DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :8**

Topic :-LINEAR INEQUALITIES

1. $\log_{16} x^3 + (\log_2 \sqrt{x})^2 < 1$ iff x lies in
   a) (2, 16) b) (0,1/16) c) (1/16 ,2) d) None of these

2. If $\log_{\cos x} \sin x > 2$ and $0 < x < 3\pi$,then $\sin x$ lies in the interval
   a) $\left[\frac{\sqrt{5}-1}{2},1\right]$ b) $\left[0,\frac{\sqrt{5}-1}{2}\right]$ c) $\left[0,\frac{1}{2}\right]$ d) None of these

3. If $f(x) = x^2 + 2bx + 2c^2$ and $g(x) = -x^2 - 2cx + b^2$ such that $\min f(x) > \max g(x)$, then the relation between b and c, is
   a) No real value of b and c b) $0 < c < b\sqrt{2}$ c) $|c| < |b|\sqrt{2}$ d) $|c| > |b|\sqrt{2}$

4. If the sum of the greatest integer less than or equal to x and the least integer greater than or equal to x is 5, then the solution set for x is
   a) (2, 3) b) (0, 5) c) [5, 6) d) None of these

5. The total number of roots of the equation $|x - x^2 - 1| = |2x - 3 - x^2|$ is
   a) 1 b) 2 c) 0 d) Infinitely many

6. For $\frac{|x-1|}{x+2} < 1$, x lies in the interval
   a) $(-\infty, -2) \cup \left(-\frac{1}{2}, \infty\right)$ b) $(-\infty, 1) \cup [2, 3]$ c) $(-\infty, -4)$ d) $\left[-\frac{1}{2}, 1\right]$

7. Number of integer solutions of $\frac{x+2}{x^2+1} > \frac{1}{2}$ is
   a) 0 b) 1 c) 2 d) 3

8. Solution of the inequality $\tan\left(x + \frac{\pi}{3}\right) \geq 1$ is
   a) $\left(n\pi + \frac{\pi}{12}, n\pi + \frac{\pi}{6}\right)$ b) $\left(n\pi - \frac{\pi}{12}, n\pi + \frac{\pi}{6}\right)$ c) $\left(n\pi - \frac{\pi}{6}, n\pi - \frac{\pi}{12}\right)$ d) None of these

9. If $0 < a < 1$, then the solution set of the inequation $\frac{1 + (\log_a x)^2}{1 + (\log_a x)} > 1$, is
   a) $(1, 1/a)$ b) $(0, a)$ c) $(1, 1/a) \cup (0, a)$ d) None of these

10. Let $x = \frac{a+2b}{a+b}$ and $y = \frac{a}{b}$, wherer a and b are positive integers. If $y^2 > 2$, then

a) $x^2 \leq 2$ b) $x^2 < 2$ c) $x^2 > 2$ d) $x^2 \geq 2$

11. The minimum value of $|\sin x + \cos x + \tan x + \sec x + \text{cosec}\, x + \cot x|$ is
a) $2\sqrt{2} - 1$ b) $2\sqrt{2} + 1$ c) $\sqrt{2} - 1$ d) $\sqrt{2} + 1$

12. If for $x \in R, \frac{1}{3} < \frac{x^2 - 2x + 4}{x^2 + 2x + 4} < 3$, then $\frac{9 \cdot 3^{2x} - 6 \cdot 3^x + 4}{9 \cdot 3^{2x} + 6 \cdot 3^x + 4}$ lies between
a) $\frac{1}{2}$ and 2 b) $\frac{1}{3}$ and 3 c) 0 and 2 d) None of these

13. The minimum value of $4^x + 4^{1-x}, x \in R$, is
a) 1 b) 2 c) 4 d) None of these

14. The number of real solutions of the equation $3^{-|x|} - 2^{|x|} = 0$, is
a) 0 b) 1 c) 2 d) None of these

15. The number of real roots of the equation $1 + 3^{x/2} = 2^x$, is
a) 0 b) 1 c) 2 d) None of these

16. If n is even and $n \geq 4, x_1, x_2, \ldots, x_n \geq 0$ and $x_1 + x_2 + \ldots + x_n = 1$, then $P = x_1x_2 + x_2x_3 + \ldots + x_n - x_n$ cannot exceed
a) $\frac{1}{n+1}$ b) $\frac{1}{n+2}$ c) $\frac{1}{2n}$ d) None of these

17. The number of real solutions of the equation $e^{-x} = x$, is
a) 0 b) 1 c) 2 d) None of these

18. The solution set contained in R of the inequation $3^x + 3^{1-x} - 4 < 0$, is
a) (1, 3) b) (0, 1) c) (1, 2) d) (0, 2)

19. The solution of the inequation $2x^2 + 3x - 9 \leq 0$ is given by
a) $\frac{3}{2} \leq x \leq 3$ b) $-3 \leq x \leq \frac{3}{2}$ c) $-3 \leq x \leq 3$ d) $\frac{3}{2} \leq x \leq 2$

20. If $0 < \theta < \pi$, then the minimum value of $\sin^5\theta + \text{cosec}^5\theta$ is
a) 0 b) 1 c) 2 d) None of these