Estd. 1861

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 [ ].
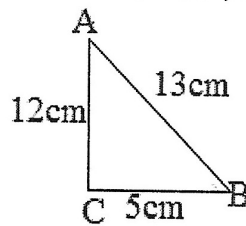
SECTION A
*(Attempt **all** questions.)*

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

1. Given is a triangle ABC where $\angle C = 90°$, find the value of cosec A: B:

a. $5/13$	b. $13/12$
c. $12/5$	d. $12/13$

2. What is the value of cot 30°?

a. 0	b. $\sqrt{3}$
c. 1	d. ∞

3. If the value of sin 33° = x, then find the value of cos57°.

a. x	b. $1/x$
c. $1 - x$	d. $x - 1$

4. State the co-ordinates of point lying on the x-axis and whose abscissa is −6.

a. (-6 , -6)	b. (0 , 0)
c. (0 , -6)	d. (-6 , 0)

5. What is the slope of line which makes an angle of 45° with the positive direction of the x-axis?

a. 0	b. 1
c. -1	d. 45°

6. Write the expansion of the given expression: $(x - 7)^2$

a. $x^2 - 49$	b. $x^2 + 49 + 14x$
c. $x^2 + 49 - 14x$	d. $x^2 + 49$

7. Factorise the given expression: $a(a - b) + b - a$

a. $a^2 - ab + b - a$	b. $(a - b)(a - 1)$
c. $(a + b)(a + 1)$	d. $a^2 + ab - b + a$

8. Solve for 'x': $3x - 2(3x - 5) = x - 6$

a. 4	b. 5
c. 6	d. 7

9. In a triangle ABC, $\angle B = 90°$. If AB = 10cm and BC = 24cm, then what is the length of AC?

a. 34cm	b. 14cm
c. 26cm	d. 50cm

10. A chord AB, 24cm in length, is at a distance of 5cm from the centre O. What will be the radius of the circle?
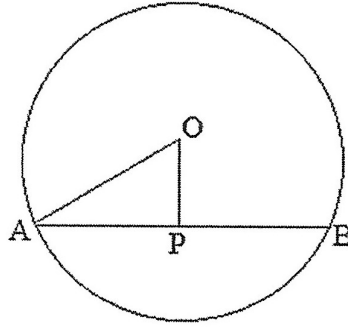
a. 12cm	b. 10cm
c. 13cm	d. 24cm

11. State the class mark for the given class interval: 100 – 150

a. 100	b. 150
c. 125	d. 50

12. If the perimeter of a square is 40cm, then what should be the area of it?

a. $10cm^2$	b. $100cm^2$
c. $1000cm^2$	d. None of the above

13. The length of diagonal of a cube is given by the formula:

a. L x B x H	b. $Side^2$
c. $Side.\sqrt{2}$	d. $Side.\sqrt{3}$

14. Fill in the blanks: $\sec^2\theta - 1 = $ _____

a. $\csc^2\theta$	b. $\tan^2\theta$
c. $\sin^2\theta$	d. $\cos^2\theta$

15. If $3\sin\theta = 4\cos\theta$, then what is the value of $\tan\theta$?

a. $3/4$	b. $4/3$
c. $5/4$	d. $3/5$

Question 2:

1. If $5\sin\theta - 4 = 0$, then find the value of: $\frac{5\sin\theta - 3\cos\theta}{5\sin\theta + 2\cos\theta}$. **[4]**

2. Find the distance between the points A (3, 7) and B which is on the y – axis whose ordinate is 11. **[4]**

3. Divide 28 into two such parts that the difference of their squares is 112. Find the two parts **[4]**

Question 3:

1. Without using trigonometric tables, prove that:
$$\frac{\tan\theta}{\tan(90°-\theta)} + \frac{\sin(90°-\theta)}{\cos\theta} = \sec^2\theta.$$ **[4]**

2. Solve the given pair of simultaneous linear equations by using any method: **[4]**
$$\frac{7}{x} + \frac{8}{y} = 2$$
$$\frac{2}{x} + \frac{12}{y} = 20$$

3. Draw the graph of line given by $4x + 5y - 20 = 0$ and from the graph find its intercept on y – axis. **[5]**

SECTION B
*(Attempt **any four** questions.)*

Question 4:

1. Factorise the given expression: $12x^3 - 8x^2 - 20x$ **[3]**

2. The sum of interior angles of a regular polygon is 6 times the sum of exterior angles. Find the number of sides of the polygon. **[3]**
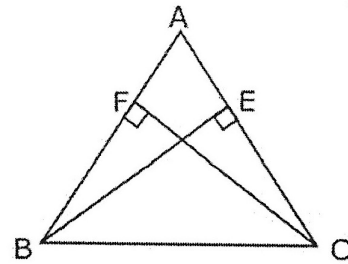
3. The following observations are arranged in ascending order. If the median of the data is 63, then find the value of x. Hence, also find the mean for the same set of values: **[4]**
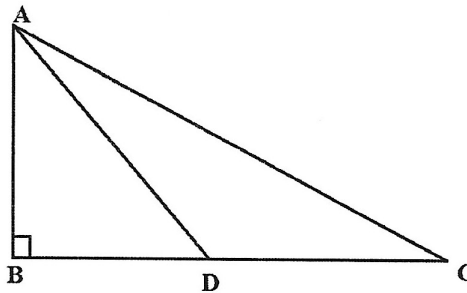
$$29, 32, 48, 50, x, x+2, 72, 75, 87, 91.$$

Question 5:

1. ABC is a triangle in which altitudes BE and CF to sides AC and AB are equal. Show that: **[3]**

   a. $\Delta ABE \cong \Delta ACF$

   b. ΔABC Is an isosceles triangle.

