

Roll No. Answer Sheet No. Sig. of Candidate. Sig. of Invigilator.

MATHEMATICS SSC-II

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) Which is a solution set of $|x| + 5 = 2$?
 A. $\{ \}$ B. $\{3, -3\}$ C. $\{7, -7\}$ D. $\{-3, 7\}$
- (ii) Solution set of $2x + 1 < 5$ is _____ (when $x \in W$).
 A. $\{1, 2\}$ B. $\{0, 1\}$ C. $\{0, 2\}$ D. $\{0, 1, 2\}$
- (iii) Which ordered pair satisfies $x - y = 3$?
 A. (0, 3) B. (3, 0) C. (2, 1) D. (1, 2)
- (iv) Eliminating z from $m - z = 2$ and $n + z = 4$ we get _____.
 A. $m + n = 6$ B. $m - n = 6$ C. $m + n = 2$ D. $m - n = 2$
- (v) The relation free from y for equation $y = 3t$ and $yt = 1$ is _____.
 A. $3t = 1$ B. $3t^2 = 1$ C. $t^2 = 3$ D. $t = 3$
- (vi) If $a : b = c : d$ then alternendo property is _____.
 A. $\frac{a}{c} = \frac{b}{d}$ B. $\frac{a}{b} = \frac{c}{d}$ C. $\frac{a+b}{b} = \frac{c+d}{d}$ D. $\frac{a-b}{b} = \frac{c-d}{d}$
- (vii) If $\frac{a}{b} = \frac{b}{c} = k$ then _____.
 A. $a = ck^2$ B. $a = bk^2$ C. $a = c^2k$ D. $a = b^2k$
- (viii) The difference between the largest and the smallest value in a given data is called _____.
 A. Variance B. Range C. Mean D. Standard deviation
- (ix) Formula of Variance for ungrouped data is _____.
 A. $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ B. $\sqrt{\sum(x-\bar{x})^2}$ C. $\frac{\sum(x-\bar{x})^2}{n}$ D. None of these
- (x) A tangent is a line touching a circle at _____ point(s).
 A. Two B. Three C. One D. No
- (xi) A circle passing through the three vertices of a triangle is called the _____.
 A. In circle B. Circumcircle C. E-circle D. Concentric circle
- (xii) In any triangle sum of measures of its any two sides is always _____ the third side.
 A. Less than B. Greater than C. Equal to D. Congruent to
- (xiii) $1 + \tan^2 \theta =$ _____.
 A. $\cot^2 \theta$ B. $\sec^2 \theta$ C. $\operatorname{cosec}^2 \theta$ D. $\sin^2 \theta$
- (xiv) $\sin 60^\circ = \sin(90^\circ - 30^\circ) =$ _____.
 A. $\sin 30^\circ$ B. $\cos 30^\circ$ C. $\cos^2 30^\circ$ D. $\tan 30^\circ$
- (xv) Value of $2 \sin 60^\circ \cos 60^\circ$ is _____.
 A. $\sqrt{3}$ B. $\frac{\sqrt{3}}{2}$ C. $\frac{\sqrt{3}}{4}$ D. None of these

For Examiner's use only:

Total Marks:

15

Marks Obtained:



MATHEMATICS SSC-II

26

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) Solve the linear equation $\frac{2}{3}(x-1) = \frac{1}{3}$
- (ii) Length of a rectangle is 3 cm more than 2 times its width. Its perimeter is 96 cm. Find the length and width of the rectangle.
- (iii) Find the solution set of $\frac{|y-3|}{3} = \frac{|y+2|}{2}$ when $y \in R$
- (iv) Find the solution set of $\sqrt{3y-5} + 1 = 8$
- (v) Solve $x^2 - 4x - 5 = 0$ using quadratic formula.
- (vi) Eliminate t from $v = u + at$; $s = ut + \frac{1}{2} at^2$
- (vii) Eliminate x from $x - \frac{1}{x} = 2a$; $x^3 - \frac{1}{x^3} = b^3$
- (viii) The ratio of two numbers is 2:3. If 8 is added to both the numbers, then the new ratio becomes 4:5. Find the numbers.
- (ix) If $p = \frac{2ab}{a+b}$ then find the value of $\frac{p+a}{p-a} + \frac{p+b}{p-b}$ using componendo dividendo theorem.
- (x) If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$ (where $a, b, c, d, e, f \neq 0$) then prove that $\frac{b^3 + d^3 + f^3}{a^3 + c^3 + e^3} = \frac{bdf}{ace}$.
- (xi) If $2x$ is added to 3, 5, 4 and 8, then new numbers are in proportion. Find the value of x .
- (xii) Following are the earnings (in Rs) of ten workers 88, 70, 72, 125, 115, 95, 81, 90, 95, 90. Calculate **Median** and **Mode**.
- (xiii) Find the variance from the given information $\bar{x} = 19.5$, $\sum x = 195$, $\sum x^2 = 5555$
- (xiv) Prove that $\frac{\cos\theta - \sec\theta}{\cos\theta + \sec\theta} = \frac{1 - \tan\theta}{1 + \tan\theta}$.
- (xv) Find the value of $\cos 60^\circ \cos 30^\circ + \sin 60^\circ \sin 30^\circ$.
- (xvi) Solve the triangle ABC when $m\angle A = 60^\circ$, $b = 5\text{cm}$, $m\angle B = 90^\circ$.
- (xvii) Prove that $2\cos^2\theta - 1 = 1 - 2\sin^2\theta$
- (xviii) Construct a triangle ABC when $\overline{mAB} = 4\text{cm}$, $m\angle A = 45^\circ$ and $m\angle B = 60^\circ$.

