

**General Instructions:**

1. Attempt all questions from section A
2. Attempt any 4 complete questions from section B
3. All working, including rough work, must be clearly shown and must be done on the Same sheet as the rest of the answer.
4. Omission of essential working will result in loss of marks.
5. Use graph sheet wherever necessary.

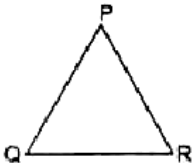
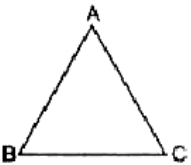
**Section – A**

**Attempt all questions from this section**

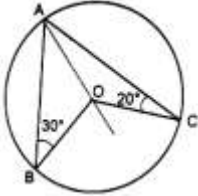
**Q1. Multiple choice Questions: –**

**[15]**

1. Ashi deposits ₹ 2,500 per month for one year in a bank's recurring deposit account. If the rate of (simple) interest is 8% per annum, then the interest earned by her is:  
(a) ₹ 650                      (b) ₹ 1,200                      (c) ₹ 1,300                      (d) ₹ 1,260
2. The roots of the quadratic equation  $3x^2 - 14x + 8 = 0$  are:  
(a)  $\frac{1}{3}$ , 2                      (b)  $\frac{1}{2}$ , 3                      (c)  $\frac{2}{3}$ , 4                      (d)  $\frac{3}{4}$ , 2
3. If  $(x + 2)$  is a factor of  $3x^3 - x^2 - px - 4$ , then the value of  $p$  is :  
(a) 14                      (b) 12                      (c) 10                      (d) 16
4. If  $\begin{bmatrix} 1 & -2 \\ 8 & x \end{bmatrix} - \begin{bmatrix} 1 & -2 \\ 8 & 6 \end{bmatrix}$ , then  $x$  is equal to:  
(a) 6                      (b)  $\pm 6$                       (c) -6                      (d) 0
5. 30th term of the A.P. : 10, 7, 4, ....., is:  
(a) 97                      (b) 77                      (c) -77                      (d) -87
6. An equation with one variable in which the highest power of the variable is two is known as .....  
(a) Linear equation                      (b) Cubic equation  
(c) Quadratic equation                      (d) None of these
7. If in two triangles ABC and PQR,  $\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$  then:  

  
 (a)  $\triangle PQR \sim \triangle CAB$                       (b)  $\triangle CBA \sim \triangle PQR$   
 (c)  $\triangle PQR \sim \triangle ABC$                       (d)  $\triangle BCA \sim \triangle PQR$
8. If radius of a cone is 21 cm and height 42 cm, find the volume of the cone.  
(a) 19,404 cm<sup>3</sup>                      (b) 15,512 cm<sup>3</sup>  
(c) 17,205 cm<sup>3</sup>                      (d) 14,984 cm<sup>3</sup>

9. If a pair of dice is tossed, the probability of getting the sum of the numbers on the top more than 12 is:  
 (a) 1 (b)  $\frac{1}{36}$  (c)  $\frac{1}{2}$  (d) 0
10. Which of the following is not a linear inequality ?  
 (a)  $ax^2 + bx + c < 0$  (b)  $ax + b < 0$   
 (a)  $ax + by + c \geq 0$  (b)  $ax + by + c \leq 0$
11. The ratio in which the line segment joining of  $(-1, 3)$  and  $(4, 2)$  divided by the y-axis is:  
 (a) 1:2 (b) 1:4 (c) 2:1 (d) 4:1
12. In the given figure O is the centre of the circle and  $\angle OBA = 30^\circ$  and  $\angle OCA = 20^\circ$ , find  $\angle BOC$ .  
 (a)  $100^\circ$  (b)  $110^\circ$   
 (c)  $120^\circ$  (d)  $130^\circ$
- 
13. In a frequency distribution mid value of a class is 10 and the class width is 6, then the lower limit of the class is:  
 (a) 4 (b) 7 (c) 5 (d) 3
14. If a card is drawn from a well-shuffled deck of 52 cards, what is the probability of drawing a Jack ?  
 (a)  $\frac{1}{4}$  (b)  $\frac{1}{2}$  (c)  $\frac{1}{52}$  (d)  $\frac{1}{13}$
15. If a, 2, 10, b are in continued proportion, then the value of a and b, respectively are :  
 (a) 1, 5 (b) 0.4, 50 (c) 5, 40 (d) 2, 0.6

