Federal Board SSC-II Examination
General Mathematics Model Question Paper

SECTION – A

Time allowed: 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.

Q.1   Fill the relevant bubble for each part. Each part carries (01) mark.

i.   If $x = \sqrt{5} + 2$ then $\dfrac{1}{x} = ?$

    A. $\sqrt{5} - 2$ B. $-\sqrt{5} + 2$

    C. $-\sqrt{5} - 2$ D. $5 - \sqrt{2}$

ii.   For what value of k, $x^2 + 4kx - 5$ is completely divisible by $x - 1$?

    A. $\dfrac{3}{2}$ B. 1

    C. -1 D $-\dfrac{3}{2}$

iii.   The LCM of $x^2 - a^2$ and $(x+a)^2$ is

    A. $(x-a)(x+a)$ B. $(x-a)(x+a)^3$

    C. $(x-a)(x+a)^2$ D. $(x+a)^2$

iv.   The square root of $49x^2 + 112xy + 64y^2$ is

    A. $(7x+8y)^2$ B. $(7x+8y)$

    C. $(7x-8y)$ D. $\pm(7x+8y)$

v.   What is the solution set of $\sqrt{x-4} = -2$?

    A. $\{8\}$ B. $\{0\}$

    C. $\{2\}$ D. $\{\ \}$

vi.   The solution set of $|3x-4| = |x|$ is:

    A. $\{2,1\}$ B. $\{\ \}$

    C. $\{0\}$ D. $\{2\}$

vii.   What are the multiplicative factors of $(x-3)^2 - 4$?

    A. $(x-5)(x+1)$ B. $(x+5)(x-1)$

    C. $(x-5)(x-1)$ D. $(x+5)(x+1)$

viii. If A and B are square matrices, then which of the options is false?

A. $(AB)^t = B^t A^t$ B. $(A - B)^t = A^t - B^t$

C. $AB \neq BA$ D. $(kA)^t = k^t A^t$

ix. What is the value of x in the figure when $y = 40°$?

A. $10°$ B. $12.5°$

C. $35°$ D. $45°$

x. What is the value of x in the figure?

A. $45°$ B. $60°$

C. $30°$ D. $40°$

xi. What is the length of $\overline{AD}$ in the figure?

A. 8 B. 9

C. 17 D. $\sqrt{225}$

xii. Each side of an equilateral triangle is $10cm$. The height of triangle is

A. 5cm B. $5\sqrt{3}cm$

C. $10\sqrt{2}cm$ D. $10\sqrt{3}cm$

xiii. The volume of a right circular cylinder having radius $2cm$ and height $7cm$ is

A. $88cm^3$ B. $29.3cm^3$

C. $33.5cm^3$ D. $117.3cm^3$

xiv. The perpendicular distance of the point $(-3, 4)$ from $y-axis$ is

A. 4 B. -3

C. 3 D. 5

xv. For what value of x, distance between the points $A(4, x)$ and $B(1, 0)$ is 5 ?

A. 0 B. ± 2

C. ± 3 D. ± 4

Time allowed: 2.40 hours   Total Marks: 60

Note: Attempt all parts from Section 'B' and all questions from Section 'C' on the separately provided answer book. Write your answers neatly and legibly.

SECTION – B (Marks 36)

Note: Attempt all parts. Each part carries (04) marks.

Q2   i.   Find the continued product of $(2x-3y)(2x+3y)(4x^2+6xy+9y^2)(4x^2-6xy+9y^2)$

OR

Factorize $4x^4 - 5x^2 y^2 + y^4$

ii.   If $x = \sqrt{5}+2$ then find the value of $x^2 - \dfrac{1}{x^2}$

OR

Simplify the expression by rationalizing the denominator: $\sqrt{x^2+y^2} - \dfrac{x^2}{y+\sqrt{x^2+y^2}}$

iii.   If $P(x) = 3x^3 + kx - 26$ is divisible by $(x-2)$, then find the value of k, if remainder is zero.

OR

Find the square root of $36x^4 - 96x^3 + 76x^2 - 16x + 1$

iv.   Find the HCF of $x^3 + 27,\ 2x^2 - 5x - 3,\ x^2 - 2x - 15$

OR

Find the LCM of $x^2 - y^2, x^4 - y^4, x^6 - y^6$

v.   Solve $\dfrac{1}{2}(3+4x) \le 6\left(\dfrac{1}{3} - \dfrac{1}{2}x\right) - \dfrac{1}{4}(2+10x)$

and show the solution set on Number Line.

OR

Solve $\sqrt{2}x^2 + 7\sqrt{2}x + 12\sqrt{2} = 0$ by using the quadratic formula.

vi.   If $A = \begin{bmatrix} 5 & 2 \\ 2 & 1 \end{bmatrix}, B = \begin{bmatrix} 4 & 2 \\ 3 & -1 \end{bmatrix}$ then find $(AB)^{-1}$

OR

If $A = \begin{bmatrix} -6 & 4 \\ 3 & -2 \end{bmatrix}$, then verify that $A.A^{-1} = I = A^{-1}.A$

vii.   Draw a circle of radius $3cm$ with center at O. Draw a chord and shade the portion showing the major arc of the circle.

