R. D. RAJPAL SCHOOL
SESSION 2025-26
MID-TERM EXAMINATION

CLASS: IX | **SUBJECT: MATHS (SET-B)**
TIME ALLOWED: 3 HOURS | **MAXIMUM MARKS: 80**
NO. OF PAGES: 6

General Instructions:

Read the following instructions carefully and follow them:

1. This question paper contains 38 questions.
2. This question paper is divided into 5 Sections A, B, C, D and E.
3. In Section-A, Question numbers 1 – 10 are multiple choice questions (MCQs), question numbers 11 and 12 are Assertion – Reason based question of 1 mark and question numbers 13 – 20 are of 01 mark each.
4. In Section-B, Question numbers 21 – 25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section-C, Question numbers 26 – 31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section-D, Question numbers 32 – 35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section-E, Question numbers 36 - 38 are case-study based questions, carrying 04 marks each.
8. All questions are compulsory.

SECTION-A
Section A consists of 20 questions of 1 mark each

Q1. The degree of polynomial $p(x) = \frac{x^3+2x^2+6}{7} - \frac{5}{2}x^6$ is: 1

(i) 1 (ii) 2 (iii) 4 (iv) 6

Q2. If $(3, -2)$ is a solution of the linear equation $3x - ky = 1$, then the value of k is: 1

(i) 3 (ii) -2 (iii) 1 (iv) -4

Q3. The coordinates of the reflection of the point $(5, -5)$ in x-axis are: 1

(i) $(-5, -5)$ (ii) $(5, 5)$ (iii) $(0, 5)$ (iv) $(0, -5)$

Q4. If $9 + (-3) + (-6) = 0$, then the value of $(9)^3 + (-3)^3 + (-6)^3$ is: 1

(i) 162 (ii) 486 (iii) 180 (iv) -986

Q5. The value of x, if $(5)^{x-3}.(3)^{2x-8} = 225$. 1

(i) 2 (ii) 3 (iii) 5 (iv) 7

Q6. If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 2:3, then the value of the smaller angle is: 1

(i) $100°$ (ii) $50°$ (iii) $72°$ (iv) $80°$

Q7. The value of $(\frac{1}{27})^{\frac{-2}{3}}$ is: 1

(i) $\frac{1}{9}$ (ii) 9 (iii) 3 (iv) $\frac{1}{3}$

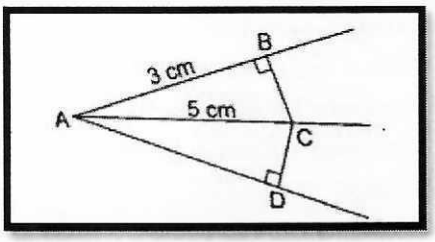
Q8. In two triangles DEF and XYZ, $\angle D = 45°, \angle E = 65°, \angle X = 65°$ and DE = XZ, then: 1

(i) $\Delta DEF \cong \Delta XYZ$ (ii) $\Delta DEF \cong \Delta ZXY$ (iii) $\Delta DEF \cong \Delta YZX$ (iv) $\Delta DEF \cong \Delta XZY$

Q9. The zeroes of the polynomial $p(x) = x^2 + 7x + 12$ are: 1

(i) $-3, -4$ (ii) $3, -4$ (iii) $-3, 4$ (iv) $3, 4$

Q10. In the given figure, find CD: 1



(i) 2 cm (ii) 3 cm (iii) 4 cm (iv) 5 cm

Q11. Assertion (A): Mirror image of the point on the $(9, -8)$ in x-axis is $(9, 8)$.
Reason (R): The coordinates of the point which lies on y-axis at a distance of 4 units in negative direction of y-axis is $(6,5)$. 1

(i) Both A and R are true and R is the correct explanation of A
(ii) Both A and R are true but R is not the correct explanation of A
(iii) A is true but R is false
(iv) A is false but R is true

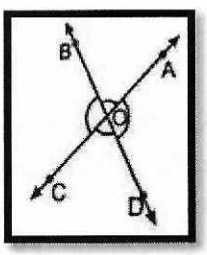
Q12. Assertion (A): $g(x) = x + 2$ is a factor of $p(x) = x^4 - x^2 - 12$.
Reason (R): If $x + a$ is a factor of polynomial $p(x)$, then $p(-a) = 0$. 1

(i) Both A and R are true and R is the correct explanation of A
(ii) Both A and R are true but R is not the correct explanation of A
(iii) A is true but R is false
(iv) A is false but R is true

Q13. Express $1.\overline{21}$ in the form of $\frac{p}{q}$ where p and q are integers and $q \neq 0$. 1

Q14. State Euclid's any one axiom. 1

Q15. In lines AC and BD intersect at point O such that $\angle AOB : \angle BOC = 2:3$ as shown in the figure, find $\angle COD$. 1