## Question 2

[12]

- 1) Amit deposited ₹800 per month in a Recurring Deposit Account for 1 year at the rate of 10% per annum. Find the amount Amit will get on maturity. [4]
- 2) Find  $x$  and  $y$ , if  $\begin{bmatrix} 2x & x \\ y & 3y \end{bmatrix} \begin{bmatrix} 3 \\ 2 \end{bmatrix} = \begin{bmatrix} 16 \\ 9 \end{bmatrix}$  [4]
- 3) Prove the identity :  $\frac{\sec \theta + 1 + \tan \theta}{\sec \theta + 1 - \tan \theta} = \frac{1 + \sin \theta}{\cos \theta}$  [4]

## Question 3

[13]

- 1) How many terms of the A.P. 9, 17, 25, ... must be taken so that their sum is 636? [4]
- 2) The line segment with end points  $(3, 4)$  and  $(14, -3)$  meets the x-axis at P. In what ratio, does P divides the line segment? Also, find the coordinates of P. [4]
- 3) Five years ago, a woman's age was the square of her son's age. Ten years hence, her age will be the twice of her son's age. Find: [5]
  - (i) the age of the son five years ago.
  - (iii) the present age of the woman.

## Section-B

Attempt any 4 out of 7 Questions

### Question 4

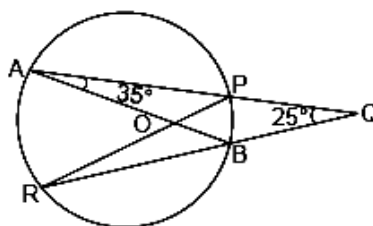
[10]

- 1) Find the value of ' $k$ ' if  $(x - 2)$  is a factor of  $x^3 + 2x^2 - kx + 10$ . Hence, determine whether  $(x + 5)$  is also a factor. [3]
- 2) Solve the following in equation and represent the solution set on the number line: [3]  
 $2y - 3 \leq y + 1 \leq 4y + 7, y \in \mathbb{R}$ .
- 3) A manufacturer sells a washing machine to a wholesaler for Rs 15000. The wholesaler [4]  
 Sells it to a trader at a profit of Rs.1200 and the trader sells it to a consumer at a profit of Rs.1800. If all the sales are intra-state and the rate of GST is 12%, find:
  - (i) The amount of tax (under GST) received by the State Government from the wholesaler.
  - (ii) The amount of tax (under GST) received by the Central Government from the trader.
 The amount that the consumer pays for the machine.

### Question 5

[10]

- 1) AB is a diameter of the circle as shown in the figure, APQ and RBQ are straight lines. Find: (i)  $\angle PRB$  (ii)  $\angle PBR$  (iii)  $\angle BPR$  [3]

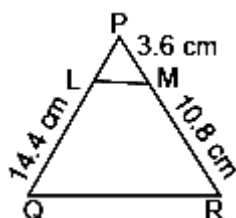


- 2) Are the numbers 6, 10, 14 and 22 in proportion? If no, then what must be added to each of them, to make them in proportion. [3]
- 3) Determine the ratio in which the line  $3x + y - 9 = 0$  divides the segment joining the points (1, 3) and (2, 7). [4]

### Question 6

[10]

- 1) In the given figure,  $LM \parallel QR$ . Find PL. [3]



- 2) Sanjay has a Recurring Deposit Account in a bank of ₹ 2,000 per month at the rate of 10% per annum. At the time of maturity, he receives ₹ 83,100. Find the time for which account was held [3]
- 3) Draw a circle of radius 3.5 cm. Mark a point P outside the circle at a distance of 6 cm from the centre. Construct two tangents from P to the given circle. Measure the length of one tangent. [4]

### Question 7

[10]

- 1) A bag contains 4 black, 6 white and 8 red balls. One ball is drawn at random from the bag. Find the probability that the ball drawn is:

- (i) white (ii) not red  
(iii) red or white (iv) red and white  
(v) neither black nor white (vi) either red or black.

