KALAIMAGAL MATRIC HIGHER SECONDARY SCHOOL, MOHANUR.

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

DATE: | **ONE MARK TEST-2 (BB FULLY)** | **TIME: 15 min**

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

1. If $A^T A^{-1}$ is symemetic, then A^2 =

   1) A^T 2) $\left(A^{-1}\right)^2$ 3) A^{-1} 4) $\left(A^T\right)^2$

2. The rank of matrix $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 6 & 8 \\ -1 & -2 & -3 & -4 \end{bmatrix}$ is

   1) 4 2) 3 3) 2 4) 1

3. If $|z_1|=1, |z_2|=2, |z_3|=3$ and $|9z_1z_2+4z_1z_3+z_2z_3|=12$, then the value of $|z_1+z_2+z_3|$ is

   1) 4 2) 3 3) 2 4) 1

4. The principal argument of the complex number $\frac{\left(1+i\sqrt{3}\right)^2}{4i\left(1-i\sqrt{3}\right)}$ is

   1) $\frac{5\pi}{6}$ 2) $\frac{\pi}{6}$ 3) $\frac{2\pi}{3}$ 4) $\frac{\pi}{2}$

5. The number of positive zeros of the polynomial $\sum_{j=0}^{n} {}^nC_r(-1)^r x^r$ is

   1) $< n$ 2) n 3) 0 4) r

6. $\sin\left(\tan^{-1} x\right), |x|<1$ is equal to

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

7. The radius of the circle passing through the point $(6,2)$ two of whose diameter are $x+y=6$ and $x+2y=4$ is

   (1) 4 (2) $2\sqrt{5}$ (3) 6 (4) 10

8. The eccentricity of the ellipse $(x-3)^2+(y-4)^2=\frac{y^2}{9}$ is

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

9. If $\vec{a}=\hat{\imath}+\hat{\jmath}+\hat{k}$, $\vec{b}=\hat{\imath}+\hat{\jmath}$, $\vec{c}=\hat{\imath}$ and $(\vec{a}\times\vec{b})\times\vec{c}=\lambda\vec{a}+\mu\vec{b}$, then the value of $\lambda+\mu$ is

   1) 3 2) 6 3) 1 4) 0

10. If the direction cosines of a line are $\frac{1}{c}, \frac{1}{c}, \frac{1}{c}$, then

    1) $c=\pm\sqrt{3}$ 2) $c=\pm 3$ 3) $c>0$ 4) $0<c<1$

11. Angle between $y^2 = x$ and $x^2 = y$ at the origin is

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

12. The curve $y = ax^4 + bx^2$ with $ab > 0$

(1) has no points of inflection (2) is concave down

(3) is concave up (4) has no horizontal tangent

13. If $w(x, y) = x^y, x > 0$, then $\frac{\partial w}{\partial x}$ is equal to

(1) $x \log y$ (2) yx^{y-1} (3) $y \log x$ (4) $x^y \log x$

14. The value of $\int_0^1 x(1-x)^{99}dx$ is

(1) $\frac{1}{11000}$ (2) $\frac{1}{10010}$ (3) $\frac{1}{10100}$ (4) $\frac{1}{10001}$

15. The value of $\int_0^a \left(\sqrt{a^2 - x^2}\right)^3 dx$ is

(1) $\frac{3\pi a^2}{8}$ (2) $\frac{3\pi a^4}{16}$ (3) $\frac{\pi a^3}{16}$ (4) $\frac{3\pi a^4}{8}$

16. The integrating factor of the differential equation $\frac{dy}{dx} + y = \frac{1+y}{\lambda}$ is

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

17. The number of arbitrary constants in the general solutions of order n and $n+1$ are respectively

(1) $n-1, n$ (2) $n, n+1$ (3) $n+1, n+2$ (4) $n+1, n$

18. Let X have a Bernoulli distribution with mean 0.4, then the variance of $(2X - 3)$ is

(1) 0.6 (2) 0.96 (3) 0.24 (4) 0.48

19. Which one is the inverse of the statement $(p \vee q) \to (p \wedge q)$?

(1) $\neg(p \vee q) \to (p \wedge q)$ (2) $(\neg p \vee \neg q) \to (\neg p \wedge \neg q)$

(3) $(p \wedge q) \to (p \vee q)$ (4) $(\neg p \wedge \neg q) \to (\neg p \vee \neg q)$

20. The proposition $p \wedge (\neg p \vee q)$ is

(1) a contradiction (2) a tautology

(3) logically equivalent to $p \vee q$ (4) logically equivalent to $p \wedge q$