

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. Abscissa B. Ordinate C. Quadrant D. Plane
- (ii) What will be the value of x , if $(x-2, 1) = (-5, -1)$ _____.
- A. 3 B. -3 C. 1 D. None of these
- (iii) If $\forall x, y, z \in R$ $x = y$ and $y = z \Rightarrow x = z$, then it is called _____ property.
- A. Reflexive B. Symmetric C. Transitive D. Trichotomy
- (iv) The speed of light is $3 \times 10^{10} \text{ cms}^{-1}$. Its speed in ms^{-1} is _____.
- A. 3×10^5 B. 3×10^{10} C. 3×10^8 D. 3×10^6
- (v) In 1620 AD _____ developed an antilogarithm table.
- A. Jobst Burgi B. Al-Khawarizmi C. Henry Briggs D. John Napier
- (vi) If $x = 4 - \sqrt{17}$, then $\frac{1}{x} =$ _____.
- A. $-4 + \sqrt{17}$ B. $4 + \sqrt{17}$ C. $-4 - \sqrt{17}$ D. $4 - \sqrt{17}$
- (vii) $2x^3 + 5y^2 + \frac{1}{2x}$ is a _____.
- A. Monomial B. Binomial C. Trinomial D. Non-Polynomial
- (viii) $a^3 - b^3 = (a-b)(\text{_____})$
- A. $a^2 - ab + b^2$ B. $a^2 + ab + b^2$ C. $a + b$ D. $a - b$
- (ix) If $A = \begin{bmatrix} 1 & 2 \\ -2 & 4 \end{bmatrix}$, then its transpose is _____.
- A. $\begin{bmatrix} -1 & -2 \\ 2 & -4 \end{bmatrix}$ B. $\begin{bmatrix} 1 & -2 \\ 2 & 4 \end{bmatrix}$ C. $\begin{bmatrix} -4 & 2 \\ -2 & 1 \end{bmatrix}$ D. $\begin{bmatrix} 4 & 2 \\ -2 & 1 \end{bmatrix}$
- (x) If matrix $\begin{bmatrix} 3 & 2 \\ x & 4 \end{bmatrix}$ is singular, then $x =$ _____.
- A. 3 B. 6 C. 4 D. None of these
- (xi) _____ were the pioneers of geometry.
- A. Greeks B. Muslims C. Egyptians D. Europeans
- (xii) There can pass _____ through one point.
- A. Two lines B. Three lines C. Infinite number of lines D. One line
- (xiii) The medians of a triangle intersect each other in the ratio _____.
- A. 1:3 B. 1:2 C. 1:1 D. 3:2
- (xiv) Construction of triangle is possible when sides in cm are _____.
- A. 5, 5, 11 B. 10, 3, 6 C. 5, 5, 5 D. 2, 3, 6
- (xv) If two medians of a triangle are congruent, then the triangle will be _____ triangle.
- A. Equilateral B. Isosceles C. Scalene D. Right-angled

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) Write the power set of $\{+, -, \times, \div\}$
- (ii) Draw the Venn Diagrams in general when A and B are:
 - a. Disjoint sets
 - b. Overlapping sets
 - c. B is a subset of A
- (iii) Simplify $\frac{2^5 \cdot 3^7 \cdot 4^3 \cdot 5^4}{8^2 \cdot 9^2 \cdot 6^2 \cdot 25^2}$
- (iv) If $\log 2 = 0.3010$, $\log 3 = 0.4771$ and $\log 5 = 0.6990$, then find the value of $\log 30$ without using log table and calculator.
- (v) Find the value of x from $\log_{64} x = \frac{-2}{3}$
- (vi) Simplify $\left(\frac{18 l^2 m^6 n^9}{6 l m^4 n^4}\right)^3$
- (vii) For what value of p the polynomial $3x^3 - 7x^2 - 9x + p$ becomes exactly divisible by $x - 3$.
- (viii) Find the value of $x + y$ when $x - y = 5$ and $xy = 24$
- (ix) Find the value of $x^3 + y^3 + z^3 - 3xyz$ if $x^2 + y^2 + z^2 = 77$, $x + y + z = 15$
- (x) Factorize $m^6 - n^6$
- (xi) Find H.C.F. of $15x^4 - 23x^2 + 4$ and $10x^4 - 12x^2 + 2$ by division method.
- (xii) Find the value of a when $A = \begin{bmatrix} 2a & -4 \\ -1 & 5 \end{bmatrix}$ and $|A| = 16$
- (xiii) Use Cramer's rule to solve the following equations:

