No. of printed pages: 5

INDIAN SCHOOL SOHAR

PERIODIC TEST II (2023-24)

MATHEMATICS – (041)

CLASS: IX **MAX. MARKS: 80**

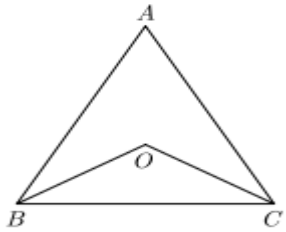
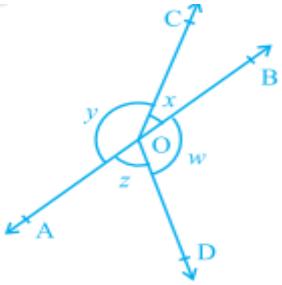
DATE: 17/09/23 **TIME: 3 HOURS**

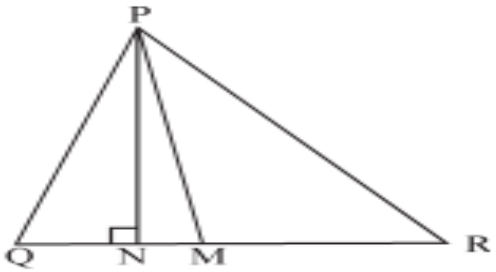
General Instructions:

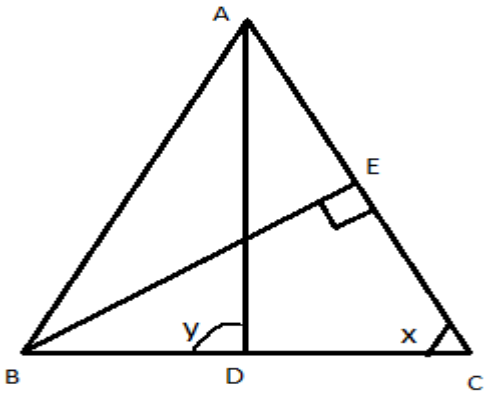
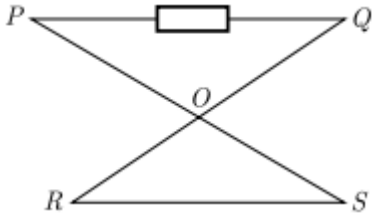
1. This Question Paper has 5 Sections A, B, C, D, and E.
2. Section A has 20 MCQs carrying 1 mark each.
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 Case Based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Questions of 2 marks, 2 Questions of 3 marks and 2 Questions of 5 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat diagrams wherever required.

	SECTION A	
	Section A consists of 20 questions of 1 mark each.	
Q. No		**Marks**
1	The value of $(256)^{0.16}$ X $(256)^{0.09}$ (a) 4 (b) 16 (c) 64 (d) 256.25	1
2	If a = $2+\sqrt{3}$ then the value of a + $\frac{1}{a}$ is (a) 4 (b) $\sqrt{3}$ (c) $2\sqrt{3}$ (d) None of these	1
3	A point whose abscissa is -3 and ordinate is 2 lies in (a)Ist quadrant (b)IInd quadrant (c) IIIrd quadrant (d) IVth quadrant	1
4	If the coordinates of the point P and Q are P(- 2, 3) and Q(-3,5)then (abscissa of P) – (abscissa of Q) is (a)- 5 (b) 1 (c)-1 (d) - 2	1
5	The measure of the angle between the coordinate axes is (a) 0^0 (b) 90^0 (c) 180^0 (d) 270^0	1
6	The perpendicular distance of a point P (- 3, - 5) from X-axis is (a)3 (b) -3 (c) 5 (d) - 5	1
7	The distance of the point P (3,4) from the origin is (a) 3 (b) 4 (c) 7 (d) 5	1
8	If (2, 0) is a solution of linear equation 2x + 3y = k, then the value of k is: (a)4 (b) 6 (c) 5 (d) 2	1
9	Equation of the line y = 0 represents (a) X-axis (b) Y-axis (c)Origin (d) None of these	1

10	The graph of the linear equation 2x + 3y = 6 cuts the y-axis at the point (a) (2,0) (b) (0,2) (c) (3,0) (d) (0,3)	1
11	How many lines can pass through two distinct points? (a) 1 (b) 0 (c) 2 (d) Infinite	1
12	It is known that if x + y = 10, then x + y + z = 10 + z. The Euclid's axiom that illustrates this statement is (a)First Axiom (b) Second Axiom (c) Third Axiom (d) Fourth Axiom	1
13	If A, B and C are three points on a line and B lies between A and C, then (a) AB + AC = BC (b) AB + BC = AC (c) AC + BC = AB (d) None of these	1
14	Two supplementary angles differ by 28°. Then the angles are (a) 76°, 104° (b) 72°, 108° (c) 32°, 58° (d) None of these	1
15	If one angle of a triangle is equal to the sum of the other two angles, then the triangle is (a) isosceles triangle (b) obtuse triangle (c) a right triangle (d) None of these	1
16	If AB = QR, BC = RP and CA = PQ, then which of the following holds (a) ΔABC ≅ ΔPQR (b) ΔCBA ≅ ΔPQR (c) ΔCAB ≅ ΔPQR (d) ΔBCA ≅ ΔPQR	1
17	If the area of an equilateral triangle is 16 $\sqrt{3}$ cm^2, then its perimeter is (a) 8 cm (b) 64 cm (c) 24 cm (d)16 cm	1
18	An isosceles right triangle has area 8 cm^2. The length of its hypotenuse is (a) $\sqrt{32}$ cm (b) $\sqrt{16}$ cm (c) $\sqrt{48}$ cm (d) $\sqrt{24}$ cm	1
	Direction for questions 19 & 20: In question numbers 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option.	
19	**Assertion (A):** Given two distinct points, there is a unique line that passes through them. **Reason (R):** If A, B and C are three points on a line and B lies between A and C then AB + BC = AC (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 but 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):** The points (-3,5) and (5, -3) are at different positions in the coordinate plane. **Reason (R):** If x ≠ y then (x, y) ≠ (y, x) (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 but 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	Find the area of an isosceles triangle whose perimeter is 11cm and base is 5 cm	2

