

Section 'A'

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

1. Every rational number is
- (a) a natural number
 - (b) an integer
 - (c) a real number
 - (d) a whole number

OR

$$\frac{1}{\sqrt{2}} \text{ is}$$

- (a) a rational number
 - (b) an irrational number
 - (c) a whole number
 - (d) None of these.
2. The value of the polynomial $5x - 4x^2 + 3$, when $x = -1$ is
- (a) -6
 - (b) 6
 - (c) 2
 - (d) -2

OR

When $p(x) = x^4 - 3x^2 + 2x + 1$, is divided by $(x-1)$, then the remainder obtained is :

- (a) 1
 - (b) 2
 - (c) 0
 - (d) None of these
3. The point of $(-3, 2)$ lies in the :
- (a) I quadrant
 - (b) II quadrant
 - (c) III quadrant
 - (d) IV quadrant

OR

In which quadrant does the point $(-5, 7)$ lie?

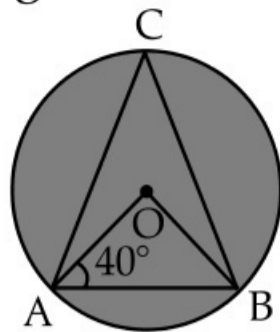
- (a) 1st
 - (b) 2nd
 - (c) 3rd
 - (d) 4th
4. The equation $2x + 5y = 7$ has a unique solution, if x, y are :
- (a) Natural numbers
 - (b) Positive real numbers
 - (c) Real numbers
 - (d) Rational numbers
5. If $AB = QR$, $BC = PR$ and $CA = PQ$, then
- (a) $\triangle ABC \cong \triangle PQR$
 - (b) $\triangle CBA \cong \triangle PRQ$
 - (c) $\triangle BAC \cong \triangle RPQ$
 - (d) $\triangle PQR \cong \triangle BCA$

6. Which of the following is not true for a parallelogram?
- (a) opposite sides are equal
 - (b) opposite angles are equal
 - (c) opposite angles are bisected by the diagonals
 - (d) diagonals bisect each other.

7. What is the length of each side of an equilateral triangle having an area of $4\sqrt{3}$ cm² ?

- (a) 4 (b) 5
(c) 5 (d) 6

8. In the given figure, if $\angle OAB = 40^\circ$, then $\angle ACB$ is equal to :



- (a) 50° (b) 40°
(c) 60° (d) 70°

9. The median of the data 78, 56, 22, 34, 45, 54, 39, 68, 54, 84 is

- (a) 45. (b) 49.5.
(c) 54. (d) 56.

10. A cone is 8.4 cm high and the radius of its base is 2.1 cm. It is melted and recast into a sphere. The radius of the sphere is

- (a) 4.2 cm (b) 2.1 cm
(c) 2.4 cm (d) 1.6 cm

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

AI 11. The sum of two irrational numbers is always irrational.

OR

$(2 + \sqrt{3})(2 - \sqrt{3})$ is a rational number

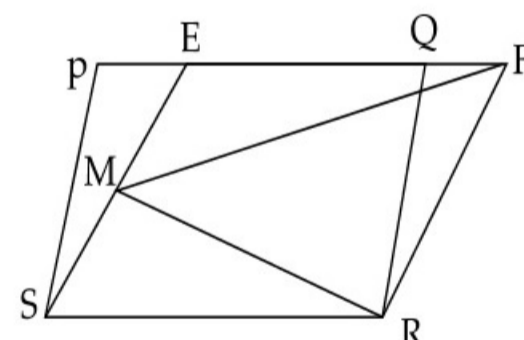
12. The sum of interior angles of a parallelogram is 360°

OR

The diagonals of a parallelogram bisect each other

13. If the radius of a right circular cone is halved and height is doubled, the volume will remain unchanged.

14. PQRS and EFRS are two parallelograms, then $\text{ar}(\text{MFR}) = \frac{1}{2}(\text{PQRS})$.



15. If the area of a triangle equals the area of a rectangle and the area of the rectangle equals that of a square, then the area of the triangle also equals the area of the square.

