B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL
TERM 1 EXAMINATION (2026-27)
MATHEMATICS: SET 1

Class: IX **Time: 3hrs**
Date: 07-09-26 **Max Marks: 80**
Admission no: **Roll no:**

General instructions:
1. The Question paper contains- five sections A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.
2. Section A has 18 MCQ's and 02 Assertion-Reason based questions of 1 mark each.
3. Section B has 5 very short (VSA)- type questions of 2 marks each.
4. Section C has 6 short (SA)- type questions of 3 marks each.
5. Section D has 4 long (LA)- type questions of 5 marks each.
6. Section E has 3 source based/case-based questions of 4 marks each

SECTION A

1. Between two rational numbers 1M
   (A) there is no rational number
   (B) there is exactly one rational number
   (C) there are infinitely many rational numbers
   (D) there are only rational numbers and no irrational numbers
2. Decimal representation of a rational number cannot be 1M
   (A) terminating
   (B) non-terminating
   (C) non-terminating repeating
   (D) non-terminating non-repeating
3. The decimal expansion of the number square root of 2 is 1M
   (A) a finite decimal
   (B) 1.41421
   (C) non-terminating recurring
   (D) non-terminating non-recurring
4. Every rational number is 1M
   (A) a natural number
   (B) an integer
   (C) a real number
   (D) a whole number
5. If $x^2 + kx + 6 = (x + 2)(x + 3)$ for all x, then the value of k is 1M
   (A) 1 (B) –1 (C) 5 (D) 3
6. The value of the polynomial $5x – 4x^2 + 3$, when $x = –1$ is 1M
   (A) – 6 (B) 6 (C) 2 (D) –2
7. Zero of the zero polynomial is 1M
   (A) 0 (B) 1 (C) Any real number (D) Not defined
8. If one angle of a triangle is equal to the sum of the other two angles, then the triangle is 1M

(A) an isosceles triangle
(B) an obtuse triangle
(C) an equilateral triangle
(D) a right triangle

9. Angles of a triangle are in the ratio 2 : 4 : 3. The smallest angle of the triangle is 1M
(A) 60° (B) 40° (C) 80° (D) 20°

10. An exterior angle of a triangle is 100° and its two interior opposite angles are equal. Each of these equal angles is 1M
(A) 37^0
(B) 50^0
(C) 80^0
(D) 40^0

11. What in the area of an equilateral triangle with side 2 cm? 1M
(A) $\sqrt{6}cm^2$ (B) $\sqrt{3}cm^2$ (C) $\sqrt{8}cm^2$ (D) None of these

12. The sides of a triangle are 3 cm, 5 cm and 4 cm. What is its area? 1M
(A) $2\sqrt{3}cm^2$ (B) $4\sqrt{14}cm^2$ (C) $5\sqrt{12}cm^2$ (D) None of these

13. The area of a triangle is 150 cm^2 and its sides are in the ratio 3 : 4 : 5. What is its perimeter? 1M
(A) 10 cm (B) 30 cm (C) 45 cm (D) None of these

14. Graphically, the pair of equations 7x – y = 5; 21x – 3y = 10 represents two lines which are 1M
(A) intersecting at one point
(B) parallel
(C) intersecting at two points
(D) coincident

15. The graph of x = -2 is a line parallel to the 1M
(A) x-axis
(B) y-axis
(C) both x- and y-axis
(D) none of these

16. The pair of equations x = a and y = b graphically represents lines which are 1M
(A) parallel
(B) intersecting at (b, a)
(C) coincident
(D) intersecting at (a, b)

17. The distance of the point P(2, 3) from the x-axis is 1M
(A) 2
(B) 3
(C) 1
(D) 5

18. The distance of the point (α, β) from the origin is 1M
(A) α + β
(B) $\alpha^2 + \beta^2$
(C) $|\alpha| + |\beta|$
(D) Square root of $\alpha^2+\beta^2$

19. **Assertion (A):** The value of y is 3, if the distance between the points P (2, -3) and Q (10, y) is 10. 1M
Reason (R): Distance between two points is given by $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
(A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(B) Both assertion and reason are true and reason is not the correct explanation of Assertion.
(C) Assertion (A) is true but reason (R) is false.
(D) Assertion (A) is false but reason (R) is true.