SECTION - C (Marks 24)

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

(3 x 8 = 24)

- Q.3 Prove that from a point, outside a line, the perpendicular is the shortest distance from the point to the line.
- Q.4 Prove that if two circles touch externally, the distance between their centres is equal to the sum of their radii.
- Q.5 Distance between two points P and Q is 6.5 cm. With centre at P, draw a circle of radius 3cm. Draw the tangents from the point Q to the circle.
- Q.6 Measure of an angle of an elevation of the top of a cliff is 25° . On walking 100 metres towards the cliff, measure of angle of elevation of the top is 45° . Find the height of the cliff.

Roll No.

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Answer Sheet No. _____

Sig. of Candidate _____

Sig. of Invigilator _____

MATHEMATICS SSC-II

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) Which is an open sentence?
A. $3 > 2$ B. $x + 2 = 3$ C. $-3 < -8$ D. $3 < 7$
- (ii) Which is a solution set of $|x| + 5 = 2$?
A. $\{ \}$ B. $\{3, -3\}$ C. $\{7, -7\}$ D. $\{-3, 7\}$
- (iii) Eliminating t from $t = \frac{1}{4q^2}$ and $3p^2 = \frac{1}{t}$, we get _____.
A. $3p^2q^2 = 4$ B. $12p^2q^2 = 1$ C. $3p^2 = 4q^2$ D. $4p^2 = 3q^2$
- (iv) Eliminating m from $m^3 = 2x$ and $m^2 = \frac{y}{2}$, we get _____.
A. $y^2 = 32x^3$ B. $y^3 = 32x^2$ C. $x^2 = 32y^3$ D. $x^3 = 32y^2$
- (v) If $5 : 8 = 5 : x$, then the value of x is _____.
A. 5 B. 25 C. 40 D. 8
- (vi) If $\frac{a}{b} = \frac{b}{c}$, then _____.
A. $b = ac$ B. $c^2 = ab$ C. $a^2 = bc$ D. $b^2 = ac$
- (vii) In a data, the value which appears or occurs most often is called _____.
A. Mode B. Median C. Average D. Arithmetic Mean
- (viii) The mean of 1, 4, 0, 7, 9 is _____.
A. 4 B. Zero C. 7 D. 4.2
- (ix) In similar triangles _____ are congruent.
A. Three corresponding angles B. Sides
C. Base D. Point
- (x) A triangle, having all the three sides equal is called _____.
A. Similar triangle B. Equilateral triangle
C. Base D. Line
- (xi) From a point outside a line _____ is the shortest distance.
A. Radius B. Perpendicular C. Point D. None of these
- (xii) The distance between any point on the circle and its centre is called the _____ of the circle.
A. Chord B. Circumference C. Radius D. Diameter
- (xiii) $\sin^2 \theta + \cos^2 \theta =$ _____.
A. 1 B. 2 C. $\tan^2 \theta$ D. $\cot^2 \theta$
- (xiv) $\cos(90^\circ - \theta) =$ _____.
A. $\sin \theta$ B. $\cos \theta$ C. $\tan \theta$ D. $\cot \theta$
- (xv) The mode of values 75, 76, 80, 80, 82, 82, 82, 85 is _____.
A. 82 B. 80 C. 81 D. None of these

For Examiner's use only:

Total Marks:

15

Marks Obtained:



MATHEMATICS SSC-II

28

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) The sum of four consecutive even numbers is 140. Find the numbers.
- (ii) Find the solution set of $\sqrt{y+3} = \sqrt{3y-5}$ and check.
- (iii) Find the solution set of $|x+2| - 3 = 5 - |x+2|$ when $x \in R$.
- (iv) Find the solution set of $5x^2 + 5x - 4 = 0$.
- (v) Eliminate t from $at^2 = x$; $bt^3 = y$
- (vi) Eliminate u from $v = u - gt$; $s = ut + \frac{1}{2}gt^2$
- (vii) Eliminate x from $x - \frac{1}{x} = \frac{a}{2}$; $x^2 + \frac{1}{x^2} = b^2$
- (viii) Find the value of x for $2x : 4 - x :: 2 : 3$
- (ix) If 16, a and 4 are in continued proportion, then find a
- (x) If $p = \frac{2ab}{a+b}$, then find the value of $\frac{p+a}{p-a} + \frac{p+b}{p-b}$ using componendo-dividendo theorem.
- (xi) Find the value of k if $a \propto b^3$ and $a = 250$ for $b = 5$
- (xii) Find the arithmetic mean for 4, 6, 10, 12, 15, 20, 25, 28, 30
- (xiii) Find the variance of 5, 13, 15, 25, 12, 18, 17, 19, 20, 16, 3
- (xiv) The Arithmetic mean of 45 numbers is 80. Find their sum.
- (xv) Prove that $\cos^2 \theta - \sin^2 \theta = 2\cos^2 \theta - 1$
- (xvi) Prove that $\tan \theta + \cot \theta = \frac{1}{\sin \theta \cos \theta}$
- (xvii) A tree is 72 m high. Find the angle of elevation of its top 100 m away on the ground level.
- (xviii) If $\sin 45^\circ$ and $\cos 45^\circ$ equal $\frac{1}{\sqrt{2}}$ each, then find $3\cos 45^\circ + 4\sin 45^\circ$

SECTION – C (Marks 24)

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

(3 x 8 = 24)

- Q.3** Prove that in a right angled triangle, the square of the length of hypotenuse is equal to the sum of the squares of the lengths of the other two sides.
- Q.4** Prove that if two sides of a triangle are unequal in length, the measure of the angle opposite to the longer side is greater than that of the angle opposite to the shorter side.
- Q.5** Prove that the two tangents, drawn to a circle from a point outside it, are equal in length.
- Q.6** Take a circle of radius 3 cm and draw a tangent at any point D on it.