THE VILLAGE
INTERNATIONAL SCHOOL
"We Nurture Dreams"

AIM HIGH, TOGETHER WE FLY

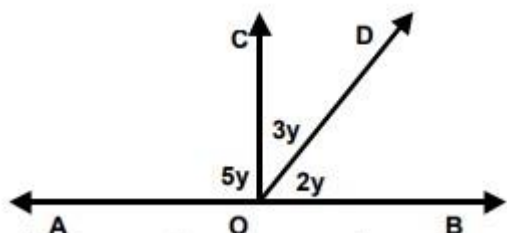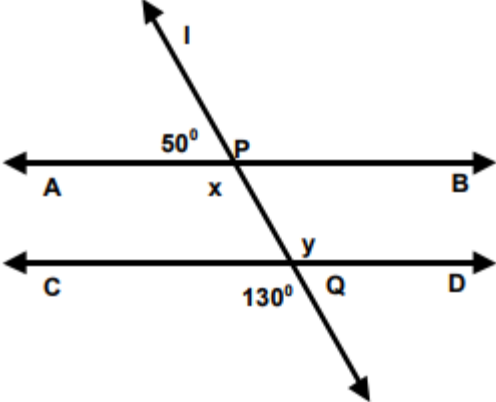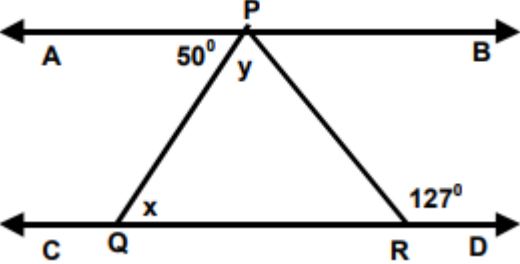|		
Grade: 9	**Mathematics**	**Time: 3 Hours**
Date: 13/09/2023	**Term-1 Examination 2023**	**Max. Marks: 80**

General Instructions:
1. This Question Paper has 5 Sections A, B, C, D, and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case-based integrated units of assessment (04 marks each) with sub-parts of 1, 1, and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks, and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
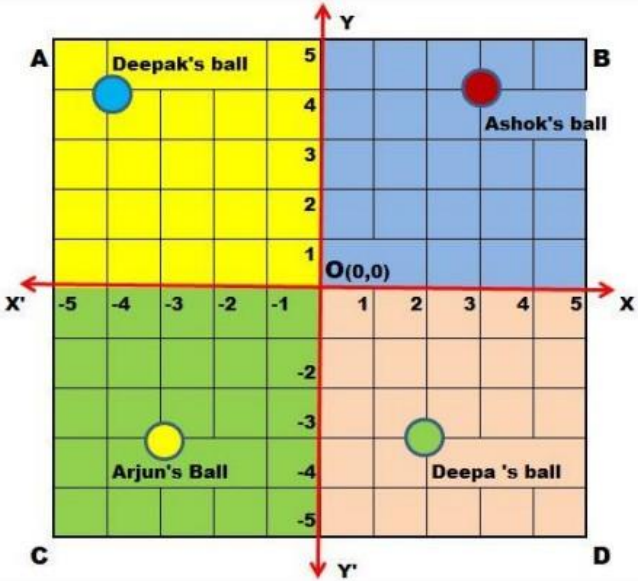8. Draw neat figures wherever required. Take п =22/7 wherever required if not stated.

Sl No.	**SECTION A** *(Section A consists of 20 questions of 1 mark each.)*	Marks :
1	Which one of the following is **not** a rational number: (a) $\sqrt{81}$ (b) 9.111 (c) 5.151515… (d) 7.070070007….	1
2	The zero of the polynomial 2x-7 is (a) $-\frac{7}{2}$ (b) $\frac{7}{2}$ (c) $\frac{2}{7}$ (d) $\frac{-2}{7}$	1
3	The solution of the equation 2x+3y =6 is	1