22	Rationalise the denominator of $\frac{2+3\sqrt{5}}{2-3\sqrt{5}}$ **OR** If $2^{5x} \div 2^{x} = \sqrt[5]{32}$ then find the value of 'x'	2
23	In the given figure, AC = BD, then prove that AB = CD 	2
24	Find the coordinates of the point: (i) Which lies on x and y axes both (ii) Whose abscissa is 2 and which lies on the x -axis	2
25	Find the supplement of $\frac{3}{5}$ of a right angle **OR** In the given figure, Δ ABC is an equilateral triangle. The bisectors of ∠ABC and ∠ACB meet at O. Find the measure of ∠BOC 	2
	SECTION C	
	Section C consists of 6 questions of 3 marks each.	
26	The sides of a triangle are x, x + 1, 2x – 1 and its area is x $\sqrt{10}$. Find the value of 'x'.	3
27	The points A (a, b) and B (b,0) lie on the linear equation y = 8 x + 3. (i) Find the value of a and b (ii) Find two solutions of y = 8 x + 3.	3
28	Prove that if two lines intersect each other, then the vertically opposite angles are equal. **OR** In Fig, if x + y = w + z, then prove that AOB is a line 	3
29	Express $15.7\overline{12}$ in the form $\frac{p}{q}$, where p and q are integers, q ≠ 0	3
30	In a triangle ABC, AB = AC, E is the mid-point of AB and F is the mid-point of AC. Show that BF = CE	3

31	If a = 2, b = 3, then find the value of $(a^b + b^a)^{-1}$ **OR** Write the following in the ascending order of their magnitude $\sqrt[4]{3}, \sqrt[3]{2}, \sqrt[3]{4}$	3
	SECTION D	
	Section D consists of 4 questions of 5 marks each	
32	Bisectors of $\angle$B and $\angle$C of Δ ABC intersect each other at the point O. Prove that $\angle BOC = 90° + \frac{1}{2} \angle A$ **OR** In the figure, ∠Q > ∠ R and M is a point on QR such that PM is the bisector of ∠QPR. If the perpendicular from P on QR meets QR at N, prove that $\angle MPN = \frac{1}{2}(\angle Q - \angle R)$  	5
33	Prove that two triangles are congruent if two angles and the included side of one triangle are equal to two angles and the included side of other triangle.	5
34	Which of the following points A $(0, \frac{17}{3})$, B (2,6), C (1,5) and D (5,1) lie on the linear equation 2(x + 1) + 3 (y – 2) = 13	5
35	Simplify $\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \ldots\ldots\ldots + \frac{1}{3+\sqrt{8}}$ **OR** Simplify the following into a fraction with rational denominator $\frac{1}{\sqrt{5}+\sqrt{6}-\sqrt{11}}$	5
	SECTION E	
	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.	
36	**Case Study – 1** Dinesh has a regular hexagonal shaped plot in a corner of village Ramgarh. Each side of the hexagonal plot is 10 m. He wants to fill the hexagonal shaped plot by equilateral triangles shaped tiles (i) How many equilateral triangles of side 10 m are there in the hexagonal plot? — 1 (ii) What is the area of the hexagonal shaped plot? (iii) If each side of equilateral triangular shaped tile is 2 m, then what is the area of each tile? — 1 **OR** What is the number of equilateral triangular tiles of side 2 m that is required to fill the hexagonal plot? — 2	

37.	**Case Study – 2** Mohan has a triangle field ABC. He divided the whole field into two triangular fields ABD and ACD. After measuring he found that BC = AB, ∠EBC = 40^o and ∠CAD = 30^o. Again, he divided the whole field into two triangular fields ABE and CBE. His son is in Class IX. So, he assumed ∠ACD = x^o and ∠ADB = y^o. He prepared some questions based on his field and he asked his son to solve the questions:  (i) Find the value of x (ii) Find the value of y (iii) Find ∠BAD **OR** Find ∠ABE	1 1 2
38	**Case Study – 3** During education tour of class IX, the teacher asked the students to measure the distance between the two objects P and Q including an obstacle between them. This obstacle prevents the students for direct measurement. One of the students, devices an ingenious solution to the problem. Firstly, she fixes a pole at a convenient point 'O" so that both P and Q are visible. Then, she fixes another pole at point S on the line PO produce such that PO = SO, in a similar way, she fixes a third pole at point R on the intended line QO such that QO = RO. Then she measures the distance between R and S  (i) Is she able to measure the distance between P and Q. Justify? (ii) From which criteria of congruency, she applied here. (iii) Is Δ POQ ≅ Δ SOR. Justify? **OR** If RS = 15 m, what is the measure of PQ. Give reason.	1 1 2

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