

2011



Roll No.

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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) 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  $\pi$  used in the circumference and area of circle is a / 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  $2.35 \times 10^{-2}$  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. 48      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. 6
- (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 to  
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

**For Examiner's use only:**

Total Marks:

15

Marks Obtained:

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# MATHEMATICS SSC-I

Time allowed: 2:40 Hours

Total Marks Sections B and C: 60

NOTE:- Answer 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 Answer any TWELVE parts. All parts carry equal marks. (12 x 3 = 36)

- (i) Find the value of  $x$  and  $y$  if  $(x - 2, 2) = (4, y + 1)$
- (ii) If  $A = \{1, 2, 3\}$  and  $B = \{2, 3, 4\}$  then write a binary relation  $R$  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:  $\left(\frac{x^b}{x^c}\right)^{1/bc} \times \left(\frac{x^c}{x^a}\right)^{1/ac} \times \left(\frac{x^a}{x^b}\right)^{1/ab}, x \neq 0$
- (v) Find the value of  $x$  from the following statement:  $\log_{81} 9 = x$
- (vi) Evaluate with the help of logarithms.  $\frac{(8.97)^2 \times (1.059)^3}{57.7}$
- (vii) What should be added to  $4x^3 - 10x^2 + 12x + 6$  so that it becomes exactly divisible by  $2x + 1$ ?
- (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:  $\frac{1}{x^2 - 3x + 2} + \frac{1}{x^2 - 5x + 6} + \frac{2}{x^2 - 4x + 3}$
- (xv) Find the square root of  $\left(x^2 + \frac{1}{x^2}\right)^2 - 4\left(x + \frac{1}{x}\right)^2 + 12, (x \neq 0)$
- (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 x 8 = 24)

- Q. 3 Draw altitudes of  $\triangle LMN$  in which  $m\angle L = 60^\circ$ ,  $m\angle M = 45^\circ$  and  $LM = 7.1\text{cm}$
- Q. 4 Prove that any point inside an angle, equidistant from its arms, is on the bisector of it.
- 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 Prove that an exterior angle of triangle is greater in measure than either of its opposite interior angles.