Question 1 to 10 carry 1 mark each. Each question has four alternate answers of which only one is correct. Choose the correct answer.

AI **1.** Which of the following is not equal $\left[\left(\dfrac{5}{6}\right)^{\frac{1}{5}}\right]^{-\frac{1}{6}}$?

(a) $\left(\dfrac{5}{6}\right)^{\frac{1}{5}-\frac{1}{6}}$

(b) $\left[\left(\dfrac{5}{6}\right)^{\frac{1}{5}}\right]^{-\frac{1}{6}}$

(c) $\left(\dfrac{6}{5}\right)^{\frac{1}{30}}$

(d) $\left(\dfrac{5}{6}\right)^{-\frac{1}{30}}$

OR

On simplification, the expression $\left[\dfrac{2+\sqrt{3}}{2-\sqrt{3}}+\dfrac{2+\sqrt{3}}{2-\sqrt{3}}\right]$ becomes equal to

(a) 0

(b) 1

(c) 14

(d) 2.

2. Degree of the polynomial $4x^4 + 0x^3 + 0x^5 + 5x + 7$ is

(a) 4

(b) 5

(c) 3

(d) 7

OR

One of the factors of the expression

$[x^2 - y^2 - z^2 + 2yz + x + y - z]$ is:

(a) $x - y + z + 1$

(b) $-x + y + z$

(c) $x + y - z + 1$

(d) $x - y - z + 1$

3. Any point on the line $y = x$ is of the form

(a) (a, a)

(b) $(0, a)$

(c) $(a, 0)$

(d) $(a, -a)$

4. Ordinate of all points on the x-axis is

(a) 0

(b) 1

(c) -1

(d) any number

5. In $\triangle ABC$, $BC = AB$ and $\angle B = 80°$. Then $\angle A$ is equal to

(a) $80°$

(b) $40°$

(c) $50°$

(d) $100°$

6. ABCD is a rhombus such that $\angle ACB = 40°$. Then $\angle ADB$ is

(a) $40°$

(b) $45°$

(c) $50°$

(d) $60°$

7. The median of a triangle divides it into two

(a) triangles of equal area

(b) congruent triangles

(c) right triangles

(d) isosceles triangles

8. The radius of a sphere is $2r$, then its volume will be

(A) $\dfrac{4}{3}\pi r^3$

(b) $4\pi r^3$

(c) $\dfrac{8\pi r^3}{3}$

(d) $\dfrac{32}{3}\pi r^3$

9. The mean of five numbers is 30. If one number is excluded , their mean becomes 28. The excluded number is :

(a) 28

(b) 30

(c) 35

(d) 38

OR

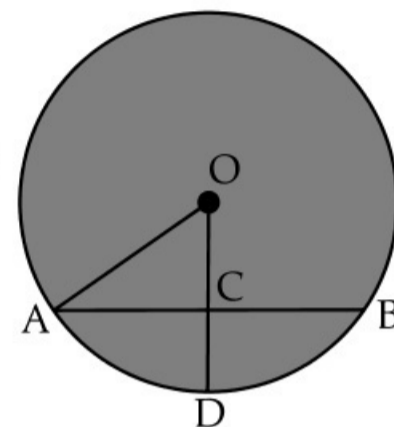If the arithmetic mean of 7, 9, 11, 13, x and 21 is 13, then find the value of x.

10. In Fig. if OA = 5 cm, AB = 8 cm and OD is perpendicular to AB , then CD is equal to :

(a) 2 cm

(b) 3 cm

(c) 4 cm

(d) 1 cm

Questions 11 to 15 carry one mark each State true or false.

11. Zero of a polynomial is always 0.

OR

Quadratic polynomial is a polynomial of degree 4

AI 12. If two interior angles on the same side of the transversal intersecting two parallel lines are in the ratio 2:3 , then the greater of the angles is 108°.

13. Three angles of a quadrilateral are equal. Then it is parallelogram.

14. The area of a triangle with base 4 cm and height 6 cm is 24 cm².

AI 15. In a right circular cone, height, radius and slant height always be sides of a right triangle.

OR

If a cone and a cylinder have the same base radius and same height, then the volume of the cone is half that of the cylinder.

Questions 16 to 20 carry one mark each.

AI 16. Represent $\dfrac{-7}{5}$ on the number line.

17. If each side of a triangle is doubled then how many times the area of triangle increased ?

OR

Find the volume of the largest right circular cone that can be placed in a cube of edge 7cm

18. The angles of a quadrilateral are $(4x°)$, $(7x°)$, $(15x°)$ and $(10x°)$. Find the smallest angle of the quadrilateral.

