SHAPING FUTURES. BUILDING LEGACIES

ST KABIR PUBLIC SCHOOL

SECTOR 26, CHANDIGARH, 160019

MID-TERM EXAMINATION (2025-26)

RUDRANSH S.

Class-IX -B

Subject-Mathematics (041)

Duration-3 Hours
Max. Marks - 80

General Instructions:

Read the following instructions very carefully and strictly follow them:

*(i) This question paper contains **38** questions. **All** questions are **compulsory.***

*(ii) This question Paper is divided into **five** Sections - **A, B, C, D** and **E.***

*(iii) In **Section A**, Questions no. **1** to **18** are multiple choice questions (MCQs) and questions number **19** and **20** are Assertion-Reason based questions of 1 mark each.*

*(iv) In **Section B**, Questions no. **21** to **25** are very short answer (VSA) type questions, carrying 2 marks.*

*(v) In **Section C**, Questions no. **26** to **31** are short answer (SA) type questions, carrying 3 marks each.*

*(vi) In **Section D**, Questions no. **32** to **35** are long answer (LA) type questions, carrying 5 marks each*

*(vii) In **Section E**, Questions no. **36** to **38** are case study-based questions carrying 4 marks each. Internal choice is provided in 2 marks questions in each case- study.*

(viii) There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Sections in Section C, 2 questions in Section D and 3 questions in Section E.

(ix) Draw neat diagrams wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.

*(x) Use of calculators is **not** allowed.*

SECTION – A

This section comprises multiple choice questions (MCQs) of 1 mark each.

Q1. If $5^{6x} = 125^2$, then x = (1)

(A) 2 (B) 3 (C) 1 (D) 4

Q2. The number of rational numbers between -2 and 0 is (1)

(A) finite (B) infinite (C) one (D) two

Q3. Which of the following is a polynomial? (1)

(A) $\frac{x^2}{2} - \frac{2}{x^2}$ (B) $\sqrt{2x} - 1$ (C) $x^2 + \frac{3x^{\frac{1}{2}}}{\sqrt{x}}$ (D) $\frac{x-1}{x+1}$

Q4. The factorisation of $4x^2 + 8x + 3$ is (1)

(A) $(x + 1)(x + 3)$

(B) $(2x + 1)(2x + 3)$

(C) $(2x + 2)(2x + 5)$

(D) $(2x - 1)(2x - 3)$

$4x^2 + 6x + 2x + 3$

$2x(2x+1) + 3(2x+1)$

$= (2x+3)(2x+1)$

Q5. The coefficient of x in the expansion of $(3x + 2)^2$?
(A) 10 (B) 11 (C) 12 (D) 6

Q6. Abscissa of all the points on the $x -$ axis is:
(A) 0 (B) 1 (C) 2 (D) any number

Q7. If the coordinates of the two points are $P(-2,3)$ and $Q(-3,5)$, then (abscissa of P) − (abscissa of Q) is (1)
(A) -5 (B) 1 (C) -1 (D) -2

Q8. If the perpendicular distance of a point P from the $x -$ axis is 5 units and the foot of the perpendicular lies on the negative direction of $x -$ axis, then the point P has (1)
(A) x −coordinate= -5 (B) y −coordinate = 5 only
(C) y −coordinate= -5 only (D) y −coordinate = 5 or -5

Q9. If (2,0) is a solution of the linear equation $2x + 3y = k$, then the value of k is (1)
(A) 4 (B) 6 (C) 5 (D) 2

Q10. The equation of $x -$ axis is of the form (1)
(A) $x = 0$ (B) $y = 0$
(C) $x + y = 0$ (D) $x = y$

Q11. The graph of $y = x$ passes through the point: (1)
(A) $\left(\frac{3}{2}, -\frac{3}{2}\right)$ (B) $\left(0, \frac{3}{2}\right)$ (C) (1,1) (D) $\left(-\frac{1}{2}, \frac{1}{2}\right)$

Q12. The area of a triangle is equal to the area of a rectangle. The area of the rectangle is equal to the area of a parallelogram. What is the relation between the area of the triangle and the area of the parallelogram? (1)
(A) Equal (B) Less than
(C) More than (D) Double

