

1. This Question Paper has 5 Sections A, B, C, D and E.
2. In Section A - question number 1 to 18 are multiple choice questions (MCQs) and question number 19 and 20 are Assertion-Reason based questions of 1 mark each.
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub- parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required.

SECTION A (1 MARK EACH)**Multiple choice questions: -**

- Q1 The number of rational numbers between 15 and 18 are :-
(a) one (b) two (c) finite (d) infinite
- Q2 What is the coefficient of x^3 in the polynomial $-x^3 + 4x^2 + 7x - 2$?
(a) -1 (b) 4 (c) 7 (d) -2
- Q3 Which of the following is a solution of $4x + 3y = 12$?
(a) (0,4) (b) (3,0) (c) Both a and b (d) (5,6)
- Q4 If x coordinate of a point is zero, then the point lies on:
(a) First quadrant
(b) Second quadrant
(c) x axis
(d) y axis
- Q5 Two angles are said to be complementary, if the sum of their measures is _____
(a) 45° (b) 90° (c) 180° (d) 360°
- Q6 The sum of the length of three sides of a triangle is called its
(a) Area (b) Perimeter (c) Circumference (d) Volume
- Q7 A diagonal of a parallelogram divides it into two _____.
(a) equilateral triangles
(b) Congruent triangles
(c) Isosceles triangles
(d) Scalene triangles
- Q8 A chord of a circle is equal to its radius. Find the angle subtended by this chord at a point in major segment.
(a) 30° (b) 45° (c) 60° (d) 75°

- Q9 If the perimeter of an equilateral triangle is 180 cm. Then its area will be:
 (a) 900 cm^2 (b) $900\sqrt{3} \text{ cm}^2$ (c) $300\sqrt{3} \text{ cm}^2$ (d) $600\sqrt{3} \text{ cm}^2$
- Q10 The volume of a hemisphere whose radius is r is:
 (a) $\frac{4}{3}\pi r^3$ (b) $4\pi r^3$ (c) $2\pi r^3$ (d) $\frac{2}{3}\pi r^3$
- Q11 What is the class mark of the class interval 90-120?
 (a) 90 (b) 105 (c) 115 (d) 120
- Q12 Which of the following is rational :-
 (a) $4/0$ (b) $0/4$ (c) $\sqrt{3}$ (d) $\sqrt{2}$
- Q13 The linear equation $2x - 5y = 7 - x$ has
 (a) No solution (b) unique solution (c) Two solutions (d) Infinitely many solutions
- Q14 Ordinate of all the points on the y-axis is
 (a) 0 (b) 1 (c) -1 (d) any number
- Q15 Two parallel lines intersect at:
 (a) one point (b) two points (c) three points (d) zero point
- Q16 The angles opposite to equal sides of a triangle are:
 (a) Equal (b) Right angles (c) Supplementary angles (d) Complementary angles
- Q17 A trapezium has:
 (a) One pair of opposite sides parallel
 (b) Two pairs of opposite sides parallel to each other
 (c) All its sides are equal
 (d) All angles are equal
- Q18 If there are two circles drawn apart from each other, then the maximum number of common points they have:
 (a) 0 (b) 1 (c) 2 (d) 3
- Q19 Assertion: In a cyclic quadrilateral ABCD, if two sides are parallel, then diagonals intersect at the centre of circle.
 Reason: If two sides are parallel in a cyclic quadrilateral ABCD, then remaining two sides are equal.
 (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true but R is not the correct explanation of A.
 (c) A is true but R is false.
 (d) A is false but R is true.
- Q20 Assertion: 3 is a rational number.
 Reason: The square roots of all positive integers are irrationals.
 (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true but R is not the correct explanation of A.
 (c) A is true but R is false.
 (d) A is false but R is true.

SECTION B (2 MARKS EACH)

- Q21 Simplify by rationalizing the denominator: $\frac{6-4\sqrt{2}}{6+4\sqrt{2}}$

OR

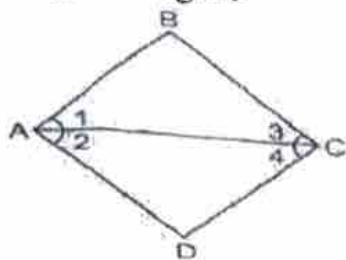
Express $0.\overline{621}$ as a rational number in $\frac{p}{q}$ form

Write the coordinates of the following:

- (a) 4 units right to the origin and 3 units below origin.
 (b) 2 units above origin and 1 unit left to the origin.