19. Find the area of an isosceles triangle having base 2 cm and the length of one of the equal sides 4 cm.

20. Explain when a system of axioms is called consistent.

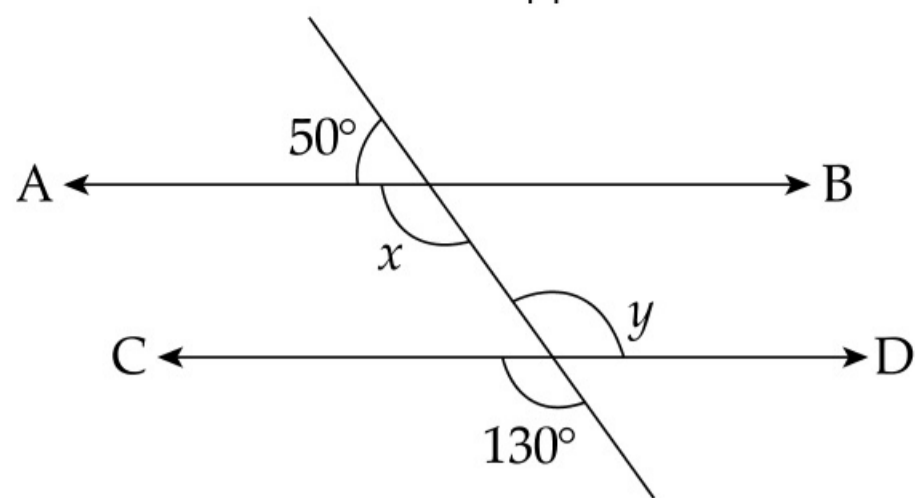## Section 'B'

Questions 21 to 26 carry two marks each

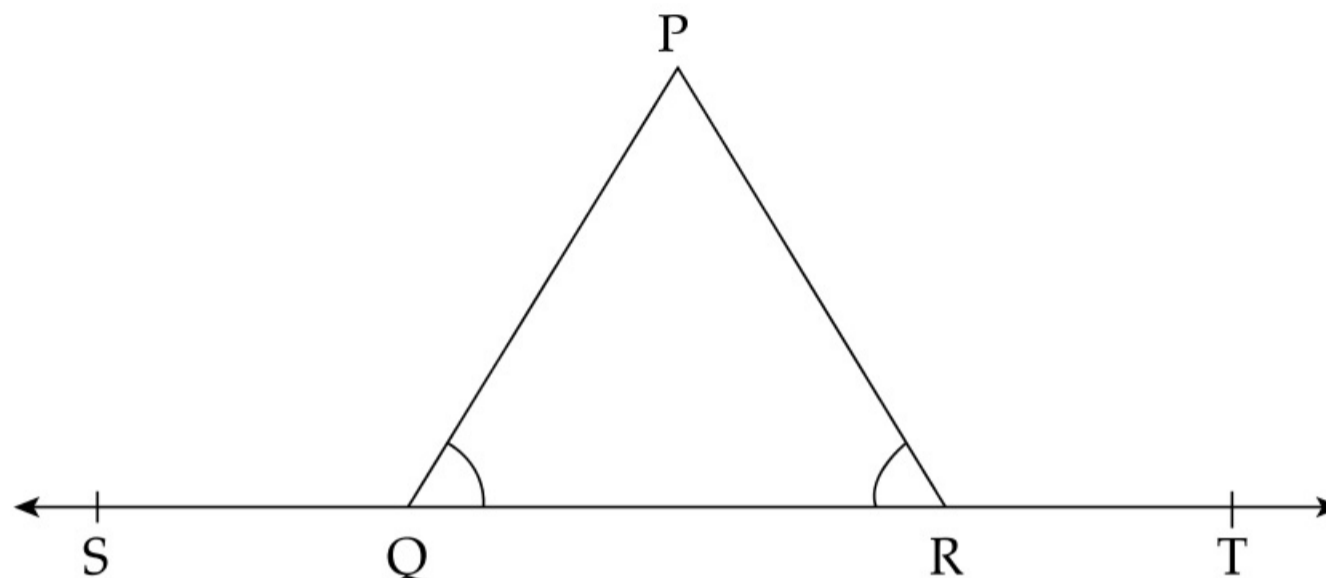**AI 21.** Write the sum of $0.\overline{3}$ and $0.\overline{4}$.

OR

Express $\dfrac{2157}{625}$ in the decimal form and state whether it is terminating or not.

22. State any two Euclid's axioms.

AI 23. Find the value of x and y and then show that $AB||CD$

24.

In figure $\angle PQR = \angle PRQ$ then prove that $\angle PQS = \angle PRT$.

AI 25. A solid shotput is a metallic sphere of radius 4.9 cm. Find the volume of the shotput.

