DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :5**

Topic :-LINEAR INEQUALITIES

1. If $a, b, c > 0$, the minimum value of $\frac{a}{b+c} + \frac{b}{c+a} + \frac{c}{a+b}$ is
   a) 1 b) $\frac{3}{2}$ c) 2 d) $\frac{5}{2}$

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

3. If p,q,r are any real numbers, then
   a) $\max(p,q) = \max\ (p,q,r)$ b) $\min(p,q) = \frac{1}{2}(P + q - |p - q|)$
   c) $\max(p,q) < \min(p,q,r)$ d) $\max(p,q) = \frac{1}{2}(p + q - |p - q|)$

4. The number of real solutions of $1 + |e^x - 1| = e^x(e^x - 2)$, is
   a) 1 b) 2 c) 3 d) 4

5. The solution set of the inequation$\log_{\sin 2\pi/3}(x^2 - 3x + 2) \geq 2$, is
   a) $[1/2, 1)$ b) $(2, 5/2]$ c) $[1/2, 1) \cup (2, 5/2]$ d) $[1/2, 5/2]$

6. If $x^2 + 6x - 27 < 0$ and$x^2 - 3x - 4 < 0$, then
   a) $x > 3$ b) $x < 4$ c) $3 < x < 4$ d) $x = \frac{7}{2}$

7. If $x,y \in R$, then $\frac{1}{2}(x + y + |x - y|) = x$ holds iff
   a) $x > y$ b) $x < y$ c) $x = y$ d) $x \geq y$

8. The set of all x satisfying the inequality $\frac{4x-1}{3x+1} \geq 1$ is
   a) $\left(-\infty, -\frac{1}{3}\right) \cup \left[\frac{1}{4}, \infty\right]$ b) $\left(-\infty, -\frac{2}{3}\right) \cup \left[\frac{5}{4}, \infty\right]$ c) $\left(-\infty, -\frac{1}{3}\right) \cup [2, \infty)$ d) $\left(-\infty, -\frac{2}{3}\right)[4, \infty)$

9. The number of solutions of the inequality
$E = 2^{1/\sin^2\alpha_2} \cdot 3^{1/\sin^2\alpha_3} \ldots n^{1/\sin^2\alpha_n} < n!$
Where $\alpha_i \in (-\pi, 2\pi)$ for $i = 2, 3, \ldots, n$ is
   a) 0 b) 2^{n-1} c) 3^{n-1} d) None of these

10. The equation $e^x = x(x + 1), x < 0$ has

a) No real roots set
b) Exactly one real root
c) Two real roots
d) Infinitely many real roots

11. Let $F(x)$ be a function defined by $F(x) = x - [x], 0 \neq x \in R$, where $[x]$ is the greatest integer less than or equal to x. Then, the number of solutions of $F(x) + F\left(\frac{1}{x}\right) = 1$
a) 0 b) Infinite c) 1 d) 2

12. The set of all real numbers satisfying the inequation $2^x + 2^{|x|} \geq 2\sqrt{2}$, is
a) $(1/2, \infty)$
b) $\left(-\infty, \log_2(\sqrt{2}-1)\right)$
c) $(-\infty, 1/2)$
d) $[1/2, \infty) \cup \left(-\infty, \log_2(\sqrt{2}-1)\right)$

13. Solution of the inequality $\sin^4\left(\frac{x}{3}\right) + \cos^4\left(\frac{x}{3}\right) > \frac{1}{2}$, is given by
a) R b) $\frac{3n\pi}{2} + \frac{3\pi}{4}$
c) $R - \left\{\left(\frac{3n\pi}{2} + \frac{3\pi}{4}\right), n \in I\right\}$ d) None of these

14. If $(\log_5 x)^2 + (\log_5 x) < 2$, then x belongs to the interval
a) $(1/25, 5)$ b) $(1/5, 1/\sqrt{5})$ c) $(1, \infty)$ d) None of these

15. The number of real roots of the equation $x^2 + x + 3 + 2\sin x = 0$ in the interval $[-\pi, \pi]$, is
a) 2 b) 4 c) 6 d) None of these

16. If $\log_{\sqrt{3}}(\sin x + 2\sqrt{2}\cos x) \geq 2, -2\pi \leq x \leq 2\pi$, then the number of solutions of x is
a) 0 b) ∞ c) 3 d) 4

17. Solution of $x^{(\log_{10} x)^2 - 3\log_{10} x + 1} > 1000$ for $x \in R$, is
a) $(10, \infty)$ b) $(100, \infty)$ c) $(1000, \infty)$ d) $(1, \infty)$

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

19. The number of roots of the equation $\sin \pi x = |\log|x||$, is
a) 2 b) 4 c) 5 d) 6

20. The equation $\sqrt{x+1} - \sqrt{x-1} = \sqrt{4x-1}$ has
a) No solution
b) One solution
c) Two solutions
d) More than two solutions