MID TERM EXAMINATION (2025-26)
MATHEMATICS (041) – IX – A

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Date: September 10, 2025

Maximum Marks: 80

Time Allotted: 3 Hours

General Instructions:

1. This 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 Answer (VSA)-type questions of 2 marks each.

4. Section C has 6 Short Answer (SA)-type questions of 3 marks each.

5. Section D has 4 Long Answer (LA)-type questions of 5 marks each.

6. Section E has 3 source based/case based/passage based/integrated units of assessment (4 marks each) with sub parts.

SECTION A

Section A consists of 20 questions of 1 mark each.

1. If x, y and z are positive real numbers, then $\sqrt{x^{-1}y}\,.\sqrt{y^{-1}z}\,.\sqrt{z^{-1}x}$ is equal to

(a) 1 (b) xyz (c) $\sqrt{xyz}$ (d) $\frac{1}{xyz}$

2. If $p(x) = x^2 - 2\sqrt{2}\,x+1$, then $p(2\sqrt{2})$ is equal to

(a) 0 (b) 1 (c) $4\sqrt{2}$ (d) $8\sqrt{2}+1$

3. Point (0, 3) and (0, -7) lie

(a) on the x-axis. (b) in the first quadrant. (c) on the y-axis. (d) in the second quadrant.

4. Find the value of y for which x=-2 is a solution of the linear equation 5x-3y=5

(a) 5 (b) -5 (c) $\frac{-5}{3}$ (d) $\frac{5}{3}$

5. Which of the following statements are true?

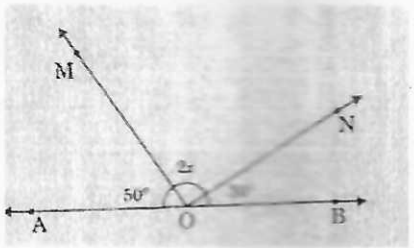
(a) Only one line can pass through a single point.

(b) There is an infinite number of lines that pass through two distinct points.

(c) A terminated line can be produced indefinitely on both sides

(d) If two circles are equal, then their radii are unequal.

6. If AOB is a line. The value of x is



(a) 20° (b) 30° (c) 45° (d) 50°

7. In ΔABC, AB=AC & $\angle B=50$. Then $\angle C$ is equal to-

(a) 40^0 (b) 50^0 (c) 80^0 (d) 130^0

8. If the area of equilateral triangle is $16\sqrt{3}$ cm^2, then the perimeter of triangle is:

(a) 48 cm (b) 24 cm (c) 60 cm (d) 50 cm

9. Solve $5^{x+1} = (\sqrt{25})^{3x-1}$

(a) 1 (b) 2 (c) ½ (d) 3

10. If $(3x-4)(5x+7) = 15x^2 - kx - 28$, then the value of k is

(a) 0 (b) 1 (c) 2 (d) -1

11. Coordinates of a point which is 8 units away from the x axis and lies on the negative direction of the y axis are

(a) (-8, 0) (b) (8, 0) (c) (0, -8) (d) (0, 8)

12. The equation $2x = 3$ in the form of an equation in two variables can be written as:

(a) $2x + 0y = 3$ (b) $2x + y = 3$ (c) $2x + 10y = 3$ (d) $2x + y + 3 = 0$

13. It is known that if $x + y = 10$ then $x + y + z = 10 + z$. Euclid's axiom that illustrates this statement is

(a) First Axiom (b) Second Axiom (c) Third axiom (d) Fourth Axiom

14. An exterior angle of a triangle is 105^0 and its two opposite interior angles are equal. Each of these angles is

(a) 37.5^0 (b) 52.5^0 (c) 72.5^0 (d) 75^0

15. In triangles ABC & PQR, if $\angle A = \angle R$, $\angle B = \angle P$ and AB=RP, then which of the following congruency conditions applies-

(a) SSS (b) RHS (c) ASA (d) SAS

16. The sides of a triangle are 12cm, 16 cm and 20cm. Its area is

(a) 48 cm^2 (b) 96 cm^2 (c) 120 cm^2 (d) 160 cm^2

17. If two angles on the same side of a transversal intersecting two parallel lines are in the ratio 2:3, then the greater of the two angles is:

(a) 54^0 (b) 108^0 (c) 120^0 (d) 136^0

18. The linear equation $3x-11y=10$ has:

(a) Unique solution (b) Two solutions (c) Infinitely many solutions (d) No solutions

DIRECTION: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(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.

