

Roll No. (To be filled in by the candidate) (Session: 2019 - 2021 to 2022 - 2024)
 MATHEMATICS (SCIENCE) 023-1st Annual-(9th CLASS) Time Allowed : 20 Minutes
 Q.PAPER - I (Objective Type) GROUP - I Maximum Marks : 15
 PAPER CODE = 5191

1	A	B	C	D	6	A	B	C	D	11	A	B	C	D
2	A	B	C	D	7	A	B	C	D	12	A	B	C	D
3	A	B	C	D	8	A	B	C	D	13	A	B	C	D
4	A	B	C	D	9	A	B	C	D	14	A	B	C	D
5	A	B	C	D	10	A	B	C	D	15	A	B	C	D

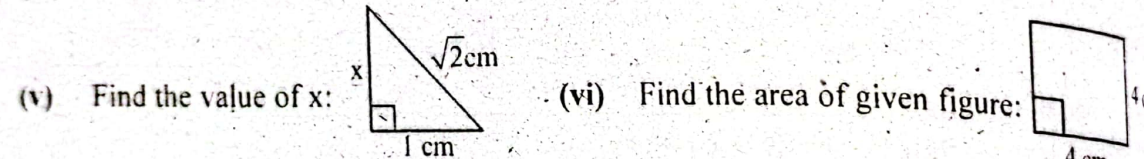
Note: Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

Sr.	Questions	A	B	C	D
1-1	Product of $\begin{bmatrix} x & y \\ 2 & -1 \end{bmatrix}$ is -----:	$[2x + y]$	$[x - 2y]$	$[2x - y]$	$[x + 2y]$
2	Which set has closure property w.r.t addition:	$\{0\}$	$\{0, -1\}$	$\{0, 1\}$	$\{1, \sqrt{2}, \frac{1}{2}\}$
3	$\log e = \text{-----}$, where $e \approx 2.718$:	0	0.4343	∞	1
4	$(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b})$ is equal to:	$a^2 + b^2$	$a^2 - b^2$	$a + b$	$(a - b)$
5	Factors of $5x^2 - 17xy - 12y^2$ are:	$(x + 4y), (5x + 3y)$	$(x - 4y), (5x - 3y)$	$(x - 4y), (5x + 3y)$	$(5x - 4y), (x + 3y)$
6	L.C.M. of $a^2 + b^2$ and $a^4 - b^4$ is -----:	$a^2 + b^2$	$a^4 - b^4$	$a^2 - b^2$	$a - b$
7	Which is the solution of the inequality $3 - 4x \leq 11$?	-8	-2	$\frac{14}{4}$	None of these
8	If $(x, 0) = (0, y)$, then (x, y) is:	$(0, 0)$	$(0, 1)$	$(1, 0)$	$(1, 1)$
9	Distance between the points $(1, 0)$ and $(0, 1)$ is:	0	1	$\sqrt{2}$	2
10	Sum of interior angles of a triangle is:	90°	180°	360°	0°
11	Total number of medians in a triangle are:	3	2	1	4
12	The right bisectors of the sides of the triangle are -----:	Parallel	Collinear	Concurrent	Non-concurrent
13	Ratio between two elements 'a' and 'b' is represented by:	$a + b$	$a \times b$	$a - b$	$a : b$
14	The region enclosed by the bounding lines of a closed figure is called ---- of the figure:	Perimeter	Area	Volume	None of these
15	The medians of a triangle cut each other in the ratio ---:	4:1	3:1	2:1	1:1

2. Write short answers to any Six (6) questions:
- (i) What is meant by adjoint of a matrix?
 - (ii) $A = \begin{bmatrix} 2 & 3 \\ 1 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & -4 \\ -2 & -1 \end{bmatrix}$ then find $2A + 3B$
 - (iii) Simplify: $\frac{4(3)^n}{3^{n+1} - 3^n}$
 - (iv) Simplify: $\sqrt[4]{81y^{12}x^8}$
 - (v) Calculate: $\log_2 2 \times \log_2 81$
 - (vi) Find the value of x: $\log x = 0.0044$
 - (vii) If $a + b = 10$ and $a - b = 6$ then find the value of $a^2 + b^2$
 - (viii) Simplify: $\sqrt[3]{243x^9y^{10}z^{15}}$
 - (ix) Factorize: $125x^3 - 216y^3$

3. Write short answers to any Six (6) questions:
- (i) Use factorization to find the square root of: $4x^2 - 12x + 9$
 - (ii) Solve the inequality: $4x - 10.3 \leq 21x - 1.8$
 - (iii) Define strict inequalities.
 - (iv) Write the given equation in the form of $y = mx + c$: $3 - 2x + y = 0$
 - (v) Define cartesian plane.
 - (vi) Find the distance between two points: $A(-4, \sqrt{2}), B(-4, -3)$
 - (vii) Define right angle triangle.
 - (viii) What is meant by H.S \cong H.S?
 - (ix) One exterior angle formed on producing one side of a parallelogram is 40° . Find the measures of its interior angles.