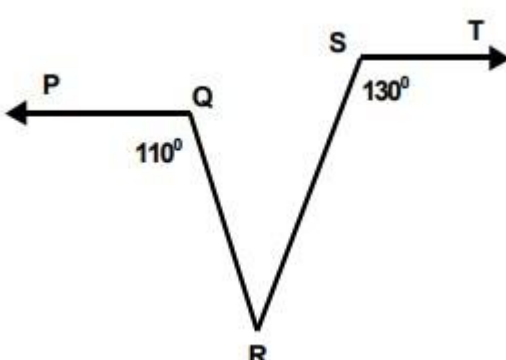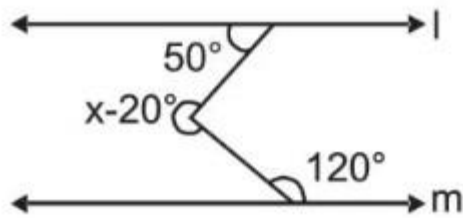|		
	(a) (0,3) (b) (3,0) (c) (2,3) (d) (1,1)	
4	The value of $(125)^{\frac{2}{3}}$ is, (a) 5 (b) 25 (c) 45 (d) 35	1
5	The abscissa of all the points on y-axis will be (a) 0 (b) 1 (c)-1 (d) any number	1
6	The value of $(\sqrt{11} + \sqrt{7})(\sqrt{11} - \sqrt{7})$ (a)4 (b) 7 (c)11 (d)18	1
7	The point (-4, 5) lies in (a) quadrant I (b) quadrant II (c) quadrant III (d) quadrant IV	1
8	If x-1 is a factor x^2 -2ax +3a ,then the value of a is (a) -2 (b) -1 (c) 2 (d) 1	1
9	The co-ordinates of any point on the x-axis is of the form (a) (1,1) (b) (0, y) (c) (x , 0) (d) (0,0)	1
10	The perpendicular distance of the point P(3,4) from the y-axis is (a)3 (b)4 (c)5 (d)7	1
11	The decimal representation of an irrational number will be (a) only terminating	1

	(b) only non- terminating (c) non terminating &recurring (d) non terminating & non-recurring		
12	The value of $P(t) = t^3 + 2t - 3$ for $P(2)$ is (a)0 (b)6 (c)9 (d)12	1
13	In the following figure, AOB is a line. Find the value of y. (a) 18^0 (b) 30^0 (c) 60^0 (d) 90^0	1
14	The linear equation x + y =6 has , a) a unique solution b) two solutions c) infinitely many solutions d) no solution.	1
15	The product of two irrational numbers is (a)always irrational (b)always rational (c)rational or irrational (d)neither rational nor irrational	1
16	The value of $\sqrt{1^3 + 2^3 + 3^3}$ is (a) 1 (b)6 (c) 12 (d)36	1
17	To rationalize the denominator of $\frac{1}{\sqrt{a}+b}$ we multiply this by (a)$\frac{1}{\sqrt{a}-b}$ (b) $\frac{1}{\sqrt{a}+b}$ (c) $\sqrt{a} - b$ (d) $\frac{\sqrt{a}-b}{\sqrt{a}-b}$	1

18	If x - 1 is a factor of the polynomial $x^2 - kx$, then the value of k is: (a) 0 (b) 1 (c)-1 (d) 2	1
	ASSERTION AND REASONING Which among the following statements about Assertion and Reason is correct. (a) both **Assertion** and **Reason** are **correct** and Reason is the **correct explanation** of Assertion. (b) both **Assertion** and **Reason** are correct, but Reason is **not the correct explanation** of Assertion. (c) If **Assertion** is **correct** but **Reason** is **incorrect**. (d) If **Assertion** is **incorrect** but **Reason** is **correct**	
19	**ASSERTION** : $\sqrt{4}$ is a real number. **REASON:** Real numbers consist of both rational and irrational numbers and $\sqrt{5}$ is an irrational number.	1
20	**ASSERTION** : The point (-3,0) lies on the x axis. **REASON**: Any point lying on x - axis will have its ordinate 0.	1
	SECTION B *(Section B consists of 5 questions of 2 marks each.)*	

21	If AB ll CD and *l* is a transversal. Find the values of x and y.	2
22	Find the area of the rectangle ABCD with A(0,0) , B(4,0) and C (4,2) and D(0,2).	2
23	Show that 0.2353535... can be expressed in the form $\frac{p}{q}$ where p and q are integers and q≠0.	2
24	If the two points are A (-3,7) and B(-7,5), then what is (abscissa A)- (abscissa B)?	2
25	In the figure ,if AB ll CD, <APQ =50⁰ AND <PRD = 127⁰, Find x and y.	2
	SECTION C *(Section C consists of 6 questions of 3 marks each.)*	
26	Represent $\sqrt{3.5}$ on the number line.	3

27	Expand the following
	
	    (i) $\quad (4a - b + 2c)^2$
	
	    (ii) $\quad (\frac{1}{x} + \frac{y}{3})^3$
		3

28	Factorise $1 - 64a^3 - 12a + 48a^2$. Write the identity used.	3

29	Read the Source/Text given below and answer the following questions:
	
	There is a square park ABCD in the middle of Saket colony in Delhi. Four children Deepak, Ashok, Arjun and Deepa went to play with their balls. The colour of the ball of Ashok, Deepak, Arjun and Deepa are red, blue, yellow and green respectively. All four children roll their ball from centre point O in the direction of XOY, X'OY, X'OY' and XOY'.
	