$$0.8x - 0.6y = 1$$

$$0.6x + 0.8y = 2$$
- (xiv) Simplify $\frac{x^4 - y^4}{x^2 - 2xy + y^2} \times \frac{x - y}{x(x + y)} \div \frac{x^2 + y^2}{x}$
- (xv) Find the square root of $4x^4 + 12x^3 + 25x^2 + 24x + 16$
- (xvi) If $U = \{1, 2, 3, 4, \dots, 10\}$, $A = \{2, 4, 6\}$ and $B = \{1, 2, 3, 4, 5, 6, 7\}$, then show that $(A \cup B)^c = A^c \cap B^c$
- (xvii) If $x = 4 - \sqrt{15}$, then find the values of:
 - a. $\frac{1}{x}$
 - b. $x + \frac{1}{x}$
 - c. $x - \frac{1}{x}$
- (xviii) Evaluate $\frac{2.38 \times 3.901}{4.83}$ with the help of logarithms.

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 if two angles of a triangle are congruent, then the sides opposite to them are also congruent.
- Q. 5 Prove that if three or more parallel lines make segments congruent on one transversal, they also make congruent segments on any other transversal.
- Q. 6 Draw the angle bisectors of $\triangle ABC$ in which $\overline{AB} = 6 \text{ cm}$, $\overline{BC} = 6 \text{ cm}$ and $m\angle A = 60^\circ$
(Also write steps of construction).

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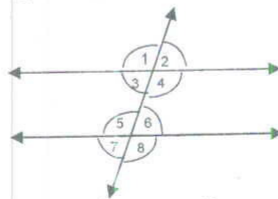
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MATHEMATICS SSC-I
SECTION - A (Marks 15)

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) $A \cap \phi^c =$ _____
A. U B. ϕ C. A D. A'
- (ii) $\{(x+y)^0\}^5 =$ _____
A. $x+y$ B. 5 C. 0 D. 1
- (iii) The standard form of 2.35×10^{-2} is _____
A. 235 B. 23.5 C. 0.235 D. 0.0235
- (iv) The degree of polynomial $6x^4 + y^3 + 3x^7y + xy^2$ is _____
A. 4 B. 5 C. 8 D. 3
- (v) _____ will be added to complete the square of $x^2 + 4xy$.
A. $4x^2$ B. $2y^2$ C. $4y^2$ D. None of these
- (vi) H.C.F. of $(a+b)^3$ and $a^2 + 2ab + b^2$ is _____
A. $a+b$ B. $(a+b)^2$ C. $(a+b)^3$ D. 1
- (vii) What will be the factorization of $1 + 4ab - 4a^2 - b^2$?
A. $(1-2a+b)(1+2a+b)$ B. $(1+2a+b)(1-2a+b)$
C. $(1-2a+b)(1+2a-b)$ D. $(1-2a-b)(1-2a+b)$
- (viii) The idea of matrices was introduced by _____ in 1857.
A. Arther Kally B. Cramer C. Al-Khwarizmi D. Henry Briggs
- (ix) There can be _____ obtuse angle(s) in a triangle.
A. 1 B. 2 C. 3 D. None of these
- (x) If in a quadrilateral two sides are parallel and two sides are non-parallel then it is called a _____.
A. Square B. Rectangle C. Trapezium D. Parallelogram
- (xi) If a transversal cuts two parallel lines, the pairs of corresponding angles so formed are _____ in number.
A. 1 B. 2 C. 3 D. 4
- (xii) Three medians of a triangle are _____ at a point lying within the triangle.
A. Equal B. Congruent C. Concurrent D. None of these
- (xiii) Set of even numbers and set of odd numbers are _____ sets.
A. Overlapping B. Disjoint C. Equal D. None of these
- (xiv) $x + \frac{1}{x}$ is a _____.
A. Polynomial B. Binomial C. Trinomial D. Non-Polynomial
- (xv)