OR

Calculate radius of a sphere of volume $850m^3$

viii. Show that the points $A(-1,1)$, $B(3,2)$ and $C(7,3)$ are collinear.

OR

Draw a right isosceles triangle with length of equal sides 4cm and

ix. If $\triangle ABC \cong \triangle DEF$ then find the values of x, y and z.
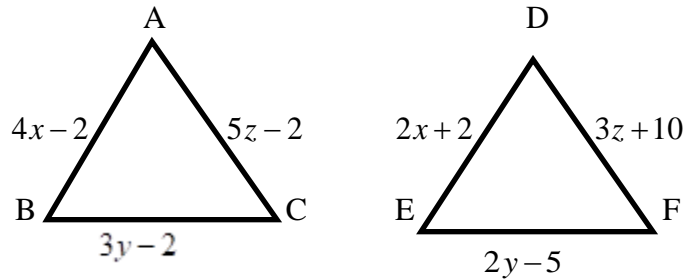
OR

If square of the hypotenuse of an isosceles right triangle is $128cm^2$ then find the length x of each side.
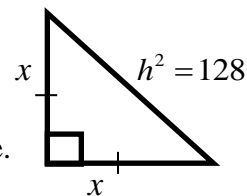
SECTION – C (Marks 24)

Note: Attempt all questions. Each question carries (08) marks.

Q.3 Simplify $\dfrac{x^2-1}{x^2+x-2} \times \dfrac{x^3+8}{x^4+4x^2+16} \div \dfrac{x^3+x}{x^3+2x^2+4x}$

OR

The sum of two positive numbers is 12 and the sum of whose squares is 80. Find the numbers.

Q.4 At a carry-out pizza restaurant, an order of 6 slice pizza and 2 juice drinks costs $Rs. 360$. A second order of 12 slice pizza and 5 juice drinks costs $Rs. 750$. Use Cramer's Rule to find the cost of a pizza slice and a juice drink.

OR

The length and breadth of a rectangle are $(3x+2)cm$ and $(3x-2)cm$ respectively. Find the value of x and the perimeter if area of the rectangle is $77cm^2$.

Q.5 Draw medians of a triangle ABC with $m\overline{BC}=5cm$, $m\angle B=60°$ and $m\angle C=30°$

OR

Draw two intersecting circles with radii 4cm and 3cm. If their centres are 6cm apart, then draw two direct common tangents to the circles.

Federal Board of Intermediate and Secondary Education
SSC-II Examinations
Model Question Paper General Mathematics
(Curriculum 2007)
Alignment of Questions with Students Learning Outcomes

Sec-A Q 1	Contents and Scope	Student Learning Outcomes *	Cognitive Level **	Allocated Marks
i	11.1 Algebraic Expressions	vi) Reduce a given rational expression to its lowest terms.	K	1
ii	12.2 Remainder Theorem and Factor Theorem	ii) Find remainder (without dividing) when a polynomial is divided by a linear polynomial.	U	1
iii	13.1 Highest Common Factor and Least Common Multiple	i)Find highest common factor (HCF) and least common multiple (LCM) of algebraic expressions.	U	1
iv	13.3 Square Root of Algebraic Expression	Find square root of an algebraic expression by factorization and division.	U	1
v	11.3 Surds and their Application	ii) Solve the equation, involving absolute value, in one variable.	U	1
vi	14.2 Equation involving Absolute Value	i) Find highest common factor (HCF) and least common multiple (LCM) of algebraic expressions.	U	1
vii	12.1 Factorization	Type iv: $a^2 - b^2$	U	1
viii	16.4 Multiplication of Matrices	viii) Verify the result $(AB)^t = B^t A^t$	K	1
ix	17.1 Properties of Angles	iii) Calculate unknown angles involving adjacent angles, complementary angles, supplementary angles and vertically opposite angles.	A	1
x	17.6 Circle	iv) Apply the above properties in different geometrical figures.	A	1
xi	19.1 Pythagoras Theorem 17.6 Circle	ii) Solve right angled triangle using Pythagoras theorem. i) Describe a circle and its center, radius, diameter, chord, arc, major and minor arcs, semicircle and segment of the circle.	A	1

xii	19.1 Pythagoras Theorem	iv) Apply the above properties in different geometrical figures.	U	1
xiii	19.3 Volumes	i) Find the volume of • a right circular cylinder whose base radius and height are given.	K	1
xiv	20.1 Distance Formula	iii) Use distance formula to find distance between two given points.	U	1
xv	20.1 Distance Formula	iii) Use distance formula to find distance between two given points.	K	1