26. In a mathematics test given to 15 students, the following marks are recorded.

41, 39, 48, 52, 46, 62, 54, 40, 96, 52, 98, 40, 42, 52, 60

Find the median and the mode.

Section 'C'

Questions 27 to 34 carry 3 marks each

27. Evaluate 102^3 using suitable identity.

OR

AI Without actually calculating the cubes. Evaluate $14^3 + 13^3 - 27^3$.

28. Draw the graph of the linear equation

$x + y = 7$

At what points, does the graph cut the x axis and the y axis?

29. Write the names of quadrant in which the following co-ordinate points lies, where x and y are natural numbers.
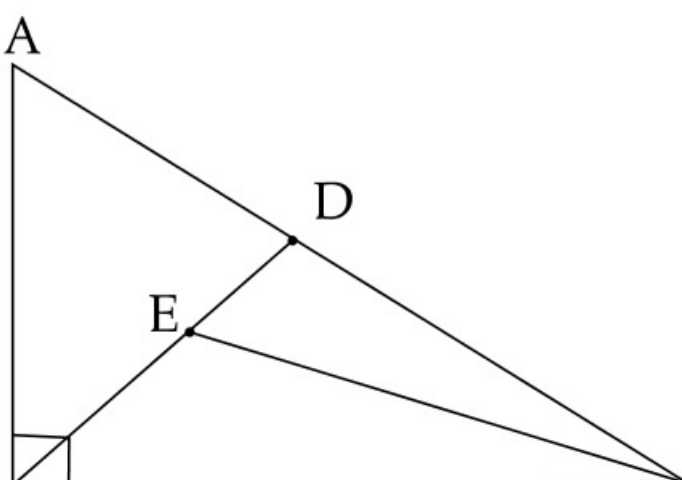
    (i) $(-x, y)$ **(ii)** (x, y)
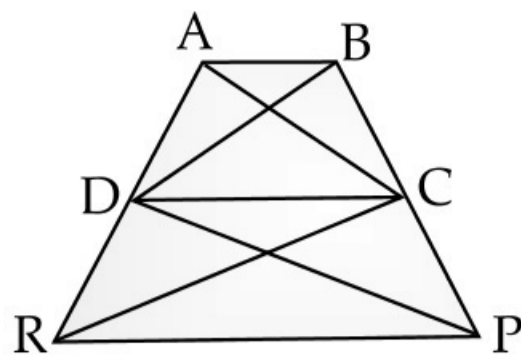
    (iii) $(-x, -y)$

AI 30. Show that the diagonals of a rhombus are perpendicular to each other.

AI 31. In fig $\triangle ABC$ is right angled at B, and BD is its median, E is the mid-point of BD. If AB = 6 cm, AC = 10 cm, calculate ar ($\triangle BEC$)

OR

In the figure, ar (ΔDRC) = ar(ΔDPC) and ar (ΔBDP) = ar (ΔARC). Show that both the quadrilaterals ABCD and DCPR are trapeziums.

Section 'D'

Questions 35 to 40 carry four marks each

[AI] 35. Simplify : $2\sqrt[4]{81} - 8\sqrt[3]{216} + 15\sqrt[5]{32} + \sqrt{225} - \sqrt[4]{16}$

36. If the polynomial $ax^3 + 4x^2 + 3x - 4$ and $x^3 - 4x + a$ leave the same remainder when divided by $(x - 3)$. Find the value of a. **OR**

Factorise $x^3 + 6x^2 + 11x + 6$

[AI] 37. Shade the triangle formed by the graphs of $2x - y = 4$, $x + y = 2$ and the y – axis. Write the co-ordinates of vertices of the triangle.

38. Construct $\triangle ABC$ with $BC = 4$ cm, $\angle B = 75°$ and $AB + AC = 10$ cm.

39. A right – angled $\triangle ABC$ with side 6 cm, 8 cm and 10 cm is revolved about the fixed side of 8 cm. Find the volume of the solid generated. Also find the total surface area of the solid.

A bus stop is barricaded from the remaining part of the road, by using 50 hollow cones made of recycled cardboard. Each cone has a base diameter of 40 cm and height 1 m. If the outer side of each of the cones is to be painted and the cost of painting is ₹ 12 per m², what will be the cost of painting all these cones? (Use π = 3.14 and take $\sqrt{1.04} = 1.02$)

40. The number of literate females in the age group (10 - 57 years) in a village are given below :

Age group (in years)	No. of females
10 - 17	300
18 - 25	980
26 - 33	740
34 - 41	580
42 - 49	260
50 - 57	140
Total	**3000**

Draw a histogram to represent the data above.