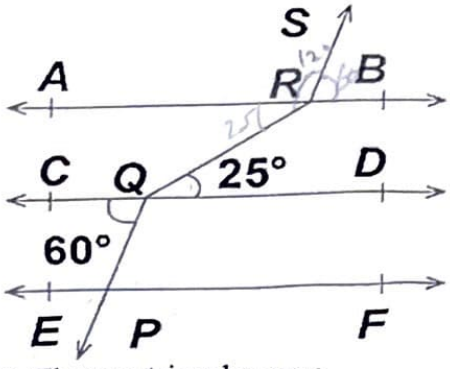
Q13. Balan says, "The measure of all right angles cannot be equal as their arms can be of different lengths". Why is Balan's statement not true? (1)
(A) The measure of an angle depends upon its orientation.
(B) The measure of an angle depends upon the instrument used to measure it.
(C) The measure of an angle depends on the length of its angle arms.
(D) The measure of an angle depends upon the rotation of one arm on another.

Q14. Euclid belongs to which country? (1)
(A) Babylonia (B) Egypt
(C) Greece (D) India

Q15. Two angles measure $(30° - a)$ and $(125° + 2a)$. If each one is the supplement of the other, then the value of a is. (1)
(A) 55° (B) 25° (C) 75° (D) 85°

Q16. The angles of a triangle are in the ratio 5: 3: 7. The triangle is: (1)
(A) an acute angled triangle (B) an obtuse angled triangle
(C) a right triangle (D) an isosceles triangle

In the given figure, if AB ∥ CD ∥ EF, PQ ∥ RS, ∠RQD = 25° and ∠CQP = 60°, then ∠QRS is equal to



(A) 85° (B) 135°
(C) 145° (D) 110°

Q18. In triangles ABC and PQR, AB = AC, ∠C = ∠P and ∠B = ∠Q. The two triangles are :
(A) isosceles but not congruent. (B) isosceles and congruent.
(C) congruent but not isosceles. (D) neither congruent nor isosceles.

Questions number **19** and **20** are Assertion and Reason based questions carrying 1 mark each. Choose the correct option. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below:

(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 (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.

Q19. **Assertion (A):** There are infinite number of lines passing through (5,6).

Reason (R): A linear equation in two variables has infinitely many solutions

Q20. **Assertion (A):** A straight line which intersects two or more given lines at distinct points is called a transversal of the given lines.

Reason (R): Two lines are said to be intersecting when the perpendicular distance between the two lines is not same everywhere. They meet at one point.

SECTION – B

This section comprises very short answer (VSA) type questions of 2 marks each.

Q21. Represent $0.\overline{239}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

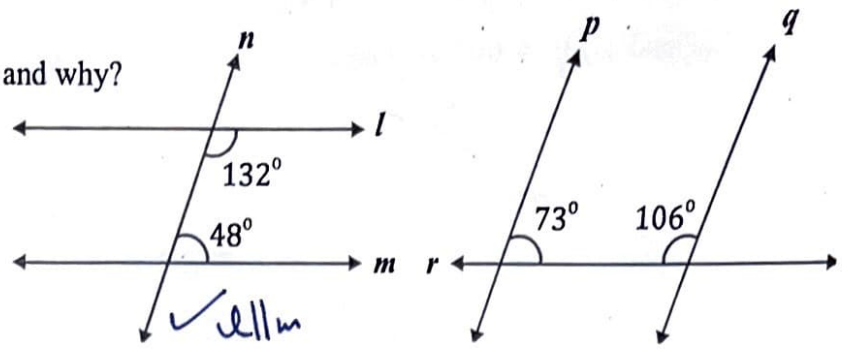
Q22. (A) Calculate the value of $\frac{77^3+23^3}{77^2-77.23+23^2}$.

OR

(B) Find zeroes of the polynomial $p(x) = (x-2)^2 - (x+2)^2$.

