

## DPP

DAILY PRACTICE PROBLEMS

**CLASS : XIth**  
**DATE :**

**SUBJECT : MATHS**  
**DPP NO. :2**

### Topic :- LINEAR INEQUALITIES

- The number of irrational solutions of the equation  $\sqrt{x^2 + \sqrt{x^2 + 11}} + \sqrt{x^2 - \sqrt{x^2 + 11}} = 4$ , is
  - 0
  - 2
  - 4
  - 11
- The number of solutions of the equation  $\log_{x-3}(x^3 - 3x^2 - 4x + 8) = 3$ , is
  - 1
  - 2
  - 3
  - 4
- The number of real solutions of the equation  $\log_{0.5} x = |x|$ , is
  - 1
  - 0
  - 2
  - None of these
- The number of complex roots of the equation  $x^4 - 4x - 1 = 0$ , is
  - 3
  - 2
  - 1
  - 0
- If  $\sin^x \alpha + \cos^x \alpha \geq 1, 0 < \alpha < \frac{\pi}{2}$ , then
  - $x \in (2, \infty)$
  - $x \in (-\infty, 2]$
  - $x \in [-1, 1]$
  - None of these
- Consider the following statements:
  - $\frac{x}{1+x^2} < \tan^{-1} x < x; x > 0$
  - If  $0 \leq x < \frac{\pi}{2}$ ,  $\sin x + \tan x - 3x \geq 0$
 Which of these is/are correct?
  - Only (1)
  - Only (2)
  - (1) and (2)
  - None of these
- The number of solutions of the equation  $2 \cos(e^x) = 3^x + 3^{-x}$ , is
  - 0
  - 1
  - 2
  - None of these
- The number of real solutions of the equation  $1 - x = [\cos x]$ , is
  - 1
  - 2
  - 3
  - None of these
- Non-negative real numbers such that  $a_1 + a_2 + \dots + a_n = p$  and  $q = \sum_{i < j} a_i a_j$ , then
  - $q \leq \frac{1}{2} p^2$
  - $q > \frac{1}{4} p^2$
  - $q < \frac{p}{2}$
  - $q > \frac{p^2}{2}$
- If  $(\sin \alpha)^x + (\cos \alpha)^x \geq 1, 0 < \alpha < \frac{\pi}{2}$ , then
  - $x \in [2, \infty)$
  - $x \in (-\infty, 2]$
  - $x \in [-1, 1]$
  - None of these
- If  $x^2 + 2ax + 10 - 3a > 0$  for all  $x \in R$ , then
  - $-5 < a < 2$
  - $a < -5$
  - $a > 5$
  - $2 < a < 5$

12. The least integer satisfying  $49.4 - \left(\frac{27-x}{10}\right) < 47.4 - \left(\frac{27-9x}{10}\right)$ , is  
 a) 2                                      b) 3                                      c) 4                                      d) None of these
13. For positive real number  $a, b, c$  which one of the following holds?  
 a)  $a^2 + b^2 + c^2 \geq bc + ca + ab$                                       b)  $(b+c)(c+a)(a+b) \leq 8abc$   
 c)  $\frac{a}{b} + \frac{b}{c} + \frac{c}{a} \leq 3$                                       d)  $a^3 + b^3 + c^3 \leq 3abc$
14. The least perimeter of a cyclic quadrilateral of given area  $A$  square units is  
 a)  $\sqrt{A}$                                       b)  $2\sqrt{A}$                                       c)  $3\sqrt{A}$                                       d)  $4\sqrt{A}$
15. The number of solutions of  $[\sin x + \cos x] = 3 + [-\sin x] + [-\cos x]$  in the interval  $[0, 2\pi]$  is (where  $[.]$  denotes the greatest integer function)  
 a) 0                                      b) 4                                      c) Infinite                                      d) 1
16. The number of solutions of  $3^{|x|} = |2 - |x||$  is  
 a) 0                                      b) 2                                      c) 4                                      d) Infinite
17. If  $C$  is an obtuse angle in triangle, then  
 a)  $\tan A \tan B < 1$                       b)  $\tan A \tan B > 1$                       c)  $\tan A \tan B = 1$                       d) None of these
18. If  $x, y, z$  are three real numbers such that  $x + y + z = 4$  and  $x^2 + y^2 + z^2 = 6$ , then the exhaustive set of values of  $x$ , is  
 a)  $[2/3, 2]$                                       b)  $[0, 2/3]$                                       c)  $[0, 2]$                                       d)  $[-1/3, 2/3]$
19. The number of roots of the equation  $[\sin^{-1} x] = x - [x]$ , is  
 a) 0                                      b) 1                                      c) 2                                      d) None of these
20. If  $3^{x/2} + 2^x > 25$ , then  
 a)  $x \in [4, \infty)$                                       b)  $(4, \infty)$                                       c)  $x \in (-\infty, 4]$                                       d)  $x \in [0, 4]$