KALAIMAGAL MATRIC HIGHER SECONDARY SCHOOL, MOHANUR.

STD : XI | **MATHEMATICS** | **MARKS: 20**

DATE: | **ONE MARK TEST-1 (BB FULLY)** | **TIME: 15 min**

Choose the correct answer: **20 x 1 = 20**

1. If two sets A and B have 17 elements in common , then the number of elements common to the set $A \times B$ and $B \times A$ is
   1) insufficient data 2) 17^2 3) 34 4) 2^{17}

2. If the function $f : [-3,3] \to S$ defined by $f(x) = x^2$ is onto, then S is
   1) $[-3,3]$ 2) $[0,9]$ 3) $[-9,9]$ 4) R

3. If 3 is the logarithm of 343, then the base is
   1) 9 2) 5 3) 7 4) 6

4. Which of the following is not true?
   1) $\tan\theta = 25$ 2) $\sec\theta = \frac{1}{4}$ 3) $\sin\theta = -\frac{3}{4}$ 4) $\cos\theta = -1$

5. If $\sin\alpha + \cos\alpha = b$, then $\sin 2\alpha$ is equal to
   1) $b^2 - 1$,if $b > \sqrt{2}$ 2) $b^2 - 1$, if $b \le \sqrt{2}$ 3) $b^2 - 1$,if $b \ge \sqrt{2}$ 4) $b^2 - 1$,if $b \ge 1$

6. There are 10 points in a plane and 4 of them are collinear . The number of straight lines joining any two points is
   1) 40 2) 45 3) 38 4) 39

7. The number of rectangles that a chess board has
   1) 9^9 2) 81 3) 6561 4) 1296

8. The value of $1 - \frac{1}{2}\left(\frac{2}{3}\right) + \frac{1}{3}\left(\frac{2}{3}\right)^2 - \frac{1}{4}\left(\frac{2}{3}\right)^3 + \ldots\ldots$ is
   1) $\frac{5}{3}\log\left(\frac{5}{3}\right)$ 2) $\frac{2}{3}\log\left(\frac{2}{3}\right)$ 3) $\log\left(\frac{5}{3}\right)$ 4) $\frac{3}{2}\log\left(\frac{5}{3}\right)$

9. The equation of the line with slope 2 and the length of the perpendicular from the origin equal to $\sqrt{5}$ is
   1) $x - 2y - 5 = 0$ 2) $2x - y = 5$ 3) $2x - y = \sqrt{5}$ 4) $x - 2y = \sqrt{5}$

10. If a vertex of a square is at the origin and its one side lies along the line $4x + 3y - 20 = 0$, then the area of the square is
    1) 25 sq. units 2) 4 sq. units 3) 20 sq. units 4) 16 sq. units

11. If $A = \begin{bmatrix} a & x \\ y & a \end{bmatrix}$ and if $xy = 1$, then $\det(AA^T)$ is equal to
    1) $(a^2-1)^2$ 2) $a^2 - 1$ 3) $(a^2+1)^2$ 4) $(a-1)^2$

12. If $a \neq$ b, b,c satisfy $\begin{vmatrix} a & 2b & 2c \\ 3 & b & c \\ 4 & a & b \end{vmatrix} = 0$, then $a$bc =

1) a+b+ c 2) b^3 3) 0 4) ab+ bc

13. If $\vec{a}, \vec{b}$ are the position vectors A and B, then which of the following points whose position vector lies on AB is

1) $\frac{\overrightarrow{2a} + \vec{b}}{3}$ 2) $\frac{\vec{a} - \vec{b}}{3}$ 3) $\vec{a} + \vec{b}$ 4) $\frac{\vec{a} + \vec{b}}{2}$

14. If $\vec{a}$ and $\vec{b}$ are two vectors of magnitude 2 and inclined at angle 60° , then the angle between $\vec{a}$ and $\vec{a} + \vec{b}$ is

1) 90° 2) 45° 3) 60° 4) 30°

15. $\lim_{x \to 3} \lfloor x \rfloor$ =

1) 0 2) 2 3) does not exist 4) 3

16. If the derivative of (ax– 5) e^{3x} at x = 0 is –13 , then the value of a is

1) 5 2) 2 3) 8 4) –2

17. The derivative of $f(x) = x|x|$ at x = –3 is

1) 0 2) 6 3) does not exist 4) –6

18. $\int \frac{x^2 + \cos^2 x}{x^2 + 1} \operatorname{cosec}^2 x dx$ *is*

1) – tan$x$ + cot^{-1} x +c 2) – cot x + tan^{-1}x +c 3) cot$x$ + sin^{-1}x+c 4) – cot x – tan^{-1}x +c

19. A bag contains 5 white and 3 black balls. Five balls are drawn successively without replacement . The probability that they are alternately of different colours is

1) $\frac{1}{14}$ 2) $\frac{9}{14}$ 3) $\frac{3}{14}$ 4) $\frac{5}{14}$

20. If a and b are chosen randomly from the set { 1,2, 3,4} with replacement , then the probability of the real roots of the equation $x^2 + ax + b = 0$ is

1) $\frac{7}{16}$ 2) $\frac{11}{16}$ 3) $\frac{3}{16}$ 4) $\frac{5}{16}$