

MATHEMATICS 2024

(Science General Group)

TIME: 3 Hours

(100 Marks)

SECTION 'A' (Multiple Choice Questions)(40)

NOTE: i) This section consists of 20 part questions and all are to be answered. Each part question carries one mark.
ii) Do not copy the part questions in your answer script. Write only the answer in full against the proper number of the question and its part.
iii) All notations are used in their usual meanings. The use of Scientific Calculator is allowed.

1. Choose the correct answer for each from the given options:

i) If $Z = 3i + 4$ then $Z + \bar{Z} =$:

- * 6 * -6 * $8\sqrt{}$ * -8

ii) The product of two conjugate complex numbers is:

- * a real number \checkmark * an imaginary number
* zero * undefined

iii) If A is the singular matrix, then AA^{-1} is:

- * $A^{-1}A$ * I * 0 * undefined \checkmark

iv) A square matrix A is called idempotent matrix if:

- * $A^2 = A$ \checkmark * $A^3 = A$ * $A^2 = I$ * $A^2 = 0$

v) $\begin{vmatrix} 1 & 0 \\ 5 & 6 \end{vmatrix} - \begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix} =$:

- * $-2\sqrt{}$ * 4 * 8 * 10

vi) If $|\vec{a} \times \vec{b}| = |\vec{a} \cdot \vec{b}|$, then the angle between \vec{a} and $\vec{b} =$:

- * 0 * $\frac{\pi}{4}$ * $\frac{\pi}{2}$ * π

vii) This position vector of the point (1, 0, 2) is:

- * $\hat{i} + \hat{j} + 2\hat{k}$ * $\hat{i} + 2\hat{j}$ * $2\hat{i} + 2\hat{k}$ * $\hat{i} + 2\hat{k}$ \checkmark

viii) The A.M's between 4 and 10 is:

- * 4 * 5 * 6 * $7\sqrt{}$

ix) A sequence is a function whose domain is a set of:

- * integers * rational numbers
* real numbers * natural numbers \checkmark

x) $\sum_{1}^{50} n =$:

- * 1274 * $1275\sqrt{}$ * 1280 * 1285

xi) Probability of getting 7 in throwing a dice is:

- * $0\sqrt{}$ * 1 * -1 * undefined

xii) The sum of the expansion of $(a + b)^{2n}$ is:

- * n * $n + 1\sqrt{}$ * $2n + 1$ * 2n

xiii) If $n = 0$, then $(n + 1)! =$:

- * 0 * n * $1\sqrt{}$ * ∞

xiv) If $f(x, y) = 5x + 4y$ is an objective function and the corner points of the feasible region are (5, 4), (0, 0), (0, 6) and (4, 0) then the function is maximum at:

- * (4, 0) * (0, 6) * (0, 0) * (5, 4) \checkmark

xv) The region of solution in L.P. problem is called:

- * Infeasible region * Unbounded region
* Infinite region * feasible region \checkmark

xvi) $1 + \cos\theta =$:

- * $2\sin^2\frac{\theta}{2}$ * $\sin^2\frac{\theta}{2}$ * $2\cos^2\frac{\theta}{2}$ \checkmark * $\cos^2\frac{\theta}{2}$

xvii) $c^2 \frac{\sin\beta\sin\alpha}{\sin\gamma} =$:

- * Δ * Δ^2 * $\frac{1}{2}\Delta$ * $2\Delta\sqrt{}$

xviii) $\sin\frac{\alpha}{2}$ is equal to:

- * $\pm\sqrt{\frac{1+\sin\alpha}{2}}$ * $\pm\sqrt{\frac{1-\cos\alpha}{2}}$ \checkmark * $\pm\sqrt{\frac{1+\cos\alpha}{2}}$ * $\pm\sqrt{\frac{1-\sin\alpha}{2}}$

xix) Period of $\cos x$ is:

- * $\frac{\pi}{2}$ * π * $2\pi\sqrt{}$ * 3π

xx) $\cos\left(\sin^{-1}\frac{1}{\sqrt{2}}\right) =$:

- * $\frac{1}{\sqrt{2}}\sqrt{}$ * $-\frac{1}{\sqrt{2}}$ * $\frac{\sqrt{3}}{2}$ * $-\frac{1}{2}$