- 2) Use graph paper for this question. [3]

Points A(2, 3), B(4, 5) and C(7, 2) are the vertices of  $\triangle ABC$ .

- (i) Write down the coordinates of A', B', C' if  $\triangle A'B'C'$  is the image of  $\triangle ABC$ , when reflected in the origin.  
(ii) Write down the coordinates of A'', B'', C'' if  $\triangle A''B''C''$  is the image of  $\triangle ABC$ , when reflected in the x-axis.  
(iii) Mention the special name of the quadrilateral BCC''B'' and find its area

- 3) Represent the following distribution by means of a histogram & find the Mode [4]

Age group (in years)	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25
Number of boys	300	980	800	580	290

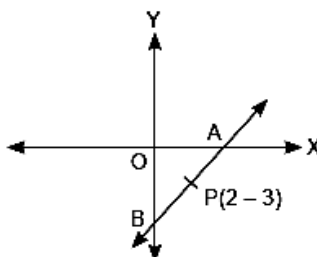
### Question 8

[10]

- 1) In a G.P. the ratio of the sum of first 3 terms is to that of first 6 terms is 125 : 152. Find the common ratio. [3]

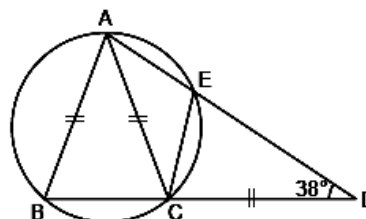
- 2) A and B are two points on the x-axis and y-axis respectively. If P(2, -3) is the mid-point of AB. Find: [3]

- (i) coordinates of A and B.  
(ii) slope of line AB.  
(iii) equation of line AB.



- 3) In the given figure, AB = AC = CD. If  $\angle ADC = 38^\circ$ , calculate: [4]

- (i)  $\angle ABC$  (ii)  $\angle BCE$



### Question 9

[10]

- 1) Draw the Ogive for the following data and find the Median [5]

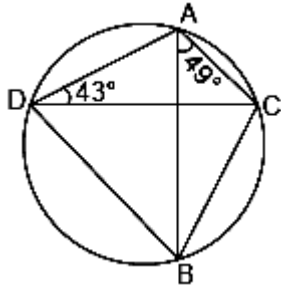
Heights (in cm)	121 - 130	131 - 140	141 - 150	151 - 160	161 - 170	171 - 180
Number of pupils	12	16	30	20	14	8

- 2) A cylindrical cistern whose radius is 7 cm is partly filled with water. If a conical block of iron whose radius of base is 3.5 cm and height is 6 cm is wholly immersed in the water, by how much will the water level rise? (Use  $\pi = 22/7$ ) [5]

**Question 10**

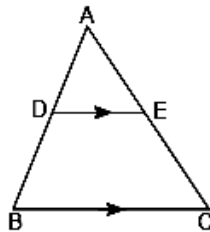
[10]

- 1) In the given figure, find: (i)  $\angle CDB$  (ii)  $\angle ABC$  (iii)  $\angle ACB$  [3]



- 2) In the given figure,  $DE \parallel BC$  and  $\frac{AD}{DB} = \frac{2}{3}$ . Calculate: [3]

- (i)  $\frac{\text{ar}(\triangle ADE)}{\text{ar}(\triangle ABC)}$   
(ii)  $\frac{\text{ar}(\text{trapezium } DECB)}{\text{ar}(\triangle ABC)}$



- 3) An aeroplane when 3000 metres high passes vertically above another aeroplane at an instant when their angles of elevation at the same observation point are  $60^\circ$  and  $45^\circ$  respectively. How many metres higher is the one than the other? [4]

