Maximum Marks: 80
Time allowed: Two hours and 30 minutes
Answer to this paper must be written on the paper provided separately
You will not be allowed to write during first 15 minutes.
This time is to be spent in reading the question paper.
The time given at the head of this Paper is the time allowed for writing the answers.
***Section A** is compulsory. Attempt **any four** questions from **Section B**.*
The intended marks for the questions or parts of questions are given in brackets [ ].

SECTION A
(Attempt all questions.)

Question 1: Choose the correct answer to the questions from the given options: **[15]**

1. The class boundaries of the class interval 20 – 30 are:
   a. 10,20
   b. 20,30
   c. 0,10
   d. 90,100

2. State the class size if the given class interval 35 – 55:
   a. 35
   b. 55
   c. 20
   d. 45

3. The mean of first five natural numbers is:
   a. 15
   b. 3
   c. 7.5
   d. 5

4. The area of a triangle whose base is 20cm and the corresponding altitude is 7cm:
   a. $140cm^2$
   b. $27 cm^2$
   c. $70 cm^2$
   d. $10 cm^2$

5. Calculate the area of an equilateral triangle whose perimeter is 36cm:
   a. $72\sqrt{3} cm^2$
   b. $144\sqrt{3} cm^2$
   c. $36\sqrt{3} cm^2$
   d. $48\sqrt{3} cm^2$

6. The length of diagonal of square with side 20cm is:
   a. 28.28cm
   b. 80cm
   c. 58.6cm
   d. 26.4cm

7. Expand the given expression $(6x – 5y)^2$:
   a. $36x + 25y + 60xy$
   b. $36x^2 + 25y^2 – 60xy$
   c. $6x + 5y + xy$
   d. $6x – 5y – 6xy$

8. Solve for x: $5(x + 4) – 3(5 – x) = 45$
   a. 10
   b. 12
   c. 5
   d. 20

9. The total surface area S of a cylinder of radius r and height h is given by the formula: $S = 2\pi r (h + r)$. Make '*h*' as the subject of the formula.
   a. $h = S – 2\pi r + r$
   b. $h = \frac{S}{2\pi r} + r$
   c. $h = 2\pi r^2$
   d. $h = \frac{S}{2\pi r} – r$

10. Evaluate: $9^{5/2} – 3 \times 5^0 \times \left(\frac{1}{81}\right)^{-1/2}$
    a. 231
    b. 216
    c. 243
    d. 280

11. What will Rs. 8000 amount to in 2 years at 5% p.a. interest compounded annually:
    a. Rs. 9860
    b. Rs. 5400
    c. Rs 8820
    d. Rs. 10560

12. A quadrilateral is a parallelogram only if:
    a. Opposite sides are equal
    b. Opposites side are parallel
    c. Opposite angles are equal
    d. All of the above

13. What will be the perimeter of a semi-circle of radius 21cm?
    a. 132cm
    b. 108cm
    c. 156cm
    d. 66cm

14. Evaluate the expression: $(979)^2 – (21)^2$
    a. 785000
    b. 536000
    c. 958000
    d. 684200

15. The total surface area of a cuboid of dimensions 12cm, 6cm and 2cm will be:
    a. $216cm^2$
    b. $500 cm^2$
    c. $480 cm^2$
    d. $612 cm^2$

Question 2:

1. Given that PQRS is a parallelogram, find the value of 'a' and hence find all the unknown interior angles marked in the figure. **[4]**
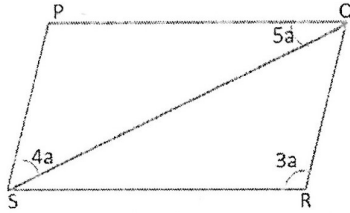
2. ABC is an isosceles triangle inscribed in a circle. If AB = AC = $12\sqrt{5}$ cm and BC = 24 cm, then find the radius of the circle. **[4]**

3. The compound interest on a certain sum of money at 5% per annum for two years is Rs. 246. Find the sum of money. **[4]**

Question 3:

1. A solid piece of metal, cuboid in shape, with dimensions 24 cm, 18 cm and 4 cm is recast into a cube. Calculate the lateral surface area of the cube so formed. **[4]**

2. In a test given to a group of students, the marks obtained by them (out of 100) are: 41, 39, 52, 48, 54, 62, 46, 52, 40, 96, 42, 40, 98, 60 and 52.
   Calculate the mean and median for the given set of data. **[4]**

3. Draw a histogram and a frequency polygon for the given set of data on the same graph sheet. **[5]**

Age(years)	Frequency
40 – 50	8
50 – 60	16
60 – 70	9
70 – 80	14
80 – 90	4

SECTION B
*(Attempt **any four** questions from this section.)*

Question 4:

1. The perimeter of a rectangular plot is 120 m. If the length of the plot is twice its width, find the area of the plot. **[3]**

