# RUBRIC:  1<sup>st</sup>ANNUAL EXAMINATION SSC-II 2024
## SUBJECT:  GENERAL MATHEMATICS

| Q#/ Part # | Criteria | Level 1 (Marks) | Level 2(Marks) | Level 3 (Marks) | Level 4 (Marks) | Level 5 (Marks) | Level 6 (Marks) |
|---|---|---|---|---|---|---|---|
| 2(i) | Finding HCF of the given expression | Correctly factoring $1 - x^2$ (1) | Wrong answer (0) | | | | |
| | | Correctly factoring $1 + x^3$ (1) | Wrong answer (0) | | | | |
| | | Correctly factoring $1 - x - 2x^2$ (1) | Wrong answer (0) | | | | |
| | | Correctly finding the HCF (1) | Wrong answer (0) | | | | |
| 2(i) | Factorizing the expression | Correctly writing the expression as difference of two squares (1) | Wrong answer (0) | | | | |
| | | Correctly factoring difference of two squares (1) | Wrong answer (0) | | | | |
| | | Correctly writing the expression as sum & difference of two cubes (1) | Wrong answer (0) | | | | |
| | | Correctly factoring sum and difference of two cubes (1) | Wrong answer (0) | | | | |
| 2(ii) | Finding the value of $x^2 - \dfrac{1}{x^2}$ | Correctly finding the value of $\left(\dfrac{1}{x}\right)$ (1) | Wrong Answer (0) | | | | |
| | | Correctly finding the value of $\left(x + \dfrac{1}{x}\right)$ (1) | Wrong Answer (0) | | | | |
| | | Correctly finding the value of $\left(x - \dfrac{1}{x}\right)$ (1) | Wrong Answer (0) | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Correctly finding the value of $\left(x^2 - \frac{1}{x^2}\right)$ (1) | Wrong Answer (0) | | | |
| $2(ii)$ | Proving that $(B+C)A = BA + CA$ | Correctly finding matrix $B+C$ **AND** Correctly finding matrix $(B+C)A$ (2) | Correctly finding matrix $B+C$ **AND** Finding incorrect matrix $(B+C)A$ (1) | Wrong Answer (0) | | |
| | | Correctly finding matrix $BA, CA$ **AND** Correctly finding matrix $BA + CA$ (2) | Correctly finding matrix $BA, CA$ **AND** Finding incorrect matrix $BA + CA$ (1) | Correctly finding matrix $BA$ **OR** $CA$ **AND** Finding incorrect matrix $BA + CA$ (0.5) | Wrong Answer (0) | |
| $2(iii)$ | Finding the value of $k$ by setting remainder zero | Correctly finding the value of $P(2)$ (1) | Wrong Answer (0) | Wrong answer (0) | | |
| | | Correctly stating $P(2) = 0$ (1) | Wrong Answer (0) | Wrong answer (0) | | |
| | | Correctly simplifying $P(2) = 0$ (1) | Wrong simplification (0) | | | |
| | | Correctly finding the value of $k$ (1) | Wrong finding (0) | | | |
| $2(iii)$ | Finding square root of the given expression | Correctly finding three quotient terms **AND** Correctly writing the answer with $\pm$ sign (4) | Correctly finding two quotient terms **AND** Correctly writing the answer with $\pm$ sign (3) | Correctly finding one quotient term **AND** Correctly writing the answer with $\pm$ sign (2) | Partially correct quotient term (1) | Finding incorrect quotient terms (0) |
| $2(iv)$ | Finding the value of $P(-2)$ | Correctly substituting $x = -2$ in $P(x)$ (1) | Wrong answer (0) | | | |
| | | Correctly simplifying odd power terms (1) | Wrong answer (0) | | | |
| | | Correctly simplifying even power terms (1) | Wrong answer (0) | | | |
| | | Correctly finding the value of $P(-2)$ (1) | Wrong answer (0) | | | |
| $2(iv)$ | Solving the linear inequality | Correctly multiplying the in-equation by 6 (1) | Wrong answer (0) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Correctly reducing the fraction terms (1) | Wrong answer (0) | | | |
| | | Correctly simplifying for $x$ (1) | Wrong answer (0) | | | |
| | | Correctly showing the solution on real number line (1) | Wrong answer (0) | | | |
| 2(v) | Solving the linear inequality. | Correctly multiplying the in-equation by 12 (1) | Wrong answer (0) | | | |
| | | Correctly reducing the fraction terms (1) | Wrong answer (0) | | | |
| | | Correctly simplifying for $x$ (1) | Wrong answer (0) | | | |
| | | Correctly showing the solution on real number line (1) | Wrong answer (0) | | | |
| 2(v) | Solving equation by using the Quadratic formula | Correctly reducing the equation in pure quadratic form (1) | Wrong answer (0) | | | |
| | | Correctly applying the quadratic formula (1) | Wrong answer (0) | | | |
| | | Correctly finding 1$^{st}$ value of $x$ (1) | Wrong answer (0) | | | |