In the above figure if $m\angle 1 = 110^\circ$ then $m\angle 6 =$ _____
A. 90° B. 110° C. 100° D. 70°

For Examiner's use only:

Total Marks:

15

Marks Obtained:

— 1SA 1209 (ON) —



MATHEMATICS SSC-I

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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 $A = \{2, 3, 4, 5\}$, $B = \{3, 5, 11, 15\}$ then find $A - B$, $B - A$ and $A \cap B$
- (ii) If $A = \{1, 2, 3\}$, $B = \{-4, -3, -2, -1\}$ then find $A \times B$, $B \times A$ and $A \times A$
- (iii) Factorize $x^4 + 64y^4$
- (iv) Simplify $\sqrt[3]{\frac{64a^3b^6}{216c^6d^9}}$
- (v) Simplify $\frac{\sqrt{a+2} - \sqrt{a-2}}{\sqrt{a+2} + \sqrt{a-2}}$
- (vi) Find the value of x from $\log_{64} 8 = \frac{x}{2}$
- (vii) If $P(y) = \frac{1}{2y^3} + 2y^2 - 1$ then find $P(-2)$
- (viii) Simplify $\frac{4^{3m+3n+2} \times 10^{2n} \times 9^{n+1}}{15^{2n+2} \times 2^{2n} \times 8^{2m+2n+1}}$
- (ix) Evaluate with the help of logarithms $\frac{(8.97)^2 \times (1.059)^3}{57.7}$
- (x) Find the value of $8xy(x^2 + y^2)$ when $x + y = 6$ and $x - y = 4$
- (xi) Use formula to find the product of $(\sqrt{x} + \sqrt{y})(\sqrt{x} - \sqrt{y})(x + y)$
- (xii) Factorize $a^4 - 2a^3b + 2ab^3 - b^4$
- (xiii) Find the value of $a^3 + b^3 + c^3 - 3abc$ when $a + b + c = 7$, $ab + bc + ca = 12$
- (xiv) Find L.C.M of $a^3 + 64$ and $a^2 - 16$
- (xv) If $A = x^2 - 5x - 14$, $H = x - 7$, $L = x^3 - 10x^2 + 11x + 70$ then find B .
- (xvi) Simplify $\frac{a^3 - b^3}{a^4 - b^4} \div \frac{a^2 + ab + b^2}{a^2 + b^2}$
- (xvii) If $\begin{bmatrix} 1 & 5 \\ 3 & p \end{bmatrix} \begin{bmatrix} q \\ 7 \end{bmatrix} = \begin{bmatrix} 35 \\ 10 \end{bmatrix}$, then find the value of p and q .
- (xviii) Use matrices to solve:
 $2x - 5y = 1$
 $3x + 4y = 36$

(Do not use Cramer's Rule)

SECTION - C (Marks 24)

Note: Attempt any THREE questions. All questions carry equal marks.

(3 x 8 = 24)

- Q. 3 Prove that if a transversal intersects two coplanar lines such that the pair of alternate angles are congruent, then the lines are parallel.
- Q. 4 Prove that the sum of the measures of three angles of a triangle is 180° .
- Q. 5 Prove that any point on the right bisector of a line segment is equidistant from its end points.
- Q. 6 Draw medians of $\triangle XYZ$ in which $m\angle X = 60^\circ$, $m\angle Y = 45^\circ$ and $\overline{XY} = 6.3 \text{ cm}$. (Also write steps of construction).