2. In the given figure PQRS is a square. L and M are respectively the mid points of PS and QR. Find the area of ΔOLS, if PQ = 8 cm and O is the point of intersection of LM and QS. **[3]**
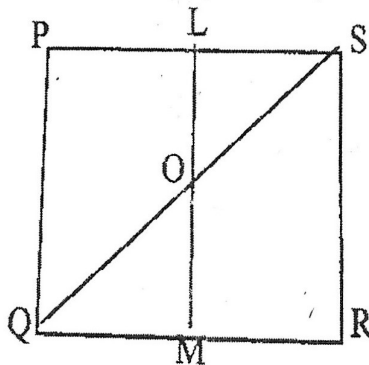
3. Construct a parallelogram ABCD with AB = 3 cm, BC = 4 cm and AC = 4.5 cm. **[4]**

Question 5:

1. The length of the common chord of the two intersecting circles is 30 cm. If the radii of the two circles re 25 cm and 17 cm, find the distance between their centres. **[3]**

2. If the numbers 3, 6, 7, 10, x, 15, 19, 20, 25, 28 are in ascending order and their median is 13, calculate the value of x. **[3]**

3. Simplify by rationalising the denominator: **[4]**

$$\frac{7 + 3\sqrt{5}}{7 - 3\sqrt{5}}$$

Question 6:

1. Two poles of heights 6m and 11 m stand on a plane ground. If the distance between their feet is 12 m, find the distance between their tops. **[3]**

2. The sum of interior angles a polygon is 6 times the sum of its exterior angles. Find the number of sides in the polygon. **[3]**

3. The ages of A and B are in the ratio 9:4.seven years hence the ratio of their ages will be 5:3. Find their present ages. **[4]**

Question 7:

1. Prove that the diagonals of a rhombus bisect the vertex angles.   **[3]**
2. Evaluate the given expression: $\log_3 54 - \log_3 6$ **[3]**
3. With respect to the given graph answer the following questions: **[4]**
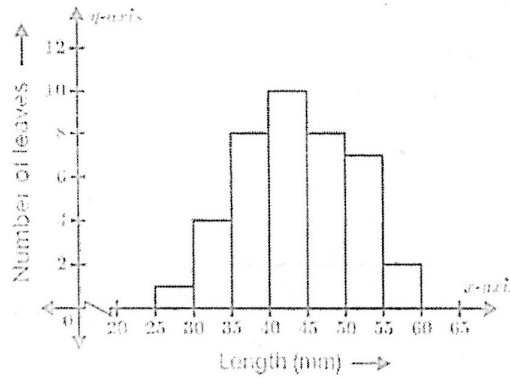
i.   State the highest frequency
ii. The class interval of the lowest frequency.
iii. Class size of the class intervals shown.
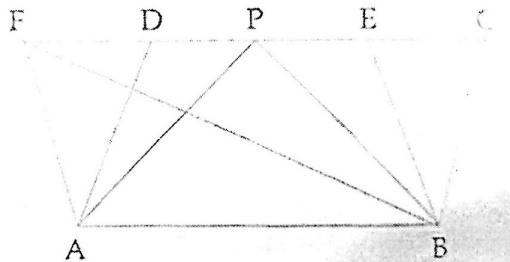iv. Class intervals with common frequencies.

Question 8:

1. A triangle and a parallelogram both have a base of 5 cm and area of 50 cm² each. Find the ratio of their heights.   **[3]**
2. Following are the marks of 24 students in a subject:
    45, 29, 15, 48, 0, 30, 15, 3, 11, 23, 12, 42, 30, 48, 23, 35, 50, 2, 40, 18, 3, 11, 30 and 44.
    Prepare a frequency distribution table with tally marks, one of the overlapping class intervals being 10 – 20.   **[3]**
3. The volume of a cuboidal block of silver is 10368 cm³. If the dimensions of the cuboid are in the ratio 3 : 2 : 1, then find: **[4]**
    i.   The length, breadth and height of the cuboidal block
    ii. The cost of gold polishing its entire surface at Rs. 5 per cm²

Question 9:

1. The mean of 6 observations is 17.5. If five of them are 14, 9, 23, 25 and 10, find the sixth observation.   **[3]**
2. Using special identities expand the given expression: **[3]**
    i. $(3x + 4y)^3$
    ii. $(3a - \frac{1}{5a})^2$
3. One angle of a pentagon is 140°. If the remaining four angles are in the ratio 1 : 2 : 3 : 4, calculate the size of the greatest and the smallest angle.   **[4]**

Question 10:

1. The perimeter of a square is 44 cm. Calculate its area and the length of diagonal.   **[3]**
2. PQRS is rhombus. If PQ = 3x + 5, QR = 6x – 10, PR = 3y – 1 and PR = PQ then find the values of x and y.   **[3]**
3. In the given figure ABCD and ABEF are parallelograms and P is any point on DC. If the area of ‖ gm ABCD = 90 cm², then find: **[4]**

i.   Area of ‖ gm ABEF
ii. Area of ΔABP
iii. Area of ΔABF
iv. Area of ΔBEF

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