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) In an ordered pair (a,b), a is called _____

A. Co-ordinate B. Ordinate C. Abscissa D. Quadrant

(ii) Point $(1,-2)$ lies in the _____ quadrant.

A. I B. II C. III D. IV

(iii) $\frac{-\sqrt{5}}{2} \times 1 = \frac{-\sqrt{5}}{2}$ shows _____ property.

A. Additive Inverse B. Multiplicative Inverse

C. Additive Identity D. Multiplicative Identity

(iv) $4 \times 5^0 =$ _____

A. 4 B. 5 C. 1 D. 20

(v) The standard form of 8.24×10^{-4} is _____

A. 0.00824 B. 0.0824 C. 0.000824 D. 0.824

(vi) The characteristic of $\log 19$ is _____

A. 0 B. 10 C. 2 D. 1

(vii) $a^3 - b^3 = (a-b)$ (_____)

A. $a^2 + ab - b^2$ B. $a^2 - ab - b^2$ C. $a^2 + ab + b^2$ D. $a^2 - ab + b^2$

(viii) If $x+1$ is a factor of $x^2 + 3x + m$, then m=_____

A. –1 B. –2 C. 2 D. 1

(ix) The order of matrix $\begin{bmatrix} 3 & 2 \end{bmatrix}$ is _____

A. 2x1 B. 2x2 C. 1x2 D. 1x1

(x) If matrix $\begin{bmatrix} 2 & 3 \\ 4 & x \end{bmatrix}$ is singular, then x= _____

A. 3 B. 6 C. 4 D. 0

(xi) If $a=b$, $b=c$, then $a=c$ is called _____

A. Postulate B. Axiom C. Given D. To prove

(xii) A triangle is said to be a/an _____ triangle if its three sides are of equal length.

A. Isosceles B. Equilateral C. Obtuse D. Acute

(xiii) From two points _____ line(s) can be drawn.

A. Two B. Three C. One D. Infinite

(xiv) There are _____ acute angle(s) in an acute triangle.

A. One B. Two C. Three D. Four

(xv) AB stands for _____

A. $\overline{AB}$ B. $\overrightarrow{AB}$ C. $\overleftrightarrow{AB}$ D. $m\overline{AB}$

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:- Attempt any twelve parts from Section 'B' and 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) Find the values of x and y, if $(x-1, y+2)=(2x+4, -4)$

(ii) If $U = \{1,2,3,4.....,10\}$, $A = \{2,4,6,8,10\}$ and $B = \{2,3,5,7\}$ then find $(A \cap B)^C$

(iii) If $x=\sqrt{2}-1$ then find the value of $x^4+\frac{1}{x^4}$

(iv) Simplify $\left(\frac{x^m}{x^n}\right)^{m+n-l} \cdot \left(\frac{x^n}{x^l}\right)^{n+l-m} \cdot \left(\frac{x^l}{x^m}\right)^{l+m-n}$, $x \neq 0$

(v) Convert the wavelength $4.5x10^5 cm$ of blue light into metres and write in standard form.

(vi) If log 2= 0.3010, log 3= 0.4771, log 5= 0.6990, then find the value of $\log\sqrt{18}$

(vii) Evaluate with the help of logarithm $2391 \div 3072$

(viii) Find the value of $a^3+b^3+c^3-3abc$ when $a^2+b^2+c^2 = 26$; $ab + bc + ac = 5$

(ix) Prove that $\left(x+\frac{1}{x}\right)^2-\left(x-\frac{1}{x}\right)^2=4$

(x) Find L.C.M by factorization a^3+b^3 , a^4-b^4 , a^6+b^6

(xi) One algebraic expression is x^3-x^2+2x-2 and the other is $x^3 - x^2 - 2x + 2$. If their H.C.F is x-1, then find their L.C.M.

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

(xiii) Find square root of $\left[a-\frac{1}{a}\right]^2 - 4\left[a+\frac{1}{a}\right] + 8$ where $a \neq 0$

(xiv) If $A = \begin{bmatrix} -1 & 2 \\ -3 & 4 \end{bmatrix}$; $B = \begin{bmatrix} 3 & -2 \\ -1 & 4 \end{bmatrix}$ then find AB.

(xv) If $A = \begin{bmatrix} 7 & 1 \\ -3 & 2 \end{bmatrix}$ then find A^{-1}. Also prove that $A^{-1}A=I$

(xvi) Solve by Cramer's rule $3x - 6y - 2 = 0$; $x + 5y = -5$

(xvii) Simplify $\frac{2^{\frac{1}{3}}.(27)^{\frac{1}{3}}.(60)^{\frac{1}{2}}}{(180)^{\frac{1}{2}}.(4)^{\frac{-1}{3}}.(9)^{\frac{1}{4}}}$

(xviii) Construct ΔABC in which $m\angle A = 75^O$, $m\angle B = 30^O$ and $AB = 4.5cm$

SECTION – C (Marks 24)

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

Q. 3 Prove that if two lines intersect each other, then the vertical angles are congruent.

Q. 4 Prove that if in a given correspondence of two triangles, the three sides of one triangle are congruent to the corresponding three sides of the other triangle, then the triangles are congruent $(S.S.S \cong S.S.S)$.

Q. 5 Prove that a quadrilateral having two opposite sides parallel and congruent is a parallelogram.

Q. 6 Draw angle bisectors of ΔPQR in which $PR = 5.3cm$, $m\angle P = 30^O$ and $m\angle R = 60^O$

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) If (x–2, 1) = (–3 , 1) then the value of x is _____

A. –5 B. 1 C. 5 D. –1

(ii) $x, y, z \in R$ and x=y and $y=z \Rightarrow x=z$ is _____ Property.

