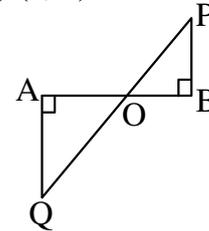




- (g) Q is a point on  $x$ -axis at a distance of 5 units from  $y$ -axis to its right. The coordinates of the point Q are 1

(i) (0, 5)                      (ii) (5, -5)                      (iii) (-5, 5)                      (iv) (5, 0)

- (h) QA and PB are perpendiculars on AB. If AO = 10 cm, BO = 6 cm and PB = 9 cm, then the measure of AQ is 1
- (i) 6.67cm                      (ii) 10 cm  
(iii) 15 cm                      (iv) 25 cm



- (i) If  $\Delta PQR \sim \Delta XYZ$ ,  $\angle Q = 70^\circ$ ,  $\angle R = 60^\circ$ , what is the measure of  $\angle X + \angle Y$ ? 1
- (i)  $130^\circ$                       (ii)  $120^\circ$                       (iii)  $110^\circ$                       (iv)  $50^\circ$

- (j) The number of tangents to a circle which are parallel to a given chord is 1
- (i) infinite                      (ii) 3                      (iii) 2                      (iv) 1

- (k) If the perimeter and the area of a circle are numerically equal, then the radius of the circle is 1
- (i) 2 units                      (ii)  $\pi$  units                      (iii) 4 units                      (iv)  $2\pi$  units

- (l) The ratio of the total surface area to the lateral surface area of a cylinder with base radius 80 cm and height 20 cm is 1
- (i) 2 : 1                      (ii) 3 : 1                      (iii) 4 : 1                      (iv) 5 : 1

- (m) The construction of Cumulative Frequency table is useful to determine 1
- (i) Mode                      (ii) Mean                      (iii) Median                      (iv) All the above

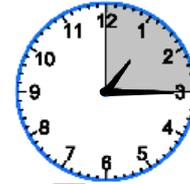
- (n) Two coins are tossed simultaneously. The probability of getting atmost one head is 1
- (i)  $\frac{3}{4}$                       (ii)  $\frac{1}{3}$                       (iii)  $\frac{1}{2}$                       (iv)  $\frac{1}{4}$

- (o) A die is thrown once. The probability of getting a composite number is 1
- (i)  $\frac{1}{6}$                       (ii)  $\frac{1}{3}$                       (iii)  $\frac{1}{2}$                       (iv) 1

**Section – B**

2. Prove that  $\frac{3+\sqrt{5}}{2}$  is an irrational number, given that  $\sqrt{5}$  is an irrational number. 2
3. Find the roots of the quadratic equation  $2x^2 - x + \frac{1}{8} = 0$  by factorisation. 2
4. Given  $15 \cot A = 8$ , find  $\sin A$  and  $\sec A$ , with the help of a right triangle. 2

5. In a rectangle, the angle between a diagonal and a side is  $30^\circ$ , and the length of its diagonal is 8 cm. Find the dimensions of the rectangle. 2
6. Find the point on the  $x$ -axis which is equidistant from  $(2, -5)$  and  $(-2, 9)$  2
7. A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time, a tower casts a shadow 28 m long. Find the height of the tower. 2
8. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 15 minutes. 2

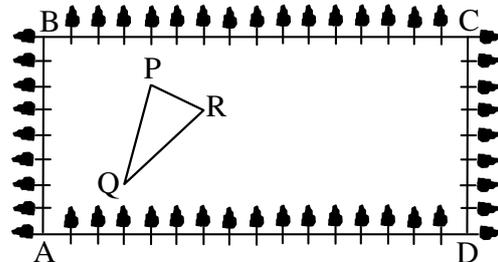


**Section – C**

9. (a) Find the zeroes of the quadratic polynomial  $6x^2 - 3 - 7x$  and verify the relationship between the zeroes and the coefficients. 3  
 Or  
 (b) Find the nature of the roots of the quadratic equation,  $x^2 - 6x + 5 = 0$ . If the real roots exist, find them. 3
10. Solve the following pair of linear equations by substitution method: 3  

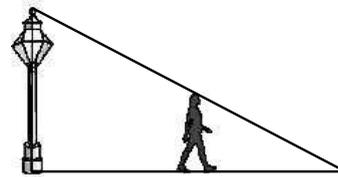
$$\frac{3x}{2} - \frac{5y}{3} = -2, \quad \frac{x}{3} + \frac{y}{2} = \frac{13}{6}$$
11. If the 3<sup>rd</sup> and the 9<sup>th</sup> terms of an AP are 4 and -8 respectively, which term of this AP is zero? 3
12. a. Evaluate  $\frac{5 \cos^2 60^\circ + 4 \sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$  3  
 Or  
 b. Prove that :  $\frac{1 + \sec A}{\sec A} = \frac{\sin^2 A}{1 - \cos A}$ , where  $\angle A$  is acute.
13. A 1.5 m tall boy is standing at some distance from a 30 m tall building. The angle of elevation from his eyes to the top of the building increases from  $30^\circ$  to  $60^\circ$  as he walks towards the building. Find the distance he walked towards the building. 3

14. The Class X students of a school, have been allotted a rectangular plot of land for their gardening activity. Sapling of Pine trees are planted on the boundary at a distance of 1 m from each other. There is a triangular grassy lawn in the plot, as shown in the figure.



- (i) Taking A as origin and AD as  $x$ -axis, find the coordinates of the vertices of the triangular plot.  
 (ii) Find the coordinates of the midpoint of side PR. 3

15. a. A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.