	Their balls stopped as shown in the above image. Answer the following questions:
	
	    (i) What are the coordinates of the ball of Ashok?
	
	    (ii) What is the line XOX' called?
	
	    (iii) What is the ordinate of the ball of Arjun?
		
		1
		
		1
		
		1

30	(a) "After 5 years age of mother will be three times the age of her son." Represent the above statement as a linear equation in two variables. (b) If x = 2 and y = 3 is a solution of 2x + 3y = k, find the value	1 2

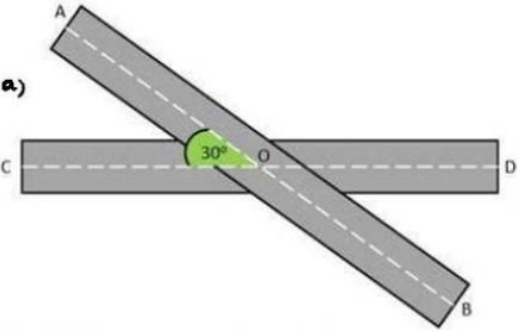|		
	of k.	
31	In the figure, if PQ ll RS, $< PQR = 110^0$ and $< RST = 130^0$ then find the value of $< QRS = 110^0$. 	3
	SECTION D *(Section D consists of 4 questions of 5 marks each.)*	
32	Simplify by rationalizing the denominator, $\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2}$	5
33	(i)Without actually calculating the cubes, find the value of each of the following: $(-12)^3 + (7)^3 + (5)^3$	2
	(ii)If x − 3 and **x -** $\frac{1}{3}$ are both factors of $px^2 + 5x + r$, then show that p = r.	3
34	The taxi fare in a city is as folllws: for the first kilometer, the fare is Rs.8 and for the subsequent distance it is Rs.5 per kilometer. (i) Taking the distance covered by as x km and total fare as Rs.y write a linear equation in two variables in the form of ax + by +c = 0 to represent the following situation. (ii) Write down the values of a, b and c. (iii) suggest any two solutions for the above equation.	2 1 2
35	For what value of x, *l* ll *m.*	5

	SECTION E **CASE STUDY QUESTIONS** *(Section E consists of 3 questions of 4 marks each.)*	

36	In a school 5 out of 7 students participated in a competition organized by the school authorities. Answer the following questions:
	(i) What fraction of students participated in the competition?
	   (a) $\frac{2}{7}$ (b) $\frac{5}{7}$ (c) $\frac{5}{12}$ (d) $\frac{2}{5}$
	(ii) Write the decimal expansion of this fraction.
	   (a) 0.7142857142857143..
	   (b) 0.714
	   (c) 7.14285
	   (d) 1.4
	(iii) What kind of decimal expansion is this?
	   (a) Terminating
	   (b) Non-terminating and recurring
	   (c) Non-terminating non-recurring
	   (d) Non of the above
	
	(iv) The decimal expansion of an irrational number is
	   (a) Terminating
	   (b) Non-terminating and recurring
	   (c) Non-terminating and non-recurring
	   (d) None of the above
		4

37	Syam, who is a social worker wants to distribute masks and hand sanitizer in his village. The number of masks and hand sanitizer distributed in one day can be represented by the zeroes of the polynomial $P(x) = x^2 - 2x + 1$. Answer the following questions based on the above information:	4

(i)Which of the following pair can be zeroes of P(x)?

    (a)   (1,-1)
    (b)   (-1,-1)
    (c)   (1,1)
    (d)   (-1,1)

(ii)The value of the polynomial P(x) at x= 2 is

    (a)   0
    (b)   1
    (c)   5
    (d)   9

(iii)What is the sum of the zeroes?

    (a)   0
    (b)   1
    (c)   2
    (d)   -2

(iv)What is the product of the zeroes?

    (a)   0
    (b)   1
    (c)   -1
    (d)   2

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38 | Harry was going on a road trip with his father. They were travelling on a straight road. After riding for some distance, they reach a cross road where one straight road cuts the other at 30^0. Now using the given information answer the following questions: | **4**

    (i) Find the measure of <AOD
        (a) 30^0

(b) 130^0

(c) 150^0

(d) 180^0

(ii) Find the measure of <BOD

  (a) 30^0

  (b) 130^0

  (c) 150^0

  (d) 180^0

(iii) What is the measure of <BOA.

  (a) 30^0

  (b) 60^0

  (c) 150^0

  (d) 180^0

(iv) Which of the following statement is correct?

  (a) Vertically opposite angles are always supplementary.

  (b) Vertically opposite angles are always complementary.

  (c) Vertically opposite angles are always equal.

  (d) Vertically opposite angles have common arms.