Q16. Expand $(\frac{3}{2}x + 1)^3$. 1

Q17. The auto-rickshaw fare in a city is charged as ₹ 8 for the first kilometre, and for the subsequent distance it is ₹ 4 per km. Taking the distance covered as x km and the total fare as ₹ y, write a linear equation for this information. 1

Q18. Find four rational numbers between $\frac{-1}{3}$ and $\frac{3}{4}$. 1

Q19. If the area of an equilateral triangle is $16\sqrt{3}\ cm^2$, then find its perimeter. 1

Q20. Write the coordinates of point whose perpendicular distance from x-axis is 7 units and perpendicular distance from y-axis is 2 units and the point lies in II quadrant. 1

SECTION–B

Section B consists of 5 questions of 2 marks each

Q21. Find any four different solutions of the equation $4x + 3y = 20$. 2

Q22. Show that $(\frac{x^a}{x^b})^{a^2+ab+b^2}\ (\frac{x^b}{x^c})^{b^2+bc+c^2}\ (\frac{x^c}{x^a})^{c^2+ac+a^2} = 1$. 2

Q23. In the given figure, if $AC = BD$, then prove that $AB = CD$. [Write axiom also.] 2

Q24. If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel. 2

Q25. Represent $\sqrt{6.3}$ on the number line. (Do not write steps of construction) 2

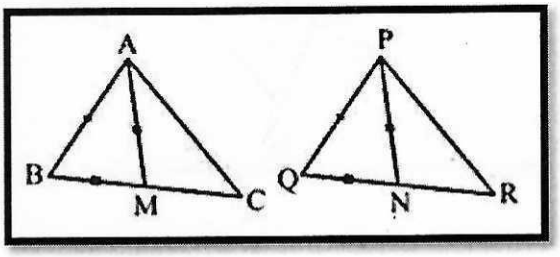
SECTION–C

Section C consists of 6 questions of 3 marks each

Q26. Points $A(5,3), B(-2,3)$ and $D(5,-4)$. Plot these points and hence find the coordinates of the fourth vertex. 3

Q27. The perimeter of a triangular field is 540 cm and its sides are in the ratio 12: 17: 25. Find the length of the perpendicular from the opposite vertex to the side where length is longest. 3

Q28. Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of ΔPQR. Show that: 3

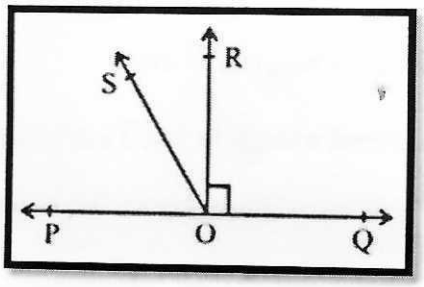


(i) $\Delta ABM \cong \Delta PQN$

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

Q29. Simplify: $(2x + p - q)^2 - (2x - p + q)^2$ 3

Q30. In the given figure, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$. 3



Q31. Find the value of $\frac{4}{(1000)^{\frac{-2}{3}}} + \frac{3}{(256)^{\frac{-3}{4}}} + \frac{2}{(729)^{\frac{-1}{6}}}$ 3

SECTION–D

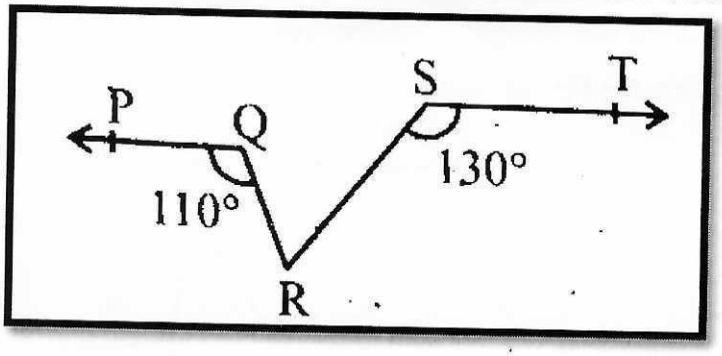
Section D consists of 4 questions of 5 marks each

Q32. Simplify: $\frac{2\sqrt{6}}{\sqrt{2}+\sqrt{3}} + \frac{6\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{8\sqrt{3}}{\sqrt{6}+\sqrt{2}}$ 5

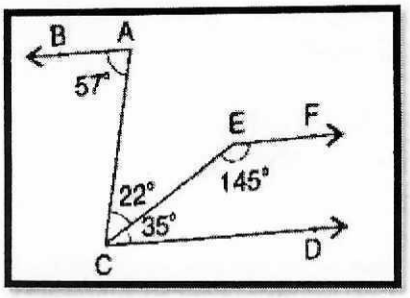
Q33. In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that $DM = CM$. Point D is joined to point B. 5
Show that:
(i) $\Delta AMC \cong \Delta BMD$
(ii) $\angle DBC$ is a right angle.
(iii) $\Delta DBC \cong \Delta ACB$
(iv) $CM = \frac{1}{2}AB$