2. In the given figure, $\angle ABC = 90°$, AD = 10 cm, BD = 6 cm and DC = 9 cm. Calculate the length of AC. **[3]**

3. If $x + y = 8$, $xy = 15$, using special products find the value of: **[4]**
   a. $x^2 + y^2$
   b. $x^3 + y^3$.

Question 6:

1. A cube of edge 8 cm is immersed completely in a rectangular vessel containing water. If the dimensions of base are 10 cm and 12 cm, find the rise in water level in the vessel. **[3]**

2. Evaluate: **[3]**

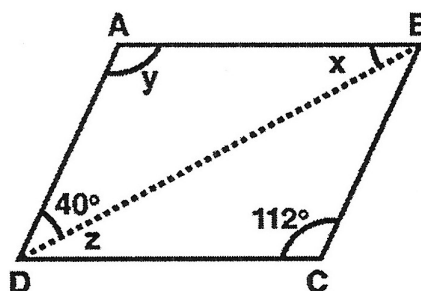$$2.\left(\frac{\sin 72°}{\cos 18°}\right)^2 + 5.\left(\frac{\sin 35°}{\cos 55°}\right)^2 - 3\sin 30°$$

3. If $x = 45°$ and $y = 30°$, then verify that $\dfrac{\sin x}{\cos x + \sin x.\sin y} = \dfrac{2}{3}$ **[4]**

Question 7:

1. Evaluate: $[243]^{3/5} - \left[\frac{1}{64}\right]^{-2/6} + [125]^{1/3}.\left[\frac{1}{2}\right]^{-2}.[17]^0$ **[3]**
2. A plot 110m long and 80m wide is to be covered with grass leaving 5 metres all around. Find the area of the plot in which grass is laid. **[3]**
3. In the given figure ABCD is parallelogram, find the values of unknown angles 'x', 'y' and 'z' marked: **[4]**
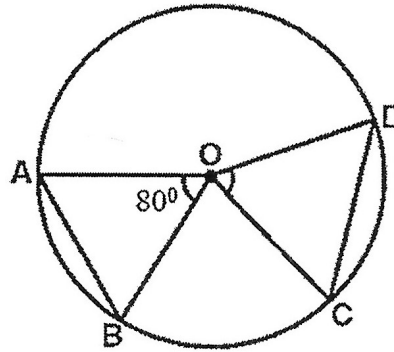

Question 8:

1. Prove that the points A $(0, -9)$, B $(4, -3)$ and C $(10, 6)$ are collinear. **[3]**
2. Calculate the area of a right triangle whose hypotenuse is 65 m and one side is 16 m. **[3]**

3. If A = 60° and B = 30° then verify :   **[4]**
   sin (A + B) = sin A. cos B + cos A. sin B

Question 9:

1. AB and CD are two equal chords of circle with centre O. If$\angle AOB = 80°$, then find$\angle OCD$.
   **[3]**

2. A man invests Rs. 5000 for three years at a certain rate of interest compounded annually. At the end three years it amounts to Rs. 6655, calculate the rate of interest.   **[3]**

3. With the help of the given figure find the length of side *AC and AE*, where the other dimensions are as follows: **[4]**
   DE = 1.6 m; CD = 20√3 m; $\angle AED = 30°$ *and* $\angle ABE = \angle ACD = \angle CDE = 90°$
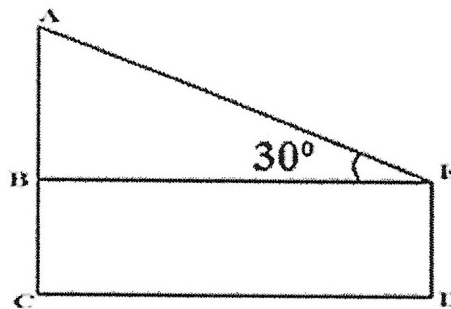
Question 10:

1. Determine the slope, y – intercept and the inclination with the positive direction of the   x – axis for the given line graph: $4\sqrt{3}x - 4y - 3 = 0$.   **[3]**
2. Evaluate: *cos 42°cos79° - sin 48°sin 11° + tan² 60°. tan² 30°*   **[3]**
3. Read the given histogram and answer the questions that follow: **[4]**
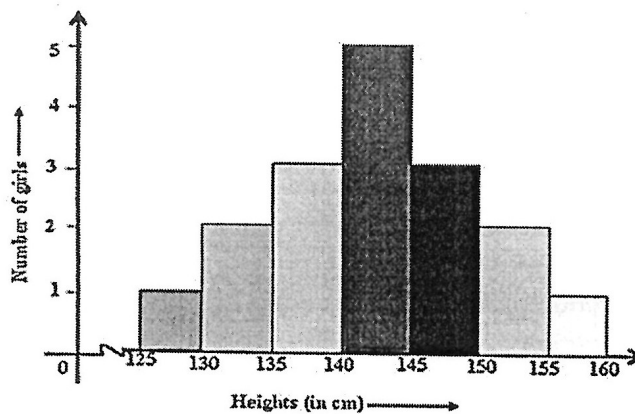
a. What information is depicted by the histogram?
b. Which group contains the maximum number of girls?
c. Which groups contain the minimum number of girls?
d. Heights of how many girls are 140 cm or more?

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