $[2, \infty)$

18. If the product of n positive numbers is n^n, then their sum is
a) A positive integer b) Divisible by n c) Equal to $n + \frac{1}{n}$ d) Never less than n^2

19. $\log_2(x^2 - 3x + 18) < 4$, then x belongs to
a) $(1, 2)$ b) $(2, 16)$ c) $(1, 16)$ d) None of these

20. If $[x]^2 = [x+6]$, where $[x] =$ the greatest integer less than or equal to x, then x must be such that
a) $x = 3, -2$ b) $x \in [-2, -1)$ c) $x \in [3, 4)$ d) $x \in [-2, -1) \cup [3, 4)$