Q34. (i) If $x^2 + \frac{1}{x^2} = 98$. Find the value of $x^3 + \frac{1}{x^3}$. 3
(ii) Factorize: $27y^3 + 125z^3$ 2

Q35. (i) In the given figure if $PQ \parallel ST, \angle PQR = 110°$ and $\angle RST = 130°$. Find $\angle QRS$. 3



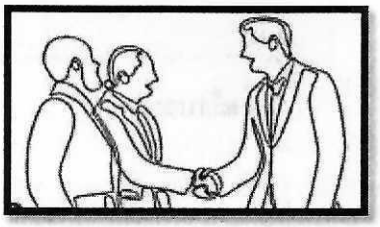
(ii) In the given figure, show that $AB \parallel EF$. 2



SECTION-E

Section E consists of 3 case-based questions of 4 marks each

Q36. Arjun, Mani and Kabir came together to launch a new initiative under Young Entrepreneurs Launchpad Program. Their combined investment (in ₹) is represented by the polynomial $p(y) = 2y^3 + y^2 - 2y - 1$. The factors of this polynomial represent each partner's individual share in the business.



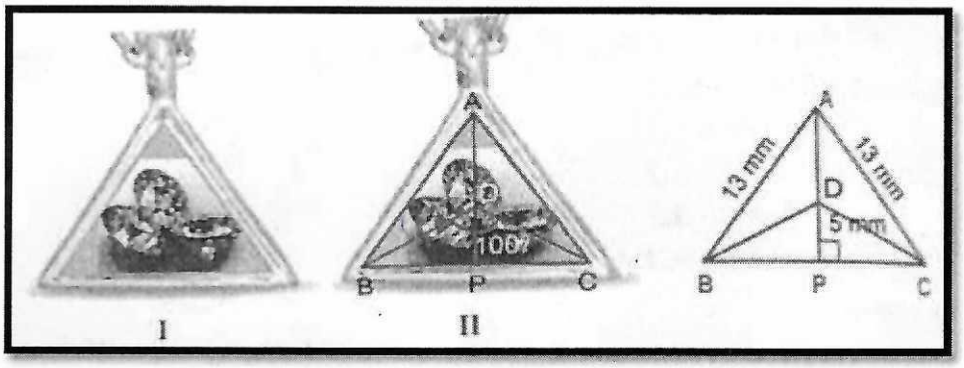
Based on this information, answer the following questions:

(i) Find the value of $p(10) - p(0)$. 1

(ii) If $y = 60$, then find the total money invested by Arjun, Mani and Kabir. 1

(iii) Find the shares invested by Arjun, Mani and Kabir separately. 2

Q37. Look at the petite pendant giving dainty dazzle, crafted in white gold. It is triangular in shape studded with three sparkling diamonds. The sketch originally drawn by the artist designer and its details are for your reference to answer the given questions.
ΔABC *and* ΔDBC are isosceles triangle, with $AB = AC$ *and* $DB = DC$.



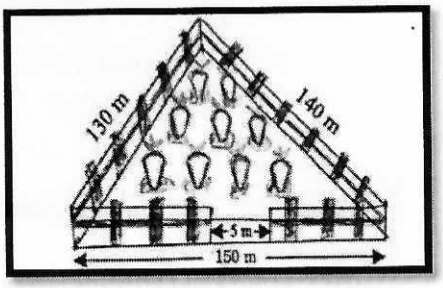
Based on this information, answer the following questions:

(i) Show that $\Delta ABD \cong \Delta ACD$. 1

(ii) If $\angle BDC = 100°$, then find the measure of $\angle DBC$. 1

(iii) If the equal sides AB and AC of given pendant are 13 mm and its height from A to BC is 5 mm, the find the length of BC. 2

Q38. A hardworking farmer, Ramesh owned a uniquely shaped triangular field with corners marked as A, B, and C. The sides of the field measured 130 meters, 140 meters, and 150 meters. Wanting to protect his land and crops from animals and trespassers, the farmer decided to build a strong fence all around the field. However, he cleverly left a 5-meter-wide space open on one side to install a gate for easy access. Once the fencing was complete, the farmer began cultivating fresh, healthy carrots in the well-protected field, ready for a season of harvest.



(i) Find the total length of the wire needed. 2

(ii) Find the cost of fencing the field with barbed wire at the rate of ₹ 20 per m. 1

(iii) Find the total area of the field. 1