A. Reflexive B. Symmetric C. Transitive D. Additive

(iii) If $x=\sqrt{3}+2$, then $x+\frac{1}{x}=$ _____

A. $2\sqrt{3}$ B. 4 C. $-2\sqrt{3}$ D. None of these

(iv) The speed of light is _____ cm per second.

A. $3x10^8$ B. $3x10^6$ C. $3x10^{10}$ D. $3x10^4$

(v) The standard form of $2.35x10^{-2}$ is _____

A. 500 B. 0.0235 C. 700 D. 1000

(vi) If x+y=2 and xy=3 then the value of $x^2+y^2=$ _____

A. 4 B. –2 C. –4 D. 2

(vii) For what value of m, x^2+4x+m will be a complete square?

A. 8 B. – 8 C. 4 D. – 4

(viii) $\begin{bmatrix}3\\1\end{bmatrix}[1\ \ 2] =$ _____

A. $\begin{bmatrix}2 & 3\\4 & 0\end{bmatrix}$ B. $\begin{bmatrix}3 & 6\\1 & 2\end{bmatrix}$ C. $\begin{bmatrix}4 & 2\\6 & 3\end{bmatrix}$ D. None of these

(ix) $\begin{bmatrix}2 & 0\\0 & 2\end{bmatrix}$ is a _____ matrix.

A. Singular B. Zero C. Scalar D. Unit

(x) The factorization of x^2-5x+6 is _____

A. (x–2)(x+3) B. (x–3)(x+2) C. (x–2)(x–3) D. None of these

(xi) In an isosceles triangle _____ side(s) is/are congruent.

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

(xii) The line segment joining a vertex of the triangle to the midpoint of the side opposite to that vertex is called _____ of the triangle.

A. Angle B. Altitude C. Median D. Base

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

A. Bisect B. Bisect at right angle

C. Are congruent to D. None of these

(xiv) In any triangle there can be _____ right angle(s).

A. One B. Two C. Three D. Four

(xv) The angles of measures 50^O and 130^O are called _____ angles.

A. Complementary B. Supplementary C. Adjacent D. Obtuse

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:- Attempt any twelve parts from Section 'B' and 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 $A=\{-2,0,2\}$ and $B=\{-1,0,-2\}$ then write a binary relations for R in Ax B, when $R=\{(x,y)/x\in A\wedge y\in B\wedge y\leq x\}$

(ii) If $U=\{x/x\in Z\wedge 1\leq x\leq 10\}$, $A=\{2,4,6,8,10\}$, $B=\{2,3,5,7\}$ then find $(AUB)^C$

(iii) Simplify $\sqrt[3]{\frac{64\,a^3b^6}{216\,c^6d^9}}$

(iv) If $a=\sqrt{3}-\sqrt{2}$, then evaluate $a-\frac{1}{a}$ and $a^4+\frac{1}{a^4}$

(v) Simplify $\left(\frac{x^{2m}}{x^{m-n}}\right)^{m-n}\times\left(\frac{x^{2n}}{x^{n-l}}\right)^{n-l}\times\left(\frac{x^{2l}}{x^{l-m}}\right)^{l-m}$, $x\neq 0$

(vi) If log 2= 0.3010, log 3= 0.4771, log 5= 0.6990, then find the value of log $\frac{8}{3}$

(vii) Evaluate with the help of logarithm $\sqrt[3]{4.872}$

(viii) If a=1, b=1, c=3, then find the value of $3a^2+\frac{1}{2}b^3+\frac{1}{3}c^3-16$

(ix) If x–5 is a factor of polynomial $6x^3-5x^2-16x+m$, then find the value of 'm' by Remainder theorem.

(x) Find the value of a^2+b^2 and ab when a+b = 5 and a – b = 3

(xi) Factorize $2x^5y-32xy^5$

(xii) Factorize $a^4-2a^3b+2ab^3-b^4$

(xiii) Find H.F.C by factorization $l^2-m^2, l^4-m^4, l^6-m^6$

(xiv) Prove that $H^3+L^3=A^3+B^3$ where H+L = A+B. In it H and L stand for H.C.F and L.C.M, respectively, and A,B represent two polynomials.

(xv) Simplify $\frac{a^2+5a-14}{a^2-3a-18}\times\frac{a+3}{a-2}$

(xvi) If $\begin{bmatrix}1 & 5\\ 3 & p\end{bmatrix}\begin{bmatrix}q\\ 7\end{bmatrix}=\begin{bmatrix}35\\ 10\end{bmatrix}$, then find the values of p and q.

(xvii) Find the value of 'a' when $A=\begin{bmatrix}2a & -4\\ -1 & 5\end{bmatrix}$ and $|A|=16$

(xviii) Use matrices to solve the linear equations: $3x=3-4y$; $2y=x+\frac{2}{3}$

SECTION – C (Marks 24)

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

Q. 3 Prove that an exterior angle of a triangle is greater in measure than either of its opposite interior angles.

Q. 4 Prove that the sum of the measures of the three angles of a triangle is 180^O.

Q. 5 Prove that any point equidistant from the end points of a line segment is on the right bisector of it.

Q. 6 Draw right bisectors of the sides of ΔABC in which $m\angle A=75^O$, $m\angle B=30^O$ and $AB=5cm$