Ambience Public School

Mid Term, Exam 2024-25

Class IX

Subject: Mathematics

06.09.2024

Max Time: 3 Hour

Max Marks: 80

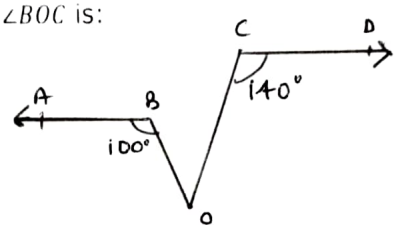
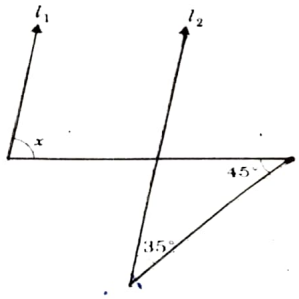
Total no. of questions: 38

Total number of pages: 6

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 the values of 1, 1 and 2 marks each respectively.

	SECTION A (Section A consists of 20 questions of 1 mark each.)	
1.	If $\frac{2024^{x}}{5} = 32^{0} \times 5^{-1}$, then the value of x is: A. -1 B. 0 C. 1 D. 2	1
2.	If $64^{2m-5} = 4 \times 8^{m-5}$. The value of m is: A. 9/17 B. 17/9 C. 17/10 D. 20/9	1
3.	The decimal expansion of the number $\sqrt{2}$ is: A. a finite decimal C.1.41421 B. non-terminating recurring D.non-terminating non-recurring	1
4.	If $x + y = 5$, $x^2 + y^2 = 15$, then xy is A. 1 B. 3 C. 2 D. 5	1
5.	If $x = 5^{\frac{1}{3}} \times 5^{\frac{2}{3}}$, then the value of $x^3 - 15x + 5$ is. A. 30 B. 35 C. 55 D. 45	1
6.	$\sqrt{5}$ is a polynomial of degree: A. 2 B. 0 C. 1 D. 1/2	1
7.	Mirror image of the coordinate (0,7) along the x- axis is: A. (0,7) B. (7,0) C. (0,-7) D. (-7,0)	1
8.	Two points having same abscissa but different ordinates lie on: A. X axis C. a line parallel to y-axis B. y- axis D. a line parallel to x- axis	1

9.	The points whose abscissa and ordinate have same signs will lie in: A. I and II quadrants B. II and III quadrants C. I and III quadrants D. II and IV quadrants	1
10.	Euclid arranged all known work in the field of mathematics in his treatise called: A. Elements B. Axioms C. Theorems D.Postulate	1
11.	In the figure AB ∥ CD, the value of $\angle BOC$ is: A. 60° B. 70° C. 140° D. 120° 	1
12.	Through two points: A. A unique line can be drawn B. Two lines can be drawn C. No line can be drawn D. More than two lines can be drawn	1
13.	$l_1 \parallel l_2$. The value of $2x - 70^\circ$ is: A. 80° B. 110° C. 140° D. 160° 	1
14.	The graph of 2x + 3y = 6 is a line which meets the y-axis at the point. A. (2, 0) B. (3, 0) C. (0, 2) D.(0, 3)	1
15.	If the point (-2, 2) lies on the graph of 3y = ax + 7, then the value of 2a+3 is: A. 1/2 B. 1 C. 2 D. 4	1
16.	Any point on the line x=8 is of the form: A. (8,a) B. (8,0) C.(a, 8) D. (8,0)	1
17.	If the area of an equilateral triangle is $16\sqrt{3}\ cm^2$, then the perimeter of the triangle is: A. 48 cm B. 24 cm C. 12 cm D. 36 cm	1

18. Which of the following statements is **incorrect**.

A. Area of a triangle = $\frac{1}{2}$ × base × height

B. Area of a triangle is $\sqrt{s(s-a)(s-b)(s-c)}$, where $s = \frac{a+b+c}{2}$

C. Area of an equilateral triangle with side a is $\frac{\sqrt{3}}{4}a^2$

D. Area of a triangle is $\sqrt{s(s-a)(s-b)(s-c)}$, where $s = \frac{a+b+c}{2}$

19. DIRECTION: In question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option.

Assertion (A): If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 3 : 2, then the smaller of the two angles is 72°.

Reason (R): If a transversal intersects two parallel lines, then each pair of interior angles on the same side of the transversal is supplementary.

A. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

B. Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A).

C. Assertion (A) is true but reason (R) is false.

D. Assertion (A) is false but reason (R) is true.

20. **Assertion (A):** Raj and Ali have the same weight. If each gains weight by 3 kg, then Euclid's second axiom will be used to compare their weights.