**Or**

- b. ABCD is a trapezium in which  $AB \parallel DC$  and its diagonals intersect each other at the point O. Show that  $\frac{AO}{BO} = \frac{CO}{DO}$  3

16. a. Prove that the lengths of tangents drawn from an external point to a circle are equal.

**Or**

- b. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line-segment joining the points of contact at the centre. 3

17. a. A chord of a circle of radius 15 cm subtends an angle of  $60^\circ$  at the centre. Find the areas of the corresponding minor and major segments of the circle. [Take  $\pi = 3.14$  and  $\sqrt{3} = 1.73$ ]

**Or**

- b. Rachel, an engineering student, was asked to make a model shaped like a cylinder with two cones attached at its two ends by using a thin aluminium sheet. The diameter of the model is 3 cm and its length is 12 cm. If each cone has a height of 2 cm, find the volume of air contained in the model that Rachel made. [Take  $\pi = \frac{22}{7}$ ] 3

18. Find out the mean concentration of  $SO_2$  in the air (in parts per million, i.e., ppm) for 30 localities using Step-deviation method, the data of which is below: 3

Concentration of $SO_2$ (in ppm)	0.00-0.04	0.04-0.08	0.08-0.12	0.12-0.16	0.16-0.20	0.20-0.24
Frequency	4	9	9	2	4	2

19. a. The given distribution shows the number of runs scored by some top batsmen of the world in one-day international cricket matches. Find the mode of the data.

Runs scored	3000 - 4000	4000 - 5000	5000 - 6000	6000 - 7000	7000 - 8000	8000 - 9000	9000 - 10000	10000-11000
Number of batsmen	4	18	9	7	6	3	1	1

**Or**

**3**

- b. The lengths of 40 leaves of a plant are measured correct to the nearest millimeter, and the data obtained is represented in the following table:

Length (in mm)	118-126	127-135	136-144	145-153	154-162	163-171	172-180
Number of leaves	3	5	9	12	5	4	2

Find the median length of the leaves.

20. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears: (i) a two-digit number, (ii) a perfect square number, (iii) a number divisible by 5.

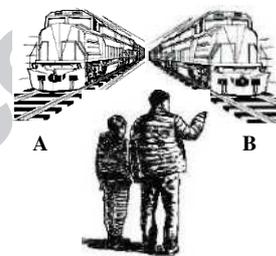
**3**

**Section – D**

21. Answer any one from the following questions (a) to (c):

**5**

- a. Avibu went travelling by train with his father who is an expert in Mathematics. He told Avibu that path of train A is given by the equation  $2x + 4y = 8$  and path of train B is given by the equation  $3x + 6y = 18$ . Help Avibu solve the following questions:



- (i) Represent the two equations graphically.  
 (ii) Write the coordinates of the point where the line  $2x + 4y = 8$  intersects the  $x$ -axis.  
 (iii) Write the coordinates of the point where the line  $3x + 6y = 18$  intersects the  $y$ -axis.

**Or**

- b. John was asked to represent the following statement in the form of a quadratic equation:

**The sum of two numbers is 9. The sum of their reciprocals is  $\frac{1}{2}$ .**

- (i) If John wrote the equation correctly, what would he have written?  
 (ii) Find the values of the two numbers.  
 (iii) Also, verify that the sum of the reciprocals of the two numbers is  $\frac{1}{2}$ .

**Or**

- c. Avika's mother opened a new shoe shop. To display the shoes, she put 3 pairs of shoes in 1<sup>st</sup> row, 5 pairs in 2<sup>nd</sup> row, 7 pairs in 3<sup>rd</sup> row and so on. On the basis of the above information, answer the following questions:



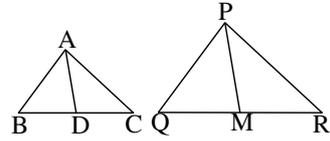
- (i) If she puts a total of 120 pairs of shoes, what is the required number of rows?  
 (ii) What is the difference of pairs of shoes in the 17<sup>th</sup> row and 10<sup>th</sup> row?

22. Answer any one from the following questions (a) to (c): 5

a. State and prove Thales Theorem.

**Or**

b. Sides AB and BC and median AD of a triangle ABC are respectively proportional to sides PQ and QR, and median PM of  $\Delta PQR$ . Show that  $\Delta ABC \sim \Delta PQR$



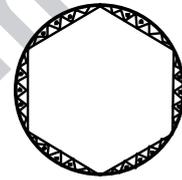
**Or**

c. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

23. Answer any one from the following questions (a) to (c): 5

a. A round table cover has six equal designs as shown in figure. If the radius of the cover is 28 cm, find the costs of making the designs at the rate of ` 0.35 per  $\text{cm}^2$ .

[Take  $\pi = \frac{22}{7}$  and  $\sqrt{3} = 1.73$ ]



**Or**

b. A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively, and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Also, find the cost of the canvas of the tent at the rate of ` 500 per  $\text{m}^2$ . [Take  $\pi = \frac{22}{7}$ ]

**Or**

c. A solid consisting of a right circular cone of height 120 cm and radius 60 cm standing on a hemisphere of radius 60 cm is placed upright in a right circular cylinder full of water such that it touches the bottom. Find the volume of water left in the cylinder, if the radius of the cylinder is 60 cm and its height is 180 cm. [Take  $\pi = \frac{22}{7}$ ]

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