Sec-B Q 2	Contents and Scope	Student Learning Outcomes *	Cognitive Level **	Allocated Marks
i	11.2 Algebraic Formulas **OR** 12.1 Factorization	iii) Know the formulas $(a \pm b)^3 = a^3 \pm 3ab(a \pm b) \pm b^3$ $a^3 \pm b^3 = (a \pm b)(a^2 \mp ab + b^2)$ • Find the continued product of $(x + y)(x - y)(x^2 - xy + y^2)(x^2 + xy + y^2)$ **OR** Type vi: $a^4 + a^2b^2 + b^4$ or $a^4 + 4b^4$	K+K	4+4
ii	11.4 Rationalization	Explain rationalization (with precise meaning) of real numbers of the types, $\frac{1}{a+b\sqrt{x}}$, $\frac{1}{\sqrt{x}+\sqrt{y}}$ and their combinations where x and y are natural numbers and a and b are integers.	U+U	4+4
iii	12.2 Remainder Theorem and Factor Theorem **OR** 13.3 Square Root of Algebraic Expression	ii) Find remainder (without dividing) when a polynomial is divided by a linear polynomial. **OR** Find square root of an algebraic expression by factorization and division.	U+K	4+4
iv	13.1 Highest Common Factor and Least Common Multiple	i) Find highest common factor (HCF) and least common multiple (LCM) of algebraic expressions.	K+K	4+4
v	14.4 Solving Linear Inequalities **OR** 15.3 Quadratic Formula	Solve linear inequalities with rational coefficients. **OR** ii) Use quadratic formula to solve quadratic equations.	U+U	4+4
vi	16.4 Multiplication of Matrices 16.5 Multiplicative Inverse of a Matrix **OR** 16.5 Multiplicative Inverse of a Matrix	ii) Multiply two (or three) matrices. vi) Use adjoint method to calculate inverse of a non-singular matrix. **OR** v) Find multiplicative inverse of a non-singular matrix A and verify that $A A^{-1} = I = A^{-1} A$, where I is the identity	U+U	4+4

		matrix.		
vii	17.6 Circle. **OR** 19.3 Volumes	i) Describe a circle and its center, radius, diameter, chord, arc, major and minor arcs, semicircle and segment of the circle. **OR** i) Find the volume of a sphere and a hemisphere when radius is given.	U+U	4+4
viii	20.2 Collinear Points **OR** 18.1 Construction of Triangle	iii) Use distance formula to show that given three (or more) points are collinear. **OR** i) Construct a triangle having given: • two sides and the included angle.	A+A	4+4
ix	17.4 Congruent Triangles **OR** 19.1 Pythagoras Theorem	Apply following property for congruency between two triangles. • SSS = SSS **OR** ii)Solve right angled triangle using Pythagoras theorem.	A+A	4+4

Sec-C QNO.	Contents and Scope	Student Learning Outcomes *	Cognitive Level **	Allocated Marks
3	13.2 Basic Operations on Algebraic Fractions **OR** 15.2 Solution of Quadratic Equations	Use HCF and LCM to reduce fractional expressions involving $+, -, \times, \div$. **OR** Solve a quadratic equation in one variable by • factorization, • completing the square.	U+U	8+8
4	16.6 Solution of simultaneous Linear Equations **OR** 15.3 Quadratic Formula	Solve a system of two linear equations and related real-life problems in two unknowns using • Cramer's rule. **OR** ii) Use quadratic formula to solve quadratic equations.	A+U	8+8
5	18.1 Construction of Triangle **OR** 19.2 Areas	ii) Draw: • medians, of a given triangle and verify their concurrency. **OR** i) Find the area of • a rectangle when its two sides are given.	K+K	8+8

Federal Board of Intermediate and Secondary Education
ASSESSMENT GRID FOR MODEL QUESTION PAPER

Subject: General Mathematics   **Examination: Annual 2024**   **Class/Level: SSC-II**   **Curriculum: 2007**

Topics	11. Algebraic Formulas and Applications	12. Factorization	13. Algebraic Manipulation	14. Linear Equations and Inequalities	15. Quadratic Equations	16. Matrices and Determinants	17. Fundamentals of Geometry	18. Practical Geometry	19. Areas and Volumes	20. Introduction to Coordinate Geometry	Total marks for each assessment objective
Knowledge based	1 i (1) 2 i (4)	2 i (4)	2 iii (4) 2 iv (4) 2 iv (4)			1 viii (1)		5 (8)	1 xiii (1) 5 (8)	1 xv (1)	**40** **30%**
Comprehension based	1 v (1) 2 ii (4) 2 ii (4)	1 ii (1) 1 vii (1) 2 iii (4)	1 iii (1) 1 iv (1) 3 (8)	1 vi (1) 2 v (4)	2 v (4) 3 (8) 4 (8)	2 vi (4) 2 vi (4)	2 vii (4)		1 xii (1) 2 vii (4)	1 xiv (1)	**68** **50%**
Application based						4 (8)	1 ix (1) 1 x (1) 1 xi (0.5) 2 ix (4)	2 viii (4)	1 xi (0.5) 2 ix (4)	2 viii (4)	**27** **20%**
Total marks for each topic	**14**	**10**	**22**	**05**	**20**	**17**	**10.5**	**12**	**18.5**	**06**	**135**

- ➤ 1, 2, 3 etc stands for question numbers
- ➤ i, ii, iii etc. stands for part of question numbers
- ➤ (1), (2), (3) etc. stands for marks of question papers