19. Assertion (A): 6.527 is a terminating decimal number.

Reason (R): Any decimal number is said to be a recurring decimal, if sets of digits repeated periodically.

20. Assertion (A): The degree of the polynomial $(x-2)(x-3)(x-4)$ is 4.

Reason (R): The number of zeroes of a polynomial is the degree of that polynomial.

Section B

Section B consists of 5 questions of 2 mark each.

21. Using suitable identity, Evaluate 99×101.

OR

If $(x-2)$ is a divisor of $p(x) = 3x^2-kx+10$, find the value of k.

22. State Euclid's fifth axiom.

23. Write the coordinates of a point:

(a) above x-axis lying on y-axis at a distance of 5 units from origin.

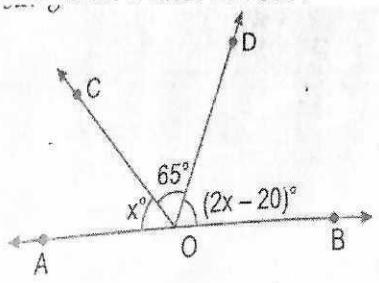
(b) below x-axis lying on y-axis at a distance of 3 units from origin.

(c) lying on x-axis to the right of origin at a distance of 5 units.

(d) lying on x-axis to the left of origin at a distance of 2 units.

24. If $(2k-3, k+2)$ is a solution of the equation $2x+3y+15 = 0$, then find the value of k.

25. In the given figure, AOB is a straight line. Find $\angle AOC$ and $\angle BOD$:



SECTION- C

Section C consists of 6 questions of 3 mark each.

26. The perimeter of a triangle is 50 cm. One side of a triangle is 4 cm longer than the smaller side and the third side is 6cm less than twice the smaller side. Find the area of the triangle.

27. Represent $\sqrt{3}$ on the number line.

28. Express in the lowest form $\frac{x^2+7x+12}{x^2+2x-3}$

OR

If $x^2+\frac{1}{x^2}=7$, find the value of $x^3+\frac{1}{x^3}$

29. In the Figure, if AB || CD, EF ⊥ CD and ∠GED = 126°, find ∠AGE, ∠GEF and ∠FGE.

30. Without plotting the points find the quadrant in which they will lie, if

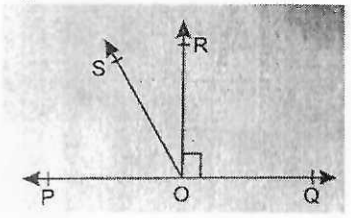
(i) ordinate is 5 while abscissa is – 3
(ii) abscissa is – 5 while ordinate is – 3
(iii) ordinate is 5 while abscissa is 3

31. BE and CF are two equal altitudes of a triangle ABC. Show that the ΔABC is an isosceles triangle.

SECTION- D

Section D consists of 4 questions of 5 marks each.

