# KALAIMAGAL MATRIC HIGHER SECONDARY SCHOOL, MOHANUR.

**STD : XII** | **MATHEMATICS** | **MARKS: 20**

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

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

1. If $(AB)^{-1}=\begin{bmatrix}12 & -17\\ -19 & 27\end{bmatrix}$ and $A^{-1}=\begin{bmatrix}1 & -1\\ -2 & 3\end{bmatrix}$, then $B^{-1}$

   1) $\begin{bmatrix}8 & 5\\ 3 & 2\end{bmatrix}$ 2) $\begin{bmatrix}2 & -5\\ -3 & 8\end{bmatrix}$ 3) $\begin{bmatrix}8 & -5\\ -3 & 2\end{bmatrix}$ 4) $\begin{bmatrix}3 & 1\\ 2 & 1\end{bmatrix}$

2. If $\rho(A)=\rho\left(\left[A|B\right]\right)$, then the system $AX=B$ of linear equation is

   1) Consistent and has a unique solution 2) Inconsistent

   3) Consistent and has infinitely many solution 4) Consistent

3. The solution of the equation $|z|-z=1+2i$ is

   1) $-1$ 2) $-2$ 3) 2 4) 1

4. If $\alpha$ and $\beta$ are the roots of $x^2+x+1=0$, then $\alpha^{2020}+\beta^{2020}$ is

   1) $2-\frac{3}{2}i$ 2) $-\frac{3}{2}+2i$ 3) $\frac{3}{2}-2i$ 4) $2+\frac{3}{2}i$

5. According to the rational root theorem, which number is not possible rational zero of $4x^7+2x^4-10x^3-5$ ?

   1) 5 2) $\frac{4}{5}$ 3) $\frac{5}{4}$ 4) $-1$

6. $\tan^{-1}\left(\frac{1}{4}\right)+\tan^{-1}\left(\frac{2}{9}\right)$ is equal to

   (1) $\frac{1}{2}\tan^{-1}\left(\frac{3}{5}\right)$ (2) $\frac{1}{2}\sin^{-1}\left(\frac{3}{5}\right)$ (3) $\frac{1}{2}\cos^{-1}\left(\frac{3}{5}\right)$ (4) $\tan^{-1}\left(\frac{1}{2}\right)$

7. The area of quadrilateral formed with foci of the hyperbolas $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ and $\frac{x^2}{a^2}-\frac{y^2}{b^2}=-1$ is

   (1) $a^2+b^2$ (2) $2(a^2+b^2)$ (3) $4(a^2+b^2)$ (4) $\frac{1}{2}(a^2+b^2)$

8. If the two tangents drawn from a point $P$ to the parabola $y^2=4x$ are at right angles then the locus of $P$ is

   (1) $2x-1=0$ (2) $x=1$ (3) $2x+1=0$ (4) $x=-1$

9. If $\vec{a},\vec{c},\vec{b}$ are non-coplanar, non-zero vectors such that $[\vec{a},\vec{c},\vec{b}]=3$ than $\{[\vec{a}\times\vec{b},\vec{b}\times\vec{c},\vec{c}\times\vec{a}]\}^2$ is equal to

   1) 18 2) 27 3) 9 4) 81

10. The distance between the planes x+2y+3z=7=0 and 2x+ 4y+6z+7=0 is

1) $\frac{\sqrt{7}}{2\sqrt{2}}$ 2) $\frac{7}{2\sqrt{2}}$ 3) $\frac{\sqrt{7}}{2}$ 4) $\frac{7}{2}$

11. What is the value of the limit $\lim_{x\to 0}\left(\cot x - \frac{1}{x}\right)$ is

(1) 1 (2) 2 (3) 0 (4) $\infty$

12. The point of inflection of the curve $y=(x-1)^3$ is

(1) $(1,0)$ (2) $(0,1)$ (3) $(0,0)$ (4) $(1,1)$

13. If $g(x,y)=3x^2-5y+2y^2, x(t)=e^t$, and $y(t)=\cos t$ then $\frac{dg}{dt}$ is equal to

(1) $3e^{2t}+5\sin t+4\cos t\sin t$ (2) $6e^{2t}-5\sin t+4\cos t\sin t$

(3) $6e^{2t}+5\sin t-4\cos t\sin t$ (4) $3e^{2t}-5\sin t+4\cos t\sin t$

14. The value of $\int_0^{\pi}\frac{dx}{1+5^{\cos x}}$ is

(1) $\frac{3\pi}{2}$ (2) $\pi$ (3) $\frac{\pi}{2}$ (4) $2\pi$

15. If $\int_0^x f(t)dt = x+\int_x^1 t\,f(t)\,dt$, then the value of $f(1)$ is

(1) $\frac{1}{2}$ (2) 1 (3) 2 (4) $\frac{3}{4}$

16. The number of arbitrary constants in the particular solution of a differential equation of third order is

(1) 1 (2) 3 (3) 0 (4) 2

17. The integrating factor of the differential equation $\frac{dy}{dx}+P(x)y=Q(x)$ is $x$, then $P(x)$

(1) $\frac{x^2}{2}$ (2) $x$ (3) $\frac{1}{x^2}$ (4) $\frac{1}{x}$

18. On a multiple-choice exam with 3 possible destructives for each of the 5 questions, the probability that a student will get 4 or more correct answers just by guessing is

(1) $\frac{11}{243}$ (2) $\frac{5}{243}$ (3) $\frac{1}{243}$ (4) $\frac{3}{8}$

19. If a compound statement involves 3 simple statements, then the number of rows in the truth table is

(1) 3 (2) 6 (3) 8 (4) 9

20. Which one of the following is not true?

(1) Negation of a negation of a statement is the statement itself.

(2) If the last column of the truth table contains only $T$ then it is a tautology.

(3) If the last column of its truth table contains only $F$ then it is a contradiction

(4) If $p$ and $q$ are any two statements then $p\leftrightarrow q$ is a tautology.