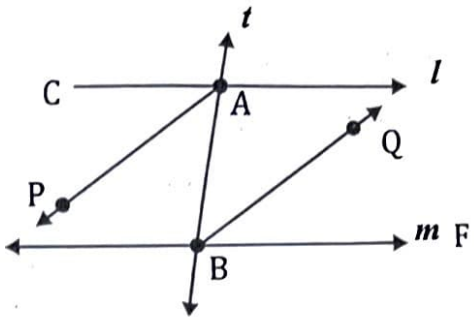
Q23. How many planes can be made to pass through:
(i) Three collinear points.
(ii) Three non-collinear points.

Q24. (A)In given figure,
which of the two lines are parallel and why?



OR

(B)If in given figure, bisectors AP and BQ of the alternate interior angles are parallel, then show that l ∥ m.



Q25. In ΔPQR, PE is the perpendicular bisector of ~~QPR~~ QR, then prove that PQ = PR. (2)

SECTION – C

This section comprises of short answer (SA) type questions of 3 marks each.

Q26. (A) If $2^{3x} \times 4^{x} = (8)^{\frac{1}{3}} \times (64)^{\frac{1}{6}}$, then find the value of x. (3)

OR

(B) Find the product of $5\sqrt{3}(3+\sqrt{3})(5+\sqrt{3})$.

Q27. If $x + \sqrt{y} = (2-\sqrt{3})^2$, then find the value of x and y. (3)

Q28. (A)Prove that $(a^2-b^2)^3 + (b^2-c^2)^3 + (c^2-a^2)^3 = 3(a+b)(b+c)(c+a)(a-b)(b-c)(c-a)$. (3)

OR

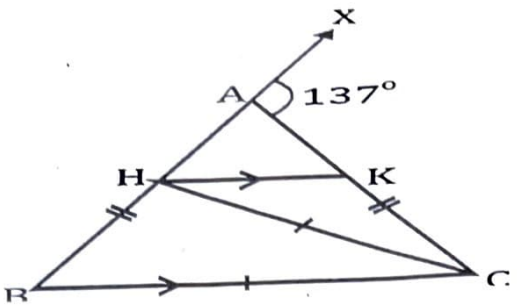
(B) If $x + y + z = 12$ and $x^2 + y^2 + z^2 = 50$, then find $xy + yz + zx$ and $x^3 + y^3 + z^3 - 3xyz$.

Q29. Draw the graphs of $y = x + 1$ and $x + y = 5$ on the same Cartesian plane. Shade the triangle formed by these graphs and Y – axis and also find its area. (3)

Q30. It is known that if $a + b = 10$, then $a + b - c = 10 - c$. Write the Euclid's axiom that best illustrates this statement. Also, give two more axioms other than the axiom used in the above situation. (3)

n figure, $AB = AC, CH = CB$ and $HK||BC$. (3)

If $\angle CAX = 137°$, then find $\angle CHK$.



SECTION – D

This section comprises of long answer (LA) type questions of 5 marks each.

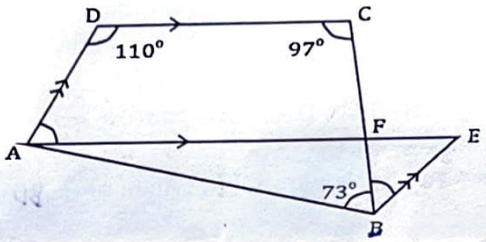
Q32. (A) Rationalise the denominator of $\frac{1}{(\sqrt{2}+\sqrt{3})-\sqrt{4}}$. (5)

OR

(B) Prove that $\frac{1}{3+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{3}} + \frac{1}{\sqrt{3}+1} = 1.$

Q33. Plot the points $A(1,-1)$ and $B(4,5)$. Draw a line segment joining these points. Write the coordinate of a point on this line segment between the points A and B. Extend this line segment and write the co-ordinates of a point on this line which lies outside the line segment AB. (5)

