2009

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 and comprises pages 1–2. 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 Insert the correct option i.e. A / B / C / D in the empty box provided opposite each part. Each part carries one mark.

(i) If the number of elements in a set A is 2 and in a set B is 3, then number of elements in a set $A \times B$ will be: ☐

A. 2 B. 4

C. 6 D. 8

(ii) The range of $R = \{(1, 0)(2, 1)(4, 3)\}$ is : ☐

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

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

(iii) The additive inverse of zero is: ☐

A. Does not exist B. Zero

C. 1 D. None of these

(iv) $\forall x \in R, \quad x = x$ is called: ☐

A. Reflexive property
B. Symmetric property
C. Additive property
D. Multiplicative property

(v) The characteristic of $\log 0.00058$ is: ☐

A. 3 B. $\overline{3}$

C. 4 D. $\overline{4}$

(vi) The degree of polynomial $8x^3y + 3xy^2 + y$ is: ☐

A. 4 B. 3

C. 2 D. 1

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

A. 8 B. -8

C. 4 D. -4

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DO NOT WRITE ANYTHING HERE

(viii) $(x-6)(x-4) =$ _____.

A. $x^2+10x+24$ B. $x^2-10x-24$

C. $x^2+10x-24$ D. $x^2-10x+24$

(ix) $\begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$ is a/an _____ matrix.

A. Zero B. Identity

C. Rectangular D. Scalar

(x) If $A = \begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$ then order of AB is _____

A. 2×1 B. 2×2

C. 1×2 D. 1×1

(xi) If two lines intersect each other then non-adjacent angles are called:

A. Complementary angles
B. Alternate angles
C. Vertical angles
D. Supplementary angles

(xii) How many points are sufficient for drawing a straight line?

A. One B. Two

C. Three D. Four

(xiii) How many acute angles are there in an acute triangle?

A. One B. Two

C. Three D. None of these

(xiv) The lines which bisect the sides of a triangle perpendicularly, are called:

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

(xv) Construction of a triangle is possible when sides are:

A. $5cm,\ 5cm,\ 11cm$
B. $10cm,\ 3cm,\ 6cm$
C. $5cm,\ 5cm,\ 5cm$
D. $2cm,\ 3cm,\ 6cm$

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:- Sections 'B' and 'C' comprise pages 1–2 and questions therein are to be answered on the separately provided answer book. Answer any twelve parts from Section 'B' and attempt any three questions from Section 'C'. 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 power set of $\{+, -, \times, \div\}$

(ii) If $A=\{1, 2, 4\}$, $B=\{1, 3, 5, 7\}$ then write binary relation for $A\times B$ when $R=\{(x, y)\mid x\in A\wedge y\in B\wedge y<x\}$

(iii) If $U=\{x\mid x\in N\wedge x\leq 50\}$, $A=\{5, 10, 15,.....50\}$ and $B=\{10, 20, 30,.....50\}$ then show that $(A\cup B)^c=A^c\cap B^c$

(iv) Simplify: $\dfrac{b+\sqrt{b^2-a^2}}{b-\sqrt{b^2-a^2}}$

(v) Simplify: $\dfrac{(2)^{1/3}.(27)^{1/3}.(60)^{1/2}}{(180)^{1/2}.(4)^{-1/3}.(9)^{1/4}}$

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

(vii) Evaluate with the help of logarithms $\dfrac{475.8}{13.72}$

(viii) Convert the wavelength $4.5\times10^5 cm$ of blue light into meters and write it in standard form.

(ix) Find the value of $4ab$ when $a+b=15$ and $a-b=3$

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(x) If $x-\frac{1}{x}=3$ then find value of $x^3-\frac{1}{x^3}$

(xi) Use formula to find product of:

$(x-y+z)(x^2+y^2+z^2+xy+yz-zx)$

(xii) Factorize: $1+2ab-(a^2+b^2)$

(xiii) Factorize: $64a^3-343b^3-4a+7b$

(xiv) Find H.C.F by division method $x^4+x^3-6x^2$, x^4-9x^2.

(xv) Simplify: $\frac{1}{x-1}+\frac{1}{x+1}-\frac{x+2}{x^2+x+1}-\frac{x-2}{x^2-x+1}$

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

(xvii) Use Cramer rule to solve:

$0.8x-0.6y=1$

$0.6x+0.8y=2$

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

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 A quadrilateral having two opposite sides parallel and congruent is a parallelogram.

Q. 5 the right bisectors of the three sides of a triangle are concurrent.

Q. 6 Draw medians of ΔXYZ in which $m\angle X=60°$, $m\angle Y=45°$ and $XY=6.3cm$