Federal Board SSC-I (2011)

MATHEMATICS SSC-I

SECTION-A (Marks 15)

Time: 20 Minutes **Marks: 15**

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.

Q1. Circle the correct option i.e. A / B / C / D. Each part carries one mark.

i. **The domain of $R = \{(1,2),(2,3),(0,4)\}$ is**
A. $\{2,3,4\}$ B. $\{1,2,0\}$
C. $\{1,2,3\}$ D. $\{1,3,4\}$

ii. **Point $(1,-2)$ lies in the quadrant _____**
A. IV B. III
C. II D. I

iii. **The number π used in the circumference and area of circle is an _____ number.**
A. Real number B. Whole number
C. Irrational number D. Rational number

iv. **There exist a closure property w.r.t _____ in $\{0,1\}$.**
A. Division B. Multiplication
C. Subtraction D. Addition

v. **Aljabar-wal-Muqabla has been written by _____**
A. Jobst Burgi B. John Napier
C. Al-Khwarizmi D. Henry Briggs

vi. **The standard form of 2.35×10^{-2} is ___**
A. 1000 B. 700
C. 0.0235 D. 500

vii. **$(x-6)(x-4) =$ _____**
A. $x^2 - 10x + 24$ B. $x^2 + 10x - 24$
C. $x^2 - 10x - 24$ D. $x^2 + 10x + 24$

viii. **$(7-\sqrt{2})(7+\sqrt{2}) =$ _____**
A. 47 B. 36
C. 25 D. 45

ix. **What will be the factorization of $3x^2 - x - 2$ _____?**
A. $(x-1)(3x-2)$ B. $(x-1)(3x+2)$
C. $(x+1)(3x+2)$ D. $(x+1)(3x-2)$

x. **What will be added to $9a^2 - 12ab$ to make it a complete square?**
A. $-16b^2$ B. $16b^2$
C. $4b^2$ D. $6b^2$

xi. **If $\begin{bmatrix} x & 3 \\ 3 & 5 \end{bmatrix} = \begin{bmatrix} 6 & 3 \\ 3 & 5 \end{bmatrix}$, then $x =$ _____**
A. 0 B. 3
C. 5 D. 6

xii. **If $a = b$, $b = a$, then $a = c$. It is called**
A. Postulates B. Axiom
C. Given D. None of these

xiii. **The diagonals of a parallelogram _____ each other.**
A. Are parallel to
B. Are congruent
C. Bisect at right angle
D. Bisect

xiv. **There are _____ basic elements of triangle.**
A. Six B. Five
C. Four D. Three

xv. **If a transversal cuts two parallel lines, the pairs of corresponding angles so formed are _____ in number.**
A. Five B. Four
C. Three D. Two

MATHEMATICS SSC – I

Time allowed: 2:40 Hours **Total Marks: 60**

Note: Sections 'B' and 'C' are to be answered on the separately provided answer book. Answer eleven the questions from section 'B' and attempt any two questions from section 'C' Use supplementary answer sheet i.e., sheet B if required. Write your answers neatly and legibly.

Section – B (Marks 36)

Q2. Answer any TWELVE parts. All parts carry equal marks. (12 × 3 = 36)

i. **Find the values of x and y if**
$(x-2,\ 2) = (4,\ y+1)$

ii. If $A = \{1,2,3\}$, $B = \{2,3,4\}$ then write a binary relation in A and for $A \times B$, when $R = \{(x,y) | x \in A \wedge y \in B \wedge y > x\}$

iii. Simplify: $\sqrt{(-xyz)^4}$

iv. Simplify:
$$\left(\frac{x^b}{x^c}\right)^{\frac{1}{bc}} \times \left(\frac{x^c}{x^a}\right)^{\frac{1}{ac}} \times \left(\frac{x^a}{x^b}\right)^{\frac{1}{ab}} \quad x \neq 0$$

v. Find the value of x from the following segment: $\log_{81} 9 = x$

vi. Evaluate with the help of logarithm:
$$\frac{(8.97)^2 \times (1.059)^3}{57.7}$$

vii. What should be added to $4x^3 - 10x^2 + 12x + 6$ so that becomes exactly divisible $2x + 1$.

viii. For what value of m is $x - 5$ a factor of the polynomial: $6x^3 - 5x^2 - 16x + m$.

ix. Find the value of $x^3 + y^3 + z^3 - 3xyz$ when $x^2 + y^2 + z^2 = 69$ and $x + y + z = 13$

x. Factorize: $x^4 + 4$

xi. Factorize: $8x^3 - 6x - 9y + 27y^3$

xii. Find H.C.F by division method:
$2x^3 - 9x^2 + 9x - 7$, $x^3 - 5x^2 + 5x - 4$

xiii. Find L.C.M by factorization: $l^2 - m^2$, $l^4 - m^4$, $l^6 - m^6$

xiv. Simplify: $\frac{1}{x^2-3x+2} + \frac{1}{x^2-5x+6} + \frac{1}{x^2-4x+3}$

xv. Find the square root of:
$$\left(x^2 + \frac{1}{x^2}\right)^2 - 4\left(x + \frac{1}{x}\right)^2 + 12 \quad , \quad (x \neq 0)$$

xvi. If $P = \begin{bmatrix} 3 & -4 \\ -4 & 3 \end{bmatrix}$ and $Q = \begin{bmatrix} a & -6 \\ -6 & a \end{bmatrix}$
Then prove that $P^t = P$ and $Q^t = Q$

xvii. Use cramer's rule to solve:
$5x + 2y = 1$
$3x - y = -4$

xviii. Factorize with the help of factor theorem:
$x^3 - 11x^2 + 38x - 40$

Section – C (Marks 24)

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

Q3. Draw altitudes of ΔLMN in which $m\angle L = 60^0$, $m\angle M = 45^0$ and $\overline{LM} = 7.1\ cm$.

Q4. Prove that any point inside an angle, equidistant from its arms is on the bisector of it.

Q5. 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.

Q6. Prove that an exterior angle of a triangle is greater in measure than either of its opposite interior angles.