12TH MATHS MCQS TEST CHAPTER 1 & 2

1) If $|\text{adj}(\text{adj } A)| = |A|^9$, then the order of the square matrix A is

(a) 3 (b) 4 (c) 2 (d) 5

2) If A is a 3×3 non-singular matrix such that $AA^T = A^TA$ and $B = A^{-1}A^T$, then $BB^T =$

(a) A (b) B (c) I_3 (d) B^T

3) If $A = \begin{bmatrix} 3 & 5 \\ 1 & 2 \end{bmatrix}$, B = adj A and C = 3A, then $\frac{|adjB|}{|C|} =$

(a) $\frac{1}{3}$ (b) $\frac{1}{9}$ (c) $\frac{1}{4}$ (d) 1

4) If $A\begin{bmatrix} 1 & -2 \\ 1 & 4 \end{bmatrix} = \begin{bmatrix} 6 & 0 \\ 0 & 6 \end{bmatrix}$, then A =

(a) $\begin{bmatrix} 1 & -2 \\ 1 & 4 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & 2 \\ -1 & 4 \end{bmatrix}$ (c) $\begin{bmatrix} 4 & 2 \\ -1 & 1 \end{bmatrix}$ (d) $\begin{bmatrix} 4 & -1 \\ 2 & 1 \end{bmatrix}$

13) If $A = \begin{bmatrix} \frac{3}{5} & \frac{4}{5} \\ x & \frac{3}{5} \end{bmatrix}$ and $A^T = A^{-1}$, then the value of x is

(a) $\frac{-4}{5}$ (b) $\frac{-3}{5}$ (c) $\frac{3}{5}$ (d) $\frac{4}{5}$

14) If $A = \begin{bmatrix} 1 & \tan\frac{\theta}{2} \\ -\tan\frac{\theta}{2} & 1 \end{bmatrix}$ and $AB = I_2$, then B =

(a) $\left(\cos^2\frac{\theta}{2}\right)A$ (b) $\left(\cos^2\frac{\theta}{2}\right)A^T$ (c) $(\cos^2\theta)I$ (d) $(\text{Sin}^2\frac{\theta}{2})$A

15) If $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ and A(adj A) $= \begin{bmatrix} k & 0 \\ 0 & k \end{bmatrix}$, then k =

(a) 0 (b) sin θ (c) cos θ (d) 1

26) The system of linear equations $x + y + z = 6$, $x + 2y + 3z = 14$ and $2x + 5y + \lambda z = \mu$ ($\lambda, \mu \in R$) is consistent with unique solution if _____

(a) $\lambda = 8$ (b) $\lambda = 8, \mu \neq 36$ (c) $\lambda \neq 8$ (d) none

27) If the system of equations $x = cy + bz$, $y = az + cx$ and $z = bx + ay$ has a non - trivial solution then _____

(a) $a^2 + b^2 + c^2 = 1$ (b) $abc \neq 1$ (c) $a + b + c = 0$ (d) $a^2 + b^2 + c^2 + 2abc = 1$

28) Let A be a 3×3 matrix and B its adjoint matrix If $|B| = 64$, then $|A| =$ _____

(a) ±2 (b) ±4 (c) ±8 (d) ±12

29) If A^T is the transpose of a square matrix A, then _____

(a) $|A| \neq |A^T|$ (b) $|A| = |A^T|$ (c) $|A| + |A^T| = 0$ (d) $|A| = |A^T|$ only

30) The number of solutions of the system of equations 2x+y = 4, x - 2y = 2, 3x + 5y = 6 is _____

(a) 0 (b) 1 (c) 2 (d) infinitely many

7) If $|z - 2 + i| \le 2$, then the greatest value of $|z|$ is

(a) $\sqrt{3}-2$ (b) $\sqrt{3}+2$ (c) $\sqrt{5}-2$ (d) $\sqrt{5}+2$

8) If $\left|z - \frac{3}{z}\right| = 2$, then the least value $|z|$ is

(a) 1 (b) 2 (c) 3 (d) 5

9) If $|z| = 1$, then the value of $\frac{1+z}{1+\bar{z}}$ is

(a) z (b) $\bar{z}$ (c) $\frac{1}{z}$ (d) 1

10) The solution of the equation $|z| - z = 1 + 2i$ is

(a) $\frac{3}{2} - 2i$ (b) $-\frac{3}{2} + 2i$ (c) $2 - \frac{3}{2}i$ (d) $2 + \frac{3}{2}i$

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

(a) $\frac{2\pi}{3}$ (b) $\frac{\pi}{6}$ (c) $\frac{5\pi}{6}$ (d) $\frac{\pi}{2}$

21) If α and β are the roots of $x^2+x+1 = 0$, then $\alpha^{2020} + \beta^{2020}$ is

(a) -2 (b) -1 (c) 1 (d) 2

22) The product of all four values of $\left(cos\frac{\pi}{3} + isin\frac{\pi}{3}\right)^{\frac{3}{4}}$ is

(a) -2 (b) -1 (c) 1 (d) 2

35) If $z = 1-\cos\theta + i\sin\theta$, then $|z|$ = _____

(a) $2\sin\frac{1}{3}$ (b) $2\cos\frac{\theta}{2}$ (c) $2\left|\sin\frac{\theta}{2}\right|$ (d) $2\left|\cos\frac{\theta}{2}\right|$

36) If $z = \frac{1}{1-cos\theta-isin\theta}$, the Re(z) = _____

(a) 0 (b) $\frac{1}{2}$ (c) $\cot\frac{\theta}{2}$ (d) $\frac{1}{2}\cot\frac{\theta}{2}$

37) If $x + iy = \frac{3+5i}{7-6i}$, they y = _____

(a) $\frac{9}{85}$ (b) $-\frac{9}{85}$ (c) $\frac{53}{85}$ (d) none of these

59) If the cube roots of unity are $1, \omega, \omega^2$ then $1 + \omega + \omega^2 =$ _____

(a) 1 (b) 0 (c) -1 (d) ω

60) The complex numbers $\sin x + i\cos 2x$ and $\cos x - i\sin 2x$ are conjugates of each other for _____

(a) $x = k\pi, k \in Z$ (b) $x = 0$ (c) $x = \left(k + \frac{1}{2}\right)\pi, k \in Z$ (d) no value of x