Roll No. | | | | | | |

Answer Sheet No._____

Sig. of Candidate._____

Sig. of Invigilator._____



# MATHEMATICS SSC–I

## SECTION – A (Marks 15)

**Time allowed: 20 Minutes**

**NOTE:- Section–A is compulsory. All parts of this section are to be answered on the question paper itself. It should be completed in the first 20 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.**

**Q. 1 Circle the correct option i.e. A/B/C/D. Each part carries one mark.**

(i) $\{---,-2,\ -1,\ 0,\ 1,\ 2,-----\}$ can be written _____ in set builder notation.

A. $\{x : x \in R\}$ B. $\{x : x \in w\}$ C. $\{x \mid x \in z\}$ D. $\{x \mid x \in z \wedge -2 < x < 2\}$

(ii) The Range of $R = \{(1,\ 0), (2,\ 1), (4,\ 3)\}$ is _____.

A. $\{2,\ 3,\ 4\}$ B. $\{0,\ 1,\ 3\}$ C. $\{1,\ 2,\ 3\}$ D. $\{1,\ 2,\ 4\}$

(iii) On $x-$axis, the $y-$coordinate of every point is _____.

A. Zero B. One C. Two D. None of these

(iv) The multiplicative inverse of $\frac{-\sqrt{7}}{2}$ is _____.

A. $\frac{-\sqrt{7}}{2}$ B. $\frac{\sqrt{7}}{2}$ C. $\frac{-2}{\sqrt{7}}$ D. $\frac{2}{\sqrt{7}}$

(v) $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}\begin{bmatrix}1 & 3\\ 2 & 2\end{bmatrix} =$ _____.

A. $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ B. $\begin{bmatrix}1 & 3\\ 2 & 2\end{bmatrix}$ C. $\begin{bmatrix}1 & 3\\ 0 & 2\end{bmatrix}$ D. $\begin{bmatrix}1 & 0\\ 2 & 1\end{bmatrix}$

(vi) If $AA^{-1} = I$, then $A^{-1}$ is the _____ of matrix $A$.

A. Multiplicative Inverse B. Additive Inverse
C. Adjoint D. Additive Identity

(vii) Sum of the measures of the interior angles of a triangle is _____.

A. $90^{\circ}$ B. $105^{\circ}$ C. $180^{\circ}$ D. $360^{\circ}$

(viii) The diagonals of a parallelogram _____ each other.

A. Congruent B. Bisect C. Trisect D. Bisect at right angles

(ix) The lines which bisect the sides of a triangle perpendicularly are called _____

A. Medians B. Altitudes
C. Perpendicular bisectors D. Bisectors of segments

(x) $\left(4^3\right)^2 =$ _____.

A. $4^8$ B. $4^9$ C. $4^6$ D. 4

(xi) The base of the common logarithm is _____.

A. 10 B. 1 C. $e$ D. 2

(xii) $4x^3y^2 + 3$ is a polynomial of degree _____.

A. 3 B. 2 C. 4 D. 5

(xiii) $(2a+3b)\left(4a^2 - 6ab + 9b^2\right) =$ _____.

A. $8a^3 - 27b^3$ B. $8a^3 + 27b^3$ C. $4a^2 + 9b^2$ D. $4a^2 - 9b^2$

(xiv) Right bisector of a line-segment is _____.

A. Not unique B. Congruent to side
C. $\frac{1}{2}$ of the side D. Unique

(xv) $CUC^c =$ _____.

A. $C$ B. $C^c$ C. $\{\}$ D. $U$

**For Examiner's use only:**

**Total Marks:** 15

**Marks Obtained:**

# MATHEMATICS SSC–I



**Time allowed: 2:40 Hours** **Total Marks Sections B and C: 60**

NOTE:- **Answer any twelve parts from Section 'B' and attempt any three questions from Section 'C' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet–B if required. Write your answers neatly and legibly.**

## SECTION – B (Marks 36)

Q. 2 **Attempt any TWELVE parts. All parts carry equal marks. ( 12 x 3 = 36 )**

(i) If $P=\{x \mid x \in Z \wedge -3 < x < 1\}$ and $R=\{x \mid x \in W \wedge 5 \le x \le 7\}$ then find $R \times P$

(ii) If $A=\{1, 2, 3, 5, 7\}$, $B=\{2, 4, 6\}$ and $C=\{2, 5, 9\}$ then show that $(A \cup B) \cup C = A \cup (B \cup C)$

(iii) If $\frac{1}{x}=2+\sqrt{3}$ find the value of $x^2-\frac{1}{x^2}$

(iv) Simplify $\frac{4^{3m+3n+2} \times 10^{2n} \times 9^{n+1}}{15^{2n+2} \times 2^{2n} \times 8^{2m+2n+1}}$

(v) Evaluate $\frac{2.38 \times 3.901}{4.83}$ with the help of logarithms.

(vi) For what value of $m$ is $x-5$ a factor of the polynomial $6x^3-5x^2-16x+m$

(vii) Use formula to find the product $(\sqrt{x}+\sqrt{y})(\sqrt{x}-\sqrt{y})(x+y)$

(viii) If $P(y)=\frac{1}{2y^3}+2y^2-1$ find $P(-2)$

(ix) Factorize $x^4-2x^3+2x-1$

(x) Factorize $1-64\frac{p^3}{q^3}$

(xi) Find the L.C.M. of $(a^3+1), (a^4+a^2+1)$ and $(a^2+a+1)^2$

(xii) Simplify $\frac{a+b}{a^2+ab+b^2}+\frac{1}{a-b}-\frac{ab}{a^3-b^3}$

(xiii) Find the solution set of $2x-5y=1$ and $3x+4y=36$ by using Crammer's rule.

(xiv) If $A=\begin{bmatrix}2 & 0\\ 1 & 5\end{bmatrix}$ and $B=\begin{bmatrix}1 & 0\\ 2 & k\end{bmatrix}$ then find the value of $k$ such that $AB=BA$

(xv) Find the square root of $\left(x^2+\frac{1}{x^2}\right)+10\left(x+\frac{1}{x}\right)+27$, $x \neq 0$

(xvi) Write $\log\frac{\sqrt{24.42}}{\sqrt[3]{222.2}}$ in the form of sum or difference of logarithms.

(xvii) Find the H.C.F. of $x^3+6x^2+11x+6$ and $x^3+9x^2+27x+27$ by division method.

(xviii) Factorize $27l^3-8m^3-72lm-64$

## SECTION – C (Marks 24)

Note:- **Attempt any THREE questions. All questions carry equal marks.** **( 3 x 8 = 24 )**

Q. 3 If two angles of a triangle are congruent, then the sides opposite to them are also congruent. Prove.

Q. 4 The line segment that joins the mid-points of two sides of a triangle is parallel to the third side and is equal to one half of it length. Prove.

Q. 5 Prove that if in any correspondence of two triangles, two angles and one side of a triangle are congruent to the corresponding two angles and one side of the other, the triangles are congruent.

Q. 6 Draw medians of $\Delta XYZ$ in which $m\angle Y = 45^\circ$, $m\angle X = 60^\circ$ and $XY = 6.3\,cm$