Q23

In the given figure



- (a) If $\angle 1 = \angle 2$ and $\angle 2 = \angle 3$, then prove that $\angle 1 = \angle 3$.
 (b) If $\angle 1 = \angle 3$ and $\angle 2 = \angle 4$, then prove that $\angle A = \angle C$

Q24

ABCD is a quadrilateral in which P, Q, R and S are mid-points of the sides AB, BC, CD and DA. AC is a diagonal. Draw diagram and show that $SR \parallel AC$ and $SR = \frac{1}{2} AC$

OR

The angles of quadrilateral are in the ratio 3:5:9:13. Find all the angles of the quadrilateral.

Q25

Diameter of the base of a cone is 10.5 cm, and its slant height is 10 cm. Find its curved surface area. (Assume $\pi = \frac{22}{7}$)

OR

Diameter of sphere is 14 cm. Find its total surface area.

SECTION C (3 MARKS EACH)

Q26

Represent $\sqrt{7.3}$ on the number line.

Q27

Find the value of k, if $x-1$ is a factor of $p(x)$

(i) $p(x) = x^2 + x + k$

(ii) $p(x) = x^2 + 2x + k$

Q28

Express the following linear equations in the form $ax+by+c=0$ and indicate the values of a, b and c in each case:

(i) $2x+3y=9.35$

(ii) $y-2=0$

Q29

Prove that angles opposite to equal sides of an isosceles triangle are equal.

OR

In triangle ABC, the bisector AD of $\angle A$ is perpendicular to side BC. Show that $AB=AC$ and triangle ABC is isosceles.

Q30

PQRS is a rhombus with $\angle PQR = 58^\circ$. Determine $\angle PRS$.

OR

Show that area of a rhombus is half the product of the length of its diagonals.

Q31

In a city, the weekly observations made in a study on the cost-of-living index are given in the following table:

Cost of living index	No. of weeks
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140 - 150	5
150 - 160	10
160 - 170	20
170 - 180	9
180 - 190	6
190 - 200	2
Total	52

Draw a frequency polygon for the data above.

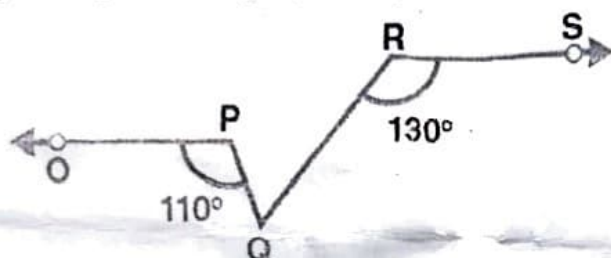
SECTION D (5 MARKS EACH)

Q32 Verify $x^3 + y^3 = (x+y)(x^2 - xy + y^2)$

OR

If $x+y+z=0$, show that $x^3 + y^3 + z^3 = 3xyz$

Q33 In the given figure, if $OP \parallel RS$, $\angle OPQ = 110^\circ$ and $\angle QRS = 130^\circ$, Find $\angle PQR$.



Q34 A triangular park ABC has sides 120m, 80m and 50m. A gardener Dhania has to put a fence all around it and also plant grass inside. How much area does she need to plant? Find the cost of fencing it with barbed wire at the rate of Rs20 per meter leaving a space 3m wide for a gate on one side.

Q35 The diameter of the moon is approximately one fourth of the diameter of the earth. What fraction of the volume of the earth is the volume of the moon?

OR

Q36 The height of a cone is 16cm and its base radius is 12cm. Find the volume and the total surface area of the cone.

SECTION E CASE STUDY (4 MARKS EACH)

Q36 Shiela made cookies for Arun and Ram. Arun and Ram ate the cookies. Together they ate 15 cookies. Taking the cookies eaten by Arun as x and Ram as y , answer the following questions:

- Write an equation for the above situation. (1)
- How many cookies did Arun eat, if Ram ate 10 cookies. (1)
- If Ram ate 4 times the number of cookies Arun ate, how many cookies did Ram eat? (2)

OR

Q37 Find four solutions of the equation formed in part (a).

Q37 Saniya has a triangular box. It has three sides 4cm, 13cm and 15cm. She is curious to find out its various properties.

- If all sides of triangle are different in length, then it is which type of triangle? (1)
- Find the semi perimeter of the above triangle. (1)
- Find the area of the triangle using heron's formula (2)

OR

Find the height of an equilateral triangle with side 40cm.