4. Write short answers to any Six (6) questions:
- (i) Define bisection of an angle.
 - (ii) Justify that 2 cm, 3 cm and 5 cm are not the lengths of triangle.
 - (iii) Define ratio.
 - (iv) Define similar triangles.



- (vii) Verify that the triangle having the following measures of sides are right-angled: $a = 5\text{cm}, b = 12\text{cm}, c = 13\text{cm}$.
- (viii) Define ortho centre.
- (ix) Construct a $\triangle ABC$, in which: $m\overline{AB} = 4.8\text{cm}, m\overline{BC} = 3.7\text{cm}, m\angle B = 60^\circ$

(PART - II)

Note: Attempt THREE questions in all. But question No.9 is Compulsory.

5. (a) Solve the equation with help of matrix inverse method: $3x - 4y = 4, x + 2y = 8$
- (b) Simplify: $\left(\frac{a^{2l}}{a^{l+m}}\right)\left(\frac{a^m}{a^{m+n}}\right)\left(\frac{a^{2n}}{a^{n+l}}\right)$
6. (a) Use logarithm table to find the value of: $\sqrt[5]{2.709} \times \sqrt[3]{1.239}$
- (b) If $a + b + c = 7$ and $ab + bc + ca = 9$ then find the value of $a^2 + b^2 + c^2$
7. (a) Factorize by factor theorem: $x^3 - x^2 - 22x + 40$
- (b) Simplify to the lowest form: $\frac{x^3 - 8}{x^2 - 4} \times \frac{x^2 + 6x + 8}{x^2 - 2x + 1}$
8. (a) Solve the inequalities: $-6 < \frac{x-2}{4} < 6$
- (b) $\triangle ABC$, draw perpendicular bisectors of its sides and verify that they are concurrent: $m\overline{AB} = 4\text{cm}, m\overline{BC} = 4.8\text{cm}, m\overline{AC} = 3.6\text{cm}$
9. Prove that "the right bisectors of the sides of a triangle are concurrent".
 OR prove that "triangle on equal bases and of equal altitudes are equal in area".

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MATHEMATICS (SCIENCE) Q-PAPER - I (Objective Type)

023-1st Annual-(9th CLASS) GROUP - II

(Session: 2019 - 2021 to 2022 - 2024)

Time Allowed : 20 Minutes

PAPER CODE = 5196

Maximum Marks : 15

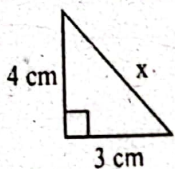

	A	B	C	D		A	B	C	D		A	B	C	D
1	(A)	(B)	(C)	(D)	6	(A)	(B)	(C)	(D)	11	(A)	(B)	(C)	(D)
2	(A)	(B)	(C)	(D)	7	(A)	(B)	(C)	(D)	12	(A)	(B)	(C)	(D)
3	(A)	(B)	(C)	(D)	8	(A)	(B)	(C)	(D)	13	(A)	(B)	(C)	(D)
4	(A)	(B)	(C)	(D)	9	(A)	(B)	(C)	(D)	14	(A)	(B)	(C)	(D)
5	(A)	(B)	(C)	(D)	10	(A)	(B)	(C)	(D)	15	(A)	(B)	(C)	(D)