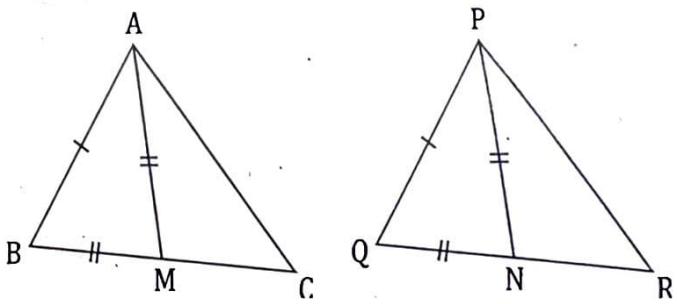
Q34. In the figure, ABCD is a quadrilateral in which $\angle ABC = 73°$, $\angle C = 97°$ and $\angle D = 110°$. If $AE||DC$ and $BE||AD$ and AE intersects BC at F, find the measure of $\angle EBC$. (5)



Q35. (A) Two sides AB and BC andmedian AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of ΔPQR (see figure given). Show that: (5)

(i) $\Delta ABM \cong \Delta PQN$

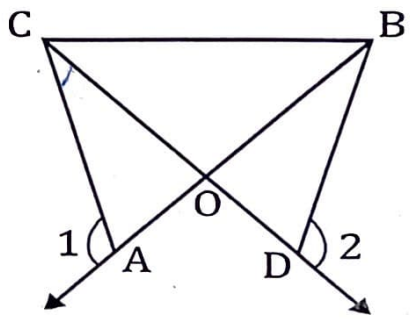
(ii) $\Delta ABC \cong \Delta PQR$



OR

(B) In figure, $OA = OD$ and $\angle 1 = \angle 2$.

Prove that ΔOCB is an Isosceles triangle



SECTION – E

This section comprises 3 case study-based questions of 4 marks each.

Q36. Beti Bachao, Beti Padhao (BBBP) is a personal campaign of the Government of India that aims to generate awareness and improve the efficiency of welfare services intended for girls.
In a school, a group of $(x + y)$ teachers, $(x^2 + y^2)$ girls and $(x^3 + y^3)$
boys organised a campaign on Beti Bachao, Beti Padhao.

(i) Which mathematical concept is suitable in this case study? Linear eqn in 2 variables. **(1)**

(ii) What is the degree of a constant polynomial? 1 **(1)**

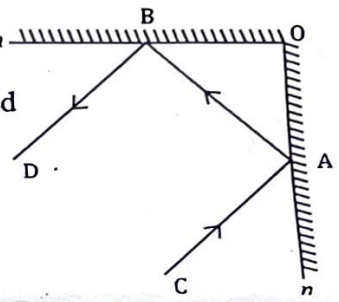
(iii) (A) If $x + y = 3$ and $xy = 2$ find $x^2 + y^2$ = 5 **(2)**

OR

(B) If $x + \frac{1}{x} = 3$, find $x^3 + \frac{1}{x^3}$.

Q37. A plane mirror is a mirror with a flat reflective surface.

An incident ray is a ray of light that strikes a surface. The reflected ray corresponding to a given incident ray, is the ray that represents the light reflected by the surface.
In figure, m and n are two plane mirrors perpendicular to each other.



(i) Incident ray CA is parallel to which ray? BD **(1)**

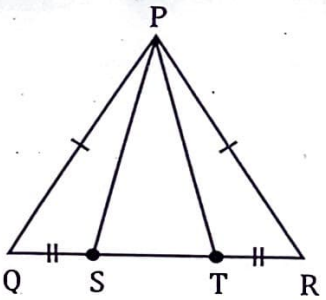
(ii) (A) Find the value of $\angle DBA + \angle BAC$? **(2)**

OR

(B) If $BO = 3$ cm, $AB = 5$ cm, then what will be the value of AO.

(iii) Which property of parallel lines has been used here? **(1)**

Q38. A children's park is in the shape of an isosceles triangle said PQR with $PQ = PR$, S and T are points on QR such that $QT = RS$.



(i) Which rule is applied to prove that congruency of ΔPQS and ΔPRT. SAS

(ii) In RHS rule, what does 'H' stands for? Hypotenuse. **(1)**

(iii) (A) If $\angle QPR = 80°$. find $\angle PQR$? 50° **(1)**

OR

(B) If two sides and an angle of one triangle are equal to two sides and an angle of another triangle, then the two triangles must be congruent". Is the statement true? Why? **(2)**

14/8/25