Reason (R): According to Euclid's second axiom, when equals are added to equals the wholes are equal.

A. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

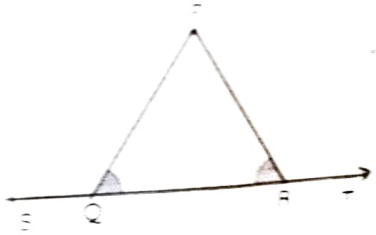
B. Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A).

C. Assertion (A) is true but reason (R) is false.

D. Assertion (A) is false but reason (R) is true.

SECTION B (Section B consists of 5 questions of 2 marks each.)

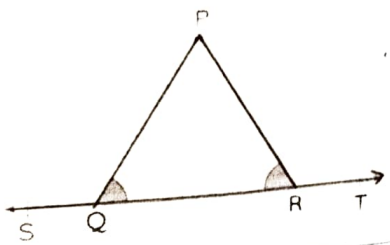
21. In fig. $\angle PQR = \angle PRQ$. Then prove that $\angle PQS = \angle PRT$. 2

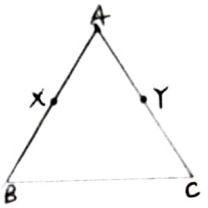


22. Express $1.132323232\ldots$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$. 2

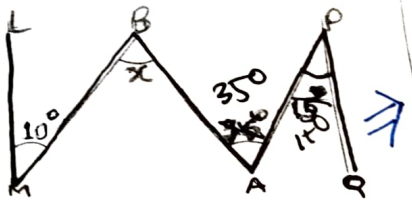
18	Which of the following statements is **incorrect.** A. Area of a triangle = (½)x base x height. B. Area of a triangle is $\sqrt{s(s-a)(s-b)(s-c)}$, where $s = (a+b+c)/2$ C. Area of an equilateral triangle with side 'a' is $\frac{\sqrt{3}}{4}a^2$ D. Area of a triangle is $\sqrt{s(s-a)(s-b)(s-c)}$, where $s = (a+b+c)/4$	1
19	DIRECTION: In question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option **Assertion (A):** If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 5 : 4, then the larger of the two angles is 100°. **Reason (R):** If a transversal intersects two parallel lines, then the sum of the interior angles on the same side of the transversal is 180°. A. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) B. Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) C. Assertion (A) is true but reason (R) is false. D. Assertion (A) is false but reason (R) is true	1
20.	**Assertion (A):** Raj and Ali have the same weight. If each gains weight by 3 kg, then Euclid's second axiom will be used to compare their weights. **Reason (R):** According to Euclid's second axiom, when equals are added to equals the wholes are equal. A. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) B. Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) C. Assertion (A) is true but reason (R) is false. D. Assertion (A) is false but reason (R) is true	1

SECTION B (Section B consists of 5 questions of 2 marks each.)

21.	In fig $\angle PQR = \angle PRQ$. Then prove that $\angle PQS = \angle PRT$.  	2
22.	Express 1.132323232... in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$	2

23.	Give an example of a polynomial in one variable, which is : a. monomial of degree 1 c. Binomial as well as Cubic polynomial b. Trinomial of degree 20 d.Linear Polynomial	2
24.	In given figure AX = AY, AB = AC show that BX = CY 	2
25.	In a zoo there are some rabbits and birds . One observes that the total number of eyes are 120 and total number of legs are 160, then write two equations formed and a solution of each equation. (it is assumed that there is no deformity in any animal or bird)	2

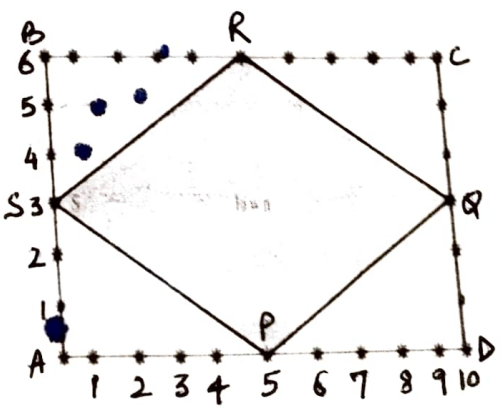
SECTION C (Section C consists of 6 questions of 3 marks each.)