Note: Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

Sr.	Questions	A	B	C	D
1	$4x + 3y - 2$ is an algebraic -----:	Expression	Sentence	Equation	D
2	The symbol used for "is perpendicular to":		⊥	≡	↔
3	Congruent figures have same -----:	Mode	Area	Median	Diagonal
4	Bisection means to divide into ----- equal parts:	3	1	2	4
5	Imaginary part of $-i(3i + 2)$ -----:	2ab	-2	3	-3
6	In parallelogram opposite sides are -----:	Opposite	Diagonal	Same	Congruent
7	One angle on the base of an isosceles triangle is 30° , what is the measure of its vertical angle:	30°	60°	90°	120°
8	The logarithm of unity to any base is -----:	1	10	e	0
9	Factors of $5x^2 - 17xy - 12y^2$ are:	$(x + 4y), (5x + 3y)$	$(x - 4y), (5x - 3y)$	$(x - 4y), (5x + 3y)$	$(5x - 4y), (x + 3y)$
10	$\begin{bmatrix} \sqrt{2} & 0 \\ 0 & \sqrt{2} \end{bmatrix}$ is called ----- matrix:	Zero	Unit	Scalar	Singular
11	Mid point of the $(2, -2)$ and $(-2, 2)$ is:	$(0, 0)$	$(1, 0)$	$(0, 1)$	$(1, 1)$
12	----- has no unit:	Ratio	Proportion	Congruent	Equality
13	If the capacity 'c' of an elevator is at most 1600 pounds, then -----:	$c < 1600$	$c \geq 1600$	$c \leq 1600$	$c > 1600$
14	H.C.F of $a^3 + b^3$ and $a^2 - ab + b^2$ is -----:	$a + b$	$a^2 + b^2$	$(a - b)^2$	$a^2 - ab + b^2$
15	If $y = 2x + 1, x = 2$ then y is -----:	2	3	4	5

2. Write short answers to any Six (6) questions:
- (i) Define singular matrix.
 - (ii) If $A = \begin{bmatrix} 3 & 0 \\ -1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 6 \\ 5 \end{bmatrix}$ then find $A+B$.
 - (iii) Simplify: $\sqrt[3]{-\frac{8}{27}}$
 - (iv) Simplify and write answer in $a + bi$ form: $\frac{2-i}{1+i}$
 - (v) Find the value of x : $\log_3 x = 4$
 - (vi) Find the value of x : $\log x = 0.1224$
 - (vii) Reduce to the lowest form: $\frac{8a(x+1)}{2(x^2-1)}$
 - (viii) Simplify: $\frac{4}{5}\sqrt{125}$
 - (ix) Factorize: $x^2 - 11x - 42$

3. Write short answers to any Six (6) questions:
- (i) Find the L.C.M: $39x^7y^3z, 91x^5y^6z^7$
 - (ii) Define Linear inequality and write the standard form.
 - (iii) Solve: $-\frac{1}{3}x + 5 \leq 1$
 - (iv) Draw the point $(4, -5)$ on the graph.
 - (v) Define cartesian plane.
 - (vi) Find the distance between the points: $A(3, -1), B(5, 2)$
 - (vii) Define equilateral triangle.
 - (viii) What is meant by $S.S.S \cong S.S.S$?
 - (ix) Define parallelogram.

4. Write short answers to any Six (6) questions:
- (i) Define the bisector of line segment.
 - (ii) 3 cm, 4 cm and 7 cm are not the lengths of the triangle. Give the reason.
 - (iii) Define ratio.
 - (iv) Define Pythagoras theorem.
 - (v) Find the value of x : 
 - (vi) Define altitude of a triangle.
 - (vii) Find the area of given figure 
 - (viii) Define incentre of a triangle.
 - (ix) Construct a ΔXYZ , in which: $m\overline{XY} = 5.5\text{cm}, m\overline{ZX} = 4.5\text{cm}, m\angle Z = 90^\circ$

(PART - II)

Note: Attempt THREE questions in all. But question No.9 is Compulsory.

5. (a) Use the matrix inversion method to solve linear equations: $4x + 2y = 8$
 $3x - y = -1$
- (b) Simplify: $\frac{(81)^n \times 3^5 - (3)^{4n-1} (243)}{(9^{2n})(3^3)}$
6. (a) Use log tables of find the value of: 0.8176×13.64
 (b) $x^2 + y^2 + z^2 = 78$ and $xy + yz + zx = 59$ then find the value of $x + y + z$
7. (a) Factorize by factor theorem: $x^3 - 2x^2 - x + 2$
 (b) Find the square root by division method: $x^4 - 10x^3 + 37x^2 - 60x + 36$
8. (a) Solve: $\left| \frac{x+5}{2-x} \right| = 6$
 (b) Construct triangle ABC, draw the perpendicular bisectors of its sides:
 $m\overline{AB} = 5.3\text{cm}, m\angle A = 45^\circ, m\angle B = 30^\circ$
9. Prove that any point on the right bisector of a line segment is equidistant from its end points.
- OR Prove that the parallelograms on the same base and between the same parallel (or of the same altitude) are equal in area.