

# Sample Question Paper

## Section 'A'

Question numbers 1 to 10 carry 1 mark each

1. If an event that cannot occur, then its probability is :

- (a) 1 (b)  $\frac{3}{4}$   
 (c)  $\frac{1}{2}$  (d) 0 1

2. Consider the data

Class	65–85	85–105	105–125	125–145	145–165	165–185	185–205
Frequency	4	5	13	20	14	7	4

The difference of the upper limit of the median class and the lower limit of the modal class is :

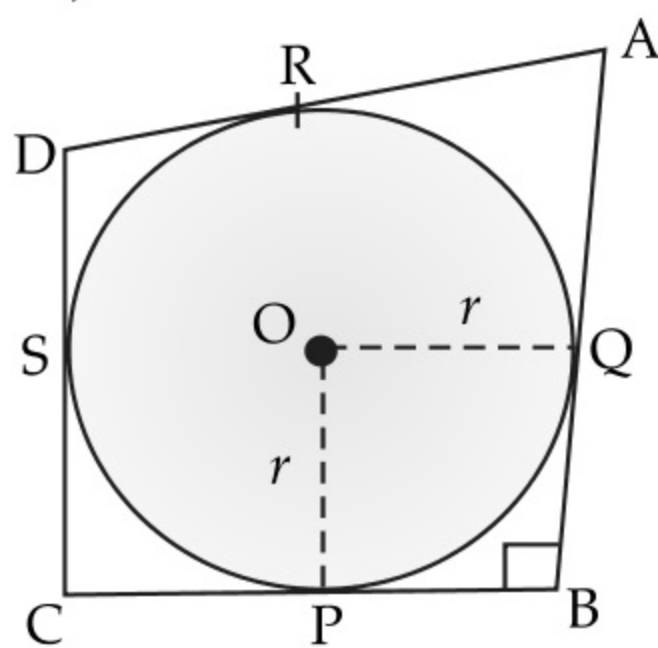
- (a) 0 