DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :1**

Topic :-LINEAR INEQUALITIES

1. If $3^x + 2^{2x} \geq 5^x$, then the solution set for x is
   a) $(-\infty, 2]$ b) $[2, \infty)$ c) $[0, 2]$ d) $\{2\}$

2. $x^2 - 3|x| + 2 < 0$, then x belongs to
   a) $(1, 2)$ b) $(-2, -1)$ c) $(-2, -1) \cup (1, 2)$ d) $(-3, 5)$

3. Solution of $2^x + 2^{|x|} \geq 2\sqrt{2}$ is
   a) $(-\infty, \log_2(\sqrt{2}+1))$ b) $(0, 8)$
   c) $\left(\frac{1}{2}, \log_2(\sqrt{2}-1)\right)$ d) $(-\infty, \log_2(\sqrt{2}-1)) \cup \left[\frac{1}{2}, \infty\right)$

4. If $x_1, x_2, \ldots, x_n$ are real numbers, then the largest value of the expression $\sin x_1 \cos x_2 + \sin x_2 \cos x_3 + \ldots + \sin x_n \cos x_1$ is
   a) n b) $\frac{n}{2}$ c) $\frac{n}{4}$ d) $\sqrt{n^2 - 1}$

5. If $a < b$, then the solution $x^2 + (a+b)x + ab < 0$ is given by
   a) (a, b) b) $(-\infty, a) \cup (b, \infty)$ c) $(-b, -a)$ d) $(-\infty, -b) \cup (-a, \infty)$

6. If $\log(x^3 + y^3) - \log_{10}(x^2 + y^2 - xy) \leq 2$, then the maximum value of xy, for all $x \geq 0, y \geq 0$ is
   a) 2500 b) 3000 c) 1200 d) 3500

7. If $3^{x/2} + 2^x > 25$, then the solution set is
   a) R b) $(2, \infty)$ c) $(4, \infty)$ d) None of these

8. If $ab = 4 (a, b \in R^+)$, then
   a) $a + b \leq 4$ b) $a + b = 4$ c) $a + b \geq 4$ d) None of these

9. Let $P_n(x) = 1 + 2x + 3x^2 + \ldots + (n+1)x^n$ be a polynomial such that n is even. Then, the number of real roots of $P_n(x)$, is
   a) 0 b) n c) 1 d) None of these

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

11. If $x = \log_{2^2} 2 + \log_{2^3} 2^2 + \log_{2^4} 2^3 + \ldots + \log_{2^{n+1}} 2^n$, then

a) $x \geq \left(\frac{1}{n+1}\right)^{1/n}$ b) $x \geq n\left(\frac{1}{n+1}\right)^{1/n}$ c) $x \geq \left(\frac{n}{n+1}\right)^{1/n}$ d) None of these

12. The number of real solutions (x,y,z,t) of simultaneous equations $2y = \frac{11}{x} + x, 2z = \frac{11}{y} + y, 2t = \frac{11}{z} + z, 2x = \frac{11}{t} + t$, is

a) 0 b) 1 c) 2 d) 4

13. 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) $(0, 2)$

14. The range of ab if $|a| \leq 1$ and $a + b = 1, (a,b \in R)$, is

a) $[0, 1/4]$ b) $[-2, 1/4]$ c) $[1/4, 2]$ d) $[0, 2]$

15. If $\sqrt{9x^2 + 6x + 1} < (2 - x)$, then

a) $x \in \left(-\frac{3}{2}, \frac{1}{4}\right)$ b) $x \in \left(-\frac{3}{2}, \frac{1}{4}\right)$ c) $x \in \left[-\frac{3}{2}, \frac{1}{4}\right]$ d) $x < \frac{1}{4}$

16. If $5^x + (2\sqrt{3})^{2x} \geq 13^x$, then the solution set for x is

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

17. Solution set of inequality $\log_e \frac{x-2}{x-3}$ is

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

18. If $3 < 3t - 18 \leq 18$, then which one of the following is true?

a) $15 \leq 2t + 1 \leq 20$ b) $8 \leq t < 12$ c) $8 \leq t + 1 \leq 13$ d) $21 \leq 3t \leq 24$

19. Let $f(x) = ax^2 + bx + c$ and $f(-1) < 1, f(1) > -1, f(3) < -4$ and $a \neq 0$, then

a) $a > 0$ b) $a < 0$

c) Sign of a cannot be determined d) None of the above

20. The set of admissible values of x such that $\frac{2x+3}{2x-9} < 0$ is

a) $\left(-\infty, -\frac{3}{2}\right) \cup \left(\frac{9}{2}, \infty\right)$ b) $(-\infty, 0) \cup \left(\frac{9}{2}, \infty\right)$ c) $\left(-\frac{3}{2}, 0\right)$ d) $\left(-\frac{3}{2}, \frac{9}{2}\right)$