26.	In the given figure QP || ML, find the value of x 	3
27.	Factorise: 1. $8x^3 - y^3 - 12x^2y + 6xy^2$ 2. $2x^2 - 7x - 15$	3
28.	If x = 3k – 2, y = 2k is a solution of equation 4x – 7y + 12 = 0, then find the value of 2K+1.	3
29.	The sides of a triangle are x, x+1, 2x-1 and its area is $x\sqrt{10}$ sq. units. Find the value x.	3
30	Write the coordinates of the vertices of a rectangle whose length and breadth are **5** and **3** units respectively, one vertex at the origin, the longer side lies on the x-axis and one of the vertices lies in the third quadrant.	3
31.	Solve: $\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \frac{1}{\sqrt{4}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{6}} + \frac{1}{\sqrt{6}+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{8}}$ **OR** If $x = 9 - 4\sqrt{5}$, then find a. $x^2 + \frac{1}{x^2}$ b. $x + \frac{1}{x}$	3

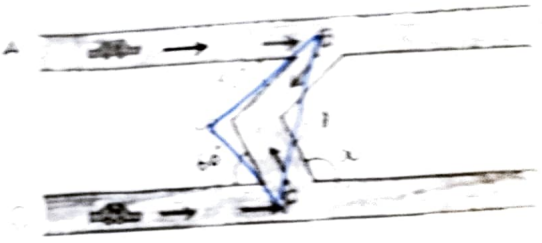
SECTION D (Section D consists of 4 questions of 5 marks each.)

32.	In the figure, two straight lines PQ and RS intersect each other at point O. If $\angle POT = 60°$. Find the value of a, b and c. 	5
33.	Factorise $x^3 + 13x^2 + 32x + 20$	5
34.	Write 3y+7= 8x in the form of ax + by + c = 0. Also mention the value of a, b and c. Find any two solutions of the equation. How many solutions can you find?	5
35.	If $x = 2^y$ and $\frac{9 \times 3^{2x} - 3^x \times 3^{x-2}}{2} = 360$. Find the value of y. OR Show that $\frac{7\sqrt{3}}{\sqrt{10}+\sqrt{3}} - \frac{2\sqrt{5}}{\sqrt{6}+\sqrt{5}} - \frac{3\sqrt{2}}{\sqrt{15}+3\sqrt{2}} = 1$	5

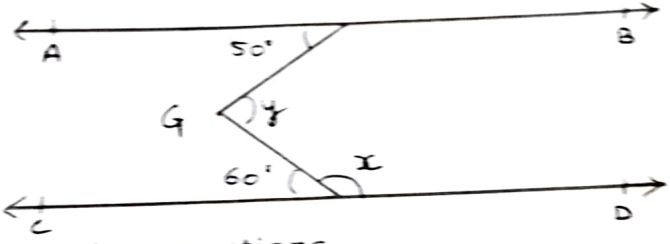
SECTION E (Case Base Questions)

36.	The Class IX students of a secondary school in Krishinagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a lawn PQRS in the ground as shown in the figure below. 	4
	A. What are the coordinates of C, taking A as origin?	1
	B. What are the coordinates of R, taking D as origin?	1
	C. Find the length of the side of the lawn ?	2

37. Two cars are moving on two parallel roads represented as AB and CD respectively in the given figure. First car reached at point E and takes a turn towards its right at an angle of 50°. At the same time, the second car reaches at point F and takes a turn towards its left at an angle of 60°. They both meet at a point G.



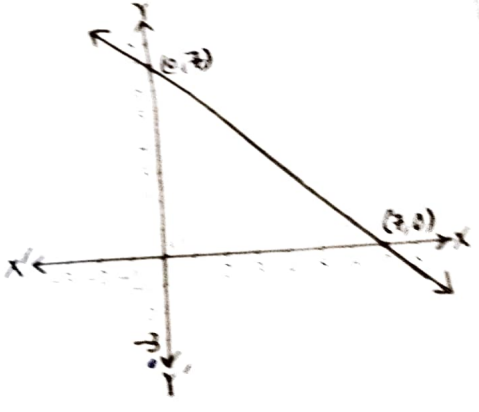
Based on the above information and given figure, answer the following questions (without considering the width of the roads)



Answer the following questions

A. What will be the measure of angle x marked in the figure?
B. What will be the measure of ∠EGF marked as y ?
C. What will be the measures of reflex ∠EGF ? If EF is joined, what type of triangle will EGF make ?

38. *Aditya purchased two types of chocolates A and B at the rate of Rs. x and Rs. y respectively.* The total amount spent is Rs. 7. After reaching home, he forms a linear equation in two variables for two types of chocolates. He prepares a table and a graph of the linear equation as shown in adjoining graph:



A. What is the equation formed?
B. Find the point of intersection of the line x=4 and the line he drew.
C. Find the area of a triangle formed by the lines x=0, y=0 and the line passing through (0,7) and (7,0)