20. **Assertion (A):** If the points A(6, 1), B(8, 2), C(9, 4) and D(p, 3) are the vertices of a parallelogram (in order), then p = 7. 1M

Mathematics

Reason (R): Diagonals of a parallelogram bisect each other, therefore midpoint of AC = midpoint of BD.

(A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

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

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

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

SECTION B

21. Classify the following numbers as rational or irrational with justification: (i) √196 (ii) 3√ 18. 2M

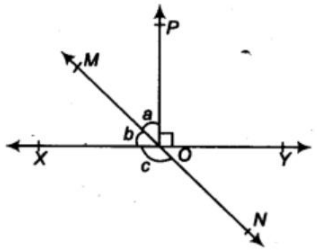
22. Find the value of a, if x – a is a factor of $x^3 - ax^2 + 2x + a - 1$. 2M

Or

Find the value of m, if $x + 1$ is a factor of

$$x^3 + mx^2 - 4x + 2m - 4.$$

23. In **Fig.**, lines **XY** and **MN** intersect at **O**. If **∠POY = 90°** and **a : b = 2 : 3**, find the value of **c**. 2M



24. The sides of a triangular plot are in the ratio of 6 : 7 : 8 and its perimeter is 420 m. Find its area. 2M

25. If points A (4, 3) and B (x, 5) are on the circle with centre O (2, 3), find the value of x. 2M

Or

If the diagonals of parallelogram $ABCD$ intersect at $O(3, 4)$, and the coordinates of $A(2, 2)$ and $C(x, 6)$ are given, find the value of x.

SECTION C

26. Find the value of a in the following: 3M

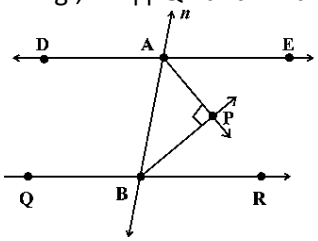
$$\frac{6}{3\sqrt{2} - 2\sqrt{3}} = 3\sqrt{2} - a\sqrt{3}$$

27. Find the zeroes of the polynomial: $p(x) = (x - 2)^2 - (x + 2)^2$. 3M

Or

Find zeroes of the polynomial $2x^2 + 10x + 12$.

28. In Fig., DE || QR and AP and BP are bisectors of ∠ EAB and ∠ RBA, respectively. Find ∠APB. 3M



29. Find the area of an isosceles triangle with two equal sides as 5 cm each and the third side as 8 cm. 3M

30. Solve the following pair of equations by substitution method: 7x – 15y = 2 and x + 2y = 3 3M

31. Prove that the points (7, 10), (-2,5) and (3,-4) are the vertices of an isosceles right triangle. 3M

SECTION D

32. Express 5M

$0.6 + 0.\overline{7} + 0.4\overline{7}$

in the form p/ q , where p and q are integers and q ≠ 0 .

or

Simplify the following using the laws of exponents. Express your final answer with positive exponents only.