| | | Correctly finding 2nd value of $x$ (1) | Wrong answer (0) | | | |
| 2(vi) | Verifying that $(A + B)^t = A^t + B^t$ | Correctly finding matrix $(A + B)$ **AND** Correctly finding matrix $(A + B)^t$ (2) | Correctly finding matrix $(A + B)$ **AND** Finding incorrect matrix $(A + B)^t$ (1) | Wrong answer (0) | | |
| | | Correctly finding matrix $A^t, B^t$ **AND** Correctly finding matrix $A^t + B^t$ (2) | Correctly finding matrix $A^t, B^t$ **AND** Finding incorrect matrix $A^t + B^t$ (1) | Correctly finding matrix$A^t$  $OR$  $B^t$ (0.5) | Wrong answer (0) | |
| 2(vi) | Finding values of | Correctly finding the value of $p$ | Partially correct simplifications | Wrong answer | | |

| | | (2) | (1) | (0) | | |
|---|---|---|---|---|---|---|
| | (a) $\left(p+\frac{1}{p}\right)^2$ <br><br> (b) $\left(p-\frac{1}{p}\right)^2$ | Correctly finding the value of <br> $\left(p+\frac{1}{p}\right), \left(p+\frac{1}{p}\right)^2, \left(p-\frac{1}{p}\right), \left(p-\frac{1}{p}\right)^2$ <br> (2) | Any three correctly shown aspects (1.5) | Any two correctly shown aspects (1) | Any one correctly shown aspects (0.5) | No correct aspect (0) |
| 2(vii) | Finding the original Angle | Correctly stating the original angle (1) | Wrong answer (0) | | | |
| | | Correctly stating the resulting supplement angle (1) | Wrong answer (0) | | | |
| | | Correctly applying the given condition (1) | Wrong answer (0) | | | |
| | | Correctly finding the original angle (1) | Wrong answer (0) | | | |
| 2(vii) | Finding radius of the sphere | Correctly applying the volume formula (1) | Applying the wrong formula (0) | | | |
| | | Correctly substituting the values (1) | Wrong answer (0) | | | |
| | | Correctly making radius as subject of the formula (1) | Wrong answer (0) | | | |
| | | Correctly finding the radius of sphere (1) | Wrong answer (0) | | | |
| 2(viii) | Showing that points A, B and C are vertices of an isosceles triangle | Correctly finding the length \|AB\| (1) | Wrong answer (0) | | | |
| | | Correctly finding the length \|BC\| (1) | Wrong answer (0) | | | |
| | | Correctly finding the length \|AC\| (1) | Wrong answer (0) | | | |
| | | Correctly showing that $\|AC\| = \|BC\|$ (1) | Wrong answer (0) | | | |
| 2(viii) | Constructing a triangle with base length and base angles. | Correctly drawing base length 5cm (1) | Drawing base length incorrectly (0) | | | |
| | | Correctly drawing base angles 45°, 60° | Correctly drawing one of the base | Drawing base angles incorrectly. | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | (2) | angles (1) | (0) | | | |
| | | Correctly completing the triangle (1) | Wrong construction (0) | | | | |
| $2(ix)$ | Solving the simultaneous equations by Matrix Inversion Method | Correctly writing the system of equations in matrix form **AND** Correctly finding the value of $|A|$ (1) | Correctly writing the system of equations in matrix form **AND** Finding the incorrect value of $|A|$ (0.5) | Writing the system of equations in incorrect matrix form (0) | | | |
| | | Correctly finding the value of $adj(A)$ (1) | Wrong Answer (0) | | | | |
| | | Correctly finding the value of $A^{-1}$ (1) | Wrong Answer (0) | | | | |
| | | Correctly finding the values of $x$ **AND** $y$ (1) | Correctly finding the values of $x$ **OR** $y$ (0.5) | Wrong Answer (0) | | | |
| $2(ix)$ | Finding the hypotenuse length of a right isosceles triangle. | Correctly applying the Pythagoras' Theorem (1) | Applying the incorrect theorem. (0) | | | | |
| | | Correctly simplifying the equation (1) | Wrong Answer (0) | | | | |
| | | Correctly finding the squared value of hypotenuse (1) | Wrong Answer (0) | | | | |
| | | Correctly finding the hypotenuse length (1) | Wrong Answer (0) | | | | |
| 3 | Finding value of unknown '$k'$. | Correctly stating 1 as root **AND** Correctly stating $P(1)$ as Remainder (2) | Any one correct aspect (1) | Both aspects incorrect (0) | | | |
| | | Correctly finding the value of $P(1)$ (2) | Partially Correct Response (1) | Wrong Answer (0) | | | |
