

CLASS: XIth DATE:

SUBJECT: MATHS

DPP NO.:2

1.	The number of irration	al solutions of the equat	$x = x^2 + \sqrt{x^2 + 11} + x^2$	$\sqrt{x^2 - \sqrt{x^2 + 11}} = 4, \text{ is}$
	a) ()	h) 2	c) 4	d) 11

2. The number of solutions of the equation $\log_{x-3}(x^3-3x^2-4x+8)=3$, is

a) 1

b)2

3. The number of real solutions of the equation $\log_{0.5} x = |x|$, is

a) 1

b)0

c) 2

d) None of these

4. The number of complex roots of the equation $x^4 - 4x - 1 = 0$, is

a) 3

c) 1

d)0

5. If $\sin^x \alpha + \cos^x \alpha \ge 1, 0 < \alpha < \frac{\pi}{2}$, then

a) $x \in (2, \infty)$

b) $x \in (-\infty,2]$

c) $x \in [-1,1]$

d) None of these

Consider the following statements:

 $1. \frac{x}{1+x^2} < \tan^{-1} x < x; x > 0$

2. If $0 \le x < \frac{\pi}{2}$, $\sin x + \tan x - 3x \ge 0$

Which of these is/are correct?

a) Only (1)

b) Only (2)

c) (1) and (2)

d) None of these

7. The number of solutions of the equation $2\cos(e^x) = 3^x + 3^{-x}$, is

a) 0

b) 1

c) 2

d) None of these

8. The number of real solutions of the equation $1 - x = [\cos x]$, is

a) 1

b) 2

c) 3

d) None of these

9. Non-negative real numbers such that $a_1 + a_2 + ... + a_n = p$ and $q = \sum_{i < j} a_i a_j$, then

a) $q \le \frac{1}{2}p^2$

b) $q > \frac{1}{4}p^2$ c) $q < \frac{p}{2}$

d) $q > \frac{p^2}{2}$

10. If $(\sin a)^x + (\cos a)^x \ge 1$, $0 < a < \frac{\pi}{2}$, then

a) $x \in [2, \infty)$

b) $x \in (-\infty,2]$

c) $x \in [-1, 1]$

d) None of these

- 11. If $x^2 + 2ax + 10 3a > 0$ for all $x \in R$, then
 - a) -5 < a < 2
- b) a < -5
- c) a > 5
- d) 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) $a^2 + b^2 + c^2 \ge bc + ca + ab$
- b) $(b+c)(c+a)(a+b) \le 8abc$

c) $\frac{a}{b} + \frac{b}{c} + \frac{c}{a} \le 3$

- d) $a^3 + b^3 + c^3 \le 3 \ abc$
- 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 internal $[0, 2\pi]$ 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 tri<mark>ngle,</mark> 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,∞)
- c) $x \in (-\infty,4]$
- d) $x \in [0, 4]$