Questions 16 – 20 carry 1 mark each

16. Find the value of a , if $x - a$ is a factor of $x^3 - ax^2 + 2x + a - 1$.

17. Can a triangle have two obtuse angles? Give reason for your answer.

18. Diagonals AC and BD of a parallelogram ABCD intersect each other at O. If $OA = 3$ cm and $OD = 2$ cm, determine the lengths of AC and BD.

19. Compute the curved surface area of a hemisphere whose diameter is 14 cm.

OR

A cylinder and a right circular cone having the same base and same height. Find the ratio of the volume of the cylinder to the volume of the cone.

20. Find the area of triangle whose sides are 4cm, 5cm and 3cm.

Section 'B'

Questions 21 – 26 carry 2 marks each

AI 21. Insert three rational numbers between $\frac{3}{5}$ and $\frac{5}{7}$

OR

Express $0.\overline{62}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

22. Ram and Ravi have the same weight. If they each gain weight by 2kg, how will their new weights be compared?

AI 23. How many triangles can be drawn having its angles as 53° , 64° , and 63° ? Give reason for your answer.

OR

If one of the angles formed by two intersecting lines is a right angle, what can you say about the other three angles? Give reason for your answer.

24. In a triangle PQR, X and Y are the points on PQ and QR respectively. If $PQ = QR$ and $QX = QY$, show that $PX = RY$.

25. The total surface area of a cube is 726 cm^2 . Find the length of its edge.

26. Find the mean of the data : 2, 8, 6, 5, 4, 5, 3, 6, 4, 9, 1, 5, 6, 5, 6.

Section 'C'

Questions 27 – 34 carry 3 marks each

AI 27. If $P(x) = 2x^3 + 5x^2 - 3x - 2$ is divided by $x - 1$, find the quotient and remainder.

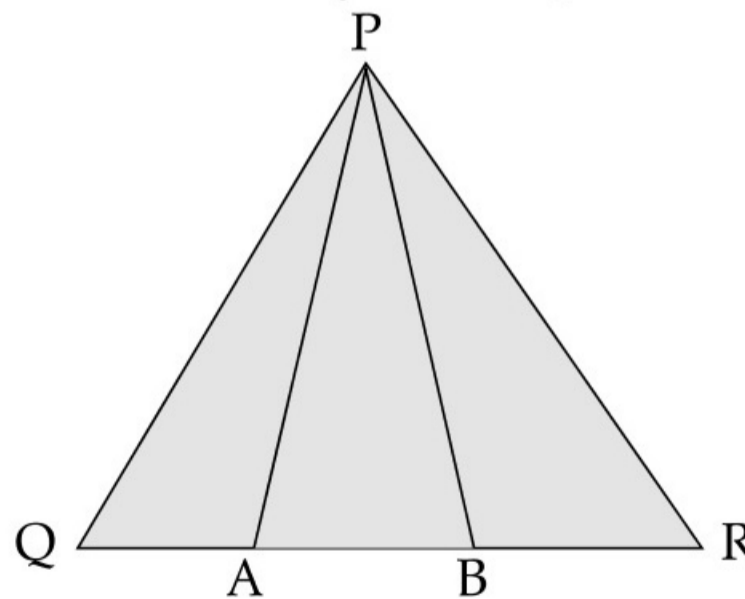
28. Find the points on the line $2x + 3y = 12$, where it cut the X and Y axes.

AI 29. Plot the point P $(-6, 2)$ and from it draw PM and PN as perpendiculars to x-axis and y-axis, respectively. Write the coordinates of the points M and N.