| | | Correctly applying Remainder Theorem **AND** Setting Remainder: $P(1) = 8$ | Any one correct aspect (1) | Both aspects incorrect (0) | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | (2) | | | | | |
| | | Correctly finding the value of $k$ (2) | Partially Correct Response (1) | Wrong Answer (0) | | | |
| 3 | Finding two consecutive positive numbers. | Correctly stating two consecutive positive numbers (2) | Correctly stating one consecutive positive number (1) | Incorrectly stating consecutive positive numbers (0) | | | |
| | | Correctly applying the condition (2) | Applying partially correct conditional equation (1) | Applying incorrect condition (0) | | | |
| | | Correctly writing the conditional equation in quadratic form (2) | Partially correct quadratic form of the conditional equation (1) | Incorrect quadratic form of the conditional equation (0) | | | |
| | | Correctly finding two consecutive positive numbers (2) | Correctly finding one consecutive positive number (1) | Finding two incorrect numbers (0) | | | |
| 4 | Calculating the cost of a belt and a wallet. (Matrix Inversion Method or Cramer's Rule) | Correctly forming two linear equations in two variables (2) | Correctly forming one linear equation in two variables (1) | Wrong answer (0) | | | |
| | | Correctly writing the system in matrix form. **AND** Correctly finding det(A) (2) | Correctly writing the system in matrix form **AND** Fining det(A) incorrectly (1) | Writing the system incorrectly in matrix form (0) | | | |
| | | Correctly finding the values of $$adj(A), A^{-1}$$ **OR** $|A_x|, |A_y|$ (2) | Any one correctly shown aspects (1) | Wrong answer (0) | | | |
| | | Correctly finding the cost of a belt **AND** Correctly finding the cost of a wallet (2) | Correctly finding the cost of a belt **OR** Correctly finding the cost of a wallet. (1) | Partially correct (0.5) | Wrong answer (0) | | |
| 4 | Finding dimensions of a rectangle | Correctly stating dimensions of the rectangle (2) | Stating dimensions partially correct (1) | Wrong dimensions (0) | | | |

| | | Correctly formulating the rectangular area AND Correctly substituting the values in the formula (2) | Correctly formulating the rectangular area AND Substituting incorrect values in the formula (1) | Wrong formula (0) | | | |
|---|---|---|---|---|---|---|---|
| | | Correctly finding the variables values (2) | Partially correct calculations (1) | Wrong Answer (0) | | | |
| | | Correctly finding values of the two dimensions (2) | Finding one correct dimension (1) | Wrong Answer (0) | | | |
| 5 | Constructing triangle ABC and drawing perpendicular bisectors of its sides | Correctly drawing $m\overline{BC} = 4.6cm, m\angle B = 110°, m\overline{AB} = 5cm$ (5) | Correctly drawing $m\overline{BC} = 4.6cm, \quad m\angle B = 110°$ (4) | Correctly drawing $m\overline{BC} = 4.6cm, m\overline{AB} = 5cm$ (3) | Correctly drawing $m\angle B = 110°$ (2) | Partially correct construction of any side or angle (1) | Wrong Constructio (0) |
| | | Correctly constructing perpendicular bisectors of all three sides (3) | Correctly constructing perpendicular bisectors of any two sides (2) | Correctly constructing perpendicular bisectors of anyone side (1) | Wrong construction (0) | | |
| 5 | Showing that given points are vertices of a right triangle | Correctly applying the distance formula **AND** Correctly finding $\|BC\|, \|AC\|, \|AB\|$ (5) | Correctly applying the distance formula **AND** Correctly finding $\|BC\|, \|AC\|$ (4) | Correctly applying the distance formula **AND** Correctly finding $\|BC\|$ (3) | Correctly applying the distance formula **AND** Finding $\|BC\|$ OR $\|AC\|$ **OR** $\|AB\|$ Partially correct (2) | Correctly applying the distance formula (1) | Applying incorrect distance formula (0) |
| | | Correctly verifying $\|BC\|^2 = \|AC\|^2 + \|AB\|^2$ **AND** Correctly declaring ABC a right triangle (3) | Correctly verifying $\|BC\|^2 = \|AC\|^2 + \|AB\|^2$ **AND** Not declaring ABC a right triangle (2) | Partialy correct calculations in verifying $\|BC\|^2 = \|AC\|^2 + \|AB\|^2$ (1) | Considering $\|BC\|^2 \neq \|AC\|^2 + \|AB\|^2$ (0) | | |

**NOTE: All Examiners must go through in solving the question paper themselves before ScreenMarking.**