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



33. (a) Find the value of a and b if $\frac{\sqrt{7}-1}{\sqrt{7}+1}-\frac{\sqrt{7}+1}{\sqrt{7}-1}=a+b\sqrt{7}$ (2)

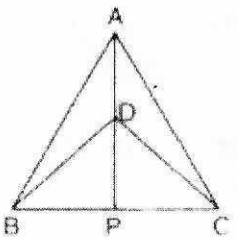
(b) Simplify $\left[5\left(8^{\frac{1}{3}}+27^{\frac{1}{3}}\right)^3\right]^{\frac{1}{4}}$ (3)

34. (a) If a+b+c=12 and ab+bc+ca=22 then find the value of $a^2+b^2+c^2$ (2)

(b) Factorise: $3a^7b-24a^4b^4$ (3)

35. Δ ABC and Δ DBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC. If AD is extended to intersect BC at P, show that

(i) Δ ABD ≅ Δ ACD
(ii) Δ ABP ≅ Δ ACP
(iii) AP bisects ∠A as well as ∠D.



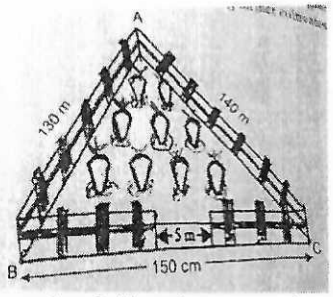
OR

Show that if two isosceles triangles have a common base, the line joining their vertices bisects the base at right angles.

SECTION-E Case Based Question

Section E consists of 3 questions of 4 marks each.

36. A triangular field has vertices A, B, and C. The lengths of the sides are 130 m, 140 m, and 150 m. The farmer wants to fence his field all around, leaving a space 5 m wide, with a gate on one side. The cost of fencing it with barbed wire is Rs. 20 per meter. After fencing, farmer cultivates carrot in the field.



Based on the above information, answer the following questions:

(i) Find the semi perimeter of the triangular field.

(ii) Find the length of the wire needed to fence the field.

(iii) Find the total area of the field.

OR

Find the cost of fencing the field.

37. Anil went to buy some vegetables, he bought 'x' kgs. of tomato and 'y' kgs. of potato. The total cost of vegetables comes out to be of Rs. 200. Now if the cost of 1 kg of tomato is Rs. 50 and 1 kg of potato is Rs. 20, then answer the following questions.

(i) Write the linear equation represent the total cost.

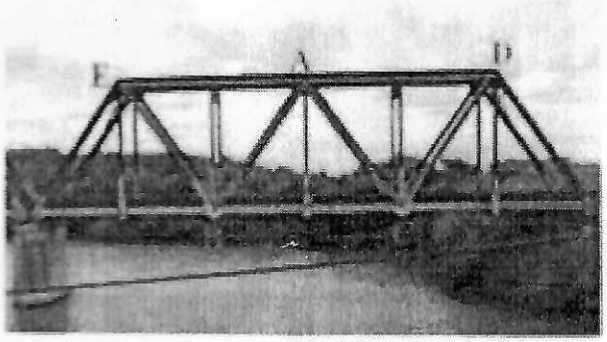
(ii) If Anil bought 'x' kgs of tomato and 2.5 kgs. of potato, then find the value of 'x'.

(iii) If Anil bought '2' kgs of tomato and 'y' kgs of potato, then find the value of 'y'.

OR

Using variables x and y, write a linear equation whose solution is $(z,-z)$.

38. Truss bridges are formed with a structure of connected elements that form triangular structures to make up the bridge. Trusses are the triangles that connect to the top and bottom cord and two end posts. You can see that there are some triangular shapes are shown in the picture given alongside and these are represented as $\triangle ABC$, $\triangle CAD$, and $\triangle BEA$.



Based on the above information, answer the following questions:

(i) If AB=CD and AD=CB, then prove $\triangle ABC \cong \triangle CDA$

(ii) If AB=7.5 m, AC=4.5 m and BC=5 m. Find the perimeter of $\triangle ACD$.

(iii) If $\triangle ABC \cong \triangle CDA$, AB=5 m, $\angle B = 40^\circ$ and $\angle A = 80^\circ$, then find the length of CD and $\angle CAD$.

OR

In $\triangle ABC$, if AB= AC, $\angle ABC = 50^0$ and $\triangle ABC \cong \triangle CDA$, find $\angle CAD$ and $\angle ACD$.