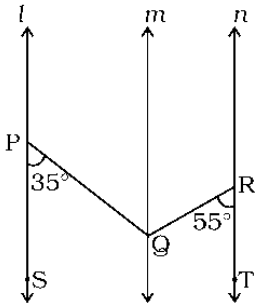
(a) $\frac{3^{-2} \times 9^2}{27^{-1}}$

(b) $\frac{a^{-5} b^4}{a^{-2} b^{-3}}$

(c) Evaluate: $\left(\frac{4}{7}\right)^{-2}$

33. Without finding the cubes, factorise $(x - 2y)^3 + (2y - 3z)^3 + (3z - x)^3$ 5M

34. In Fig., l ||m ||n. ∠ QPS = 35° and ∠ QRT = 55°. Find ∠PQR. 5M



Or

In the given figure, $\angle AOF$ and $\angle FOG$ form a linear pair. Also,

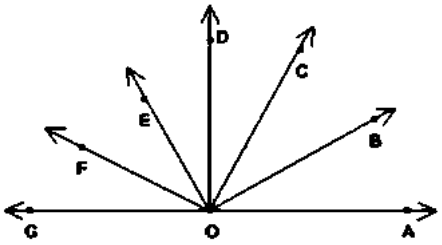
- $\angle EOB = 90°$
- $\angle FOC = 90°$
- $\angle DOC = 30°$
- $\angle FOG = 30°$
- $\angle AOB = 30°$

Using the above information, find the measures of:

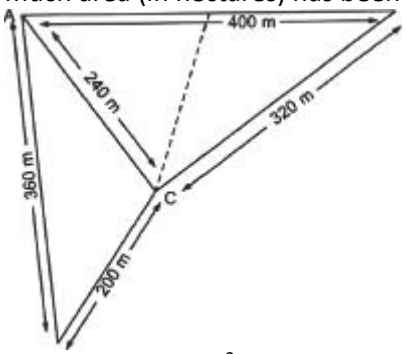
(a) $\angle FOE$

(b) $\angle COB$

(c) $\angle DOE$



35. A farmer has a triangular field with sides 240 m, 200 m and 360 m, where he grew wheat. In another triangular field with sides 240 m, 320 m and 400 m adjacent to the previous field, he wanted to grow potatoes and onions (see figure). He divided the field into two parts by joining the mid-point of the longest side to the opposite vertex and grew potatoes in one part and onions in the other part. How much area (in hectares) has been used for wheat, potatoes and onions? 5M



Now 10,000 m^2 = 1 hectares

SECTION E

36. As part of the **"Clean and Green School Initiative"**, students of a school planned to develop a triangular flower garden. The three sides of the garden measured **13 m, 14 m, and 15 m**. Before planting flowers, they measured the dimensions to calculate the area of the garden using Heron's Formula. 4M

Answer the following questions:

(i) Write the formula for finding the semi-perimeter of a triangle.

(ii) Find the semi-perimeter of the triangular garden.

(iii) Using Heron's Formula, find the area of the triangular garden.

(iv) If each flowering plant requires **4 m²** of space, how many plants can be planted in the garden?

37. Two straight roads, **AB** and **CD**, are parallel to each other. A pipeline **PQ** crosses both roads, acting as a transversal. At the point where the pipeline intersects road **AB**, one of the angles formed is 72°. 4M

Using the properties of parallel lines and a transversal, answer the following questions.
(a) Find the measure of the angle corresponding to the given $72°$angle. Give a reason.
(b) Find the measure of the angle that forms a linear pair with the given $72°$angle. State the property used.
(c) Find the measure of the alternate interior angle corresponding to the given $72°$angle. Explain your answer.
(d) (During inspection, an engineer measures the corresponding angle at the second intersection and finds it to be $75°$instead of $72°$.

1. Can the roads **AB** and **CD** still be parallel? Give a reason.
2. Which property of parallel lines and a transversal is violated in this situation?

38. A city administration is developing a **Smart City Emergency Response System**. Two emergency service centres are located at points **A(2, 3)** and **B(8, 11)** on the city's coordinate map. The control room needs to calculate the distance between these centres to plan the fastest emergency response. Answer the following questions. 4M

(a) Find the difference in the x-coordinates and the y-coordinates of points A and B.
(b) Substitute the values in the distance formula to find AB^2.
(c) Find the distance between the two emergency service centres.
(d) A third emergency service centre is planned at **C(2, 11)**.

1. Find the distances **AC** and **CB**.
2. Verify whether $\triangle ACB$is a right-angled triangle using the distance formula.

*****BEST OF LUCK********