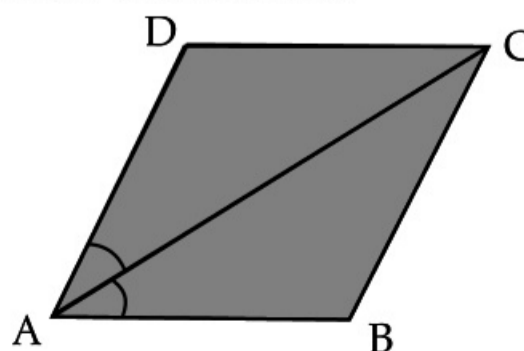
OR

Draw the quadrilateral ABCD whose vertices are $A(0, 0)$, $B(5, 0)$, $C(3, 2)$ and $D(0, 2)$.

30. In ΔPQR , A and B are points on sides QR such that they trisect QR. Prove that :
 $\text{ar}(\Delta PQB) = 2\text{ar}(\Delta PBR)$



31. Diagonal AC of a parallelogram ABCD bisects $\angle A$



Show that:

- (i) it bisects $\angle C$ also,
- (ii) ABCD is a rhombus.

32. In $\triangle ABE$, $AE = BE$. Circle through A and B intersects AE and BE at D and C . Prove that $DC \parallel AB$

OR

AB and CD are two parallel chords on the same side of the circle such that $AB = 6$ cm, $CD = 8$ cm. The small chord is at a distance of 4 cm from the centre. At what distance from the centre is the other chord?

33. One side of an equilateral triangle measures 8 cm. Find its area using Heron's formula. What is its altitude?

OR

An isosceles triangle has perimeter 30 cm and each of the equal side is 12 cm. How much area does it occupy?

34. The weights of 60 persons in a group are given below :

Weight (in kg)	60	61	62	63	64	65
Number of persons	5	18	4	16	5	12

Find the probability that a person selected at random has :

- (i) weight less than 65 kg
- (ii) weight between 61 and 64 kg
- (iii) weight equal to or more than 64 kg

Section 'D'

Questions 35 – 40 carry 4 marks each

35. Give an example of two irrational numbers whose :

- (i) difference is an irrational number,
- (ii) sum is an irrational number,
- (iii) product is an irrational number,
- (iv) division is an irrational number.

AI 36. If $a + b + c = 6$ and $ab + bc + ca = 11$, find the value of $a^3 + b^3 + c^3 - 3abc$.

OR

If $x^3 + mx^2 - x + 6$ has $(x - 2)$ as a factor, and leaves a remainder ' n ' when divided by $(x - 3)$, find the values of m and n .

37. For the linear equation $3x - 5y - 15 = 0$, find the points where its graph intersects x and y axis. Using these, draw the graph of the equation. And find its area.

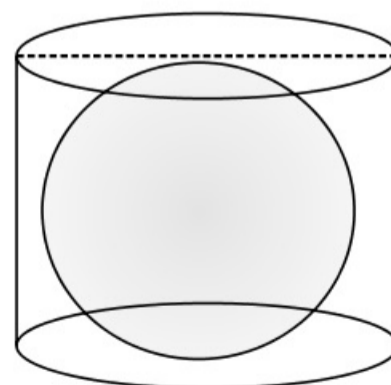
AI 38. Construct a triangle ABC , in which $\angle B = 60^\circ$, $\angle C = 45^\circ$ and $AB + BC + CA = 11$ cm.

39. A cylindrical bowl right circular cone of internal diameter 18 cm and height 15 cm is full of liquid. The whole of the liquid is to be filled in small cylindrical bottles of diameter 3 cm and height 4 cm. Each bottle is sold for ₹ 5, then find the amount earned.

OR

A right circular cylinder just encloses a sphere of radius r (see Fig.) Find

- (i) surface area of the sphere,
- (ii) curved surface area of the cylinder,
- (iii) ratio of the areas obtained in (i) and (ii).



40. Construct a grouped frequency distribution table with class intervals 0 – 5, 5 – 10 and so on for the following marks obtained in Biology (out of 50) by a group of 35 students in an examination:

0, 5, 6, 7, 10, 12, 14, 15, 20, 22, 25, 26, 27, 8, 11, 17, 3, 6, 9, 17, 19, 21, 22, 29, 31, 35, 37, 40, 42, 45, 49, 4, 50, 16, 20 Also, draw a histogram to represent the above data.