

Time Allowed: 3 Hrs
Note: There are **Three Sections** in this paper i.e. A, B and C. Attempt Section-A and return it to the Superintendent within the given time.
No marks will be awarded for **Cutting, Erasing and Overwriting**.
Mobile Phone is strictly prohibited in Examination Hall.

Time: 20 Minutes SECTION "A" Marks: 20

Q.1. Choose the correct option and shade one of (A, B, C, D) in the given Bubble Answer Sheet.

- i. The modulus of the complex number $-8 + 15i$ is:
(A) $\sqrt{23}$ (B) 23 (C) 17 (D) 15
- ii. A square matrix $A = [a_{ij}]$ is called a diagonal matrix if $a_{ij} = 0$ for all:
(A) $i = j$ (B) $i \neq j$ (C) $i < j$ (D) $i > j$
- iii. The Cofactor of the element a_{31} of the matrix $A = \begin{bmatrix} 1 & 6 & 7 \\ 2 & 5 & 8 \\ 3 & 4 & 9 \end{bmatrix}$ is:
(A) -2 (B) 2 (C) -13 (D) 13
- iv. The determinant of the matrix $\begin{bmatrix} 1 & 0 & 1 \\ 5 & 0 & 6 \\ 1 & 0 & 2 \end{bmatrix}$ is:
(A) -5 (B) 0 (C) 5 (D) 10
- v. The unit vector in the direction of the vector $7i + 24j$ is:
(A) $\frac{7}{31}i - \frac{14}{31}j$ (B) $\frac{7}{31}i + \frac{14}{31}j$ (C) $\frac{7}{25}i + \frac{14}{25}j$ (D) $\frac{7}{25}i - \frac{14}{25}j$
- vi. The magnitude of the vectors $a = 4i + 7j + 4k$ is:
(A) $\sqrt{11}$ (B) 9 (C) $\sqrt{15}$ (D) 15
- vii. The Arithmetic Mean of -11 & 27 is:
(A) 8 (B) 12 (C) 14 (D) 16
- viii. The sum of the cubes of the first 12 natural number is:
(A) 5024 (B) 5084 (C) 6084 (D) 6096
- ix. The number of different arrangements of the letters of the word "WRITE" is:
(A) 5 (B) 20 (C) 60 (D) 120
- x. The number of ways a committee of 4 members can be formed from a group of 9 people:
(A) 115 (B) 120 (C) 126 (D) 130
- xi. The sum of the series $(6+7+8+\dots+55)$ is:
(A) 1305 (B) 1315 (C) 1405 (D) 1470
- xii. The fifth coefficient in the row of Pascal's Triangle for $(x + y)^7$ is:
(A) 7 (B) 21 (C) 35 (D) 40
- xiii. The Domain of the function $f(x) = \sqrt{49 - x^2}$ is:
(A) $-7 \leq x \leq 7$ (B) $x \leq 7$ (C) $x \geq -7$ (D) All real numbers
- xiv. The graph of the function $f(x) = \frac{3}{x^{11}} + 5$ is symmetric about:
(A) X - axis (B) Y - axis (C) Origin (D) Z - axis
- xv. The corner points for the region bounded by $x - y \leq 2$, $x + y \geq 4$ & $y \leq 3$ are:
(A) $(0,5), (3,5), (0,8)$ (B) $(0,6), (2,4), (2,0)$ (C) $(1,3), (5,3), (3,1)$ (D) $(6,2), (4,4), (8,0)$
- xvi. The value of $\tan(\frac{3\pi}{2} + \alpha) =$
(A) $\cot\frac{\pi}{2}$ (B) $\text{Cot}\alpha$ (C) $- \tan\alpha$ (D) $- \text{Cot}\alpha$
- xvii. When θ lies in the 2nd quadrant then $\sin\frac{\theta}{2}$ is equal to:
(A) $\sqrt{\frac{1 - \cos\theta}{2}}$ (B) $-\sqrt{\frac{1 - \cos\theta}{2}}$ (C) $\sqrt{\frac{1 + \cos\theta}{2}}$ (D) $-\sqrt{\frac{1 + \cos\theta}{2}}$
- xviii. The law used for solving an oblique triangle, when S.S.S is given, is:
(A) Law of Sines (B) Law of Cosines (C) Law of Tangent (D) Law of Cotangent
- xix. The minimum value of the function $y = 5 - 3\sin\theta$ is:
(A) 2 (B) -2 (C) 3 (D) -3
- xx. The graph of the function $y = \sec x$ repeats every:
(A) 90° (B) 180° (C) 270° (D) 360°