PRERNA EDUCATION
SAMPLE PAPER 2018
CLASS – IX
MATHEMATICS

Time: 3 hours **Max. Marks: 90**

General Instructions:

(i) All questions are **compulsory**.

(ii) The question paper consists of **31** questions divided into four **sections A, B, C** and **D**. **Section-A** comprises of **4** questions of **1 mark** each; **Section-B** comprises of **6** questions of **2 marks** each; **Section-C** comprises of **10** questions of **3 marks** each and **Section-D** comprises of **11** questions of **4 marks** each.

SECTION–A

1. Express $0.\overline{35}$ as a rational number in the form p/q, where p and q are integers and q ≠ o.
2. Without actual calculating the cubes, find the value of $(-28)^3 + (9)^3 + (19)^3$.
3. The angles of a triangle are in the ratio 2 : 3 : 7. Find the measure of the smallest angle.
4. Find the side of an equilateral triangle, whose area is $196\sqrt{3}$ cm^2.

SECTION–B

5. Find the remainder when $x3 – ax2 + 6x – a$ is divided by $x – a$.
6. Prove that the sum of angles of a triangle is equal to 180^0.
7. Evaluate 105 X 95, using suitable identity.
8. In Δ ABC, AD is the perpendicular bisector of BC. Show that Δ ABC is an isosceles triangle in which AB = AC.
9. Find the area of a triangle when two sides are 24cm and 10 cm and the perimeter of the triangle is 62 cm.
10. Write the coordinates of the vertices of a rectangle whose length and breadth are 4 units and 3 units respectively has one vertex at the origin, the longer side is on the *x*-axis and one of the vertices lies in the IVquadrant. Also find its area.

SECTION– C

11. Find the value of a and b, when $a + b\sqrt{15} = \dfrac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$
12. Factorize: $2y^3 + y^2 - 2y - 1$.
13. Represent $\sqrt{9.3}$
14. ABC is an isosceles triangle in which AB = AC. Side BA is produced to D, such that AD = AB.Show that ∠ BCD is a right angle.
15. Plot the points A(- 2, - 2), B(6, 0), C(0, 4) and D (- 3, 2) on the graph paper. Draw figure ABCD and write in which quadrant A and D lie.

16. In an isosceles triangle ABC with AB = AC, D and E are points on BC such that BE = CD. Show that AD = AE.
17. A field is in the shape of a trapezium, whose parallel sides are 25 m and 10 m. The non parallel sides are 14 m and 13 m. Find the area of the field.
18. Divide p(x) by g(x), where $p(x) = x + 3x^2 - 1$ and $g(x) = 1 + x$.
19. POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$.
20. Prove that the angles opposite to equal sides of an isosceles triangle are equal.

SECTION– D

21. If the polynomials $ax^3 + 4x^2 + 3x - 4$ and $x3 - 4x + a$ leave the same remainder when divided by $x - 3$, find the value of a.
22. Prove that the angle between internal bisector of one base angle and the external bisector of the other base angle of a triangle is equal to one – half of the vertical angle.
23. Verify that $x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x + y + z)[(x - y)^2 + (y - z)^2 + (z - x)^2]$
24. Factorise each of the following:
    a. $2x^2 + y^2 + 8z^2 - 2\sqrt{2}xy + 4\sqrt{2}yz - 8xz$ b. $27 - 125a^3 - 135a + 225a^2$
25. In right triangle ABC, $\angle C = 90$, M is midpoint 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. Show that (i) $\Delta AMC \cong \Delta BMD$ (ii) $\angle DBC = \angle ACB$
26. Simplify : $\frac{(a^2-b^2)^3+(b^2-c^2)^3+(c^2-c^2)^3}{(a-b)^3+(b-c)^3+(c-b)^3}$.
27. ABC is an isosceles triangle in which AB = AC.Side BA is produced to D, such that AD = AB. Show that $\angle BCD$ is a right angle.
28. If $a^2 + b^2 + c^2 = 250$ and $ab + bc + ca = 3$, find $a + b + c$.
29. POQ is a line, ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$
30. Show that : $\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} = 5$
31. AB and CD are respectively the smallest andlongest sides of a quadrilateral ABCD. Show that $\angle A > \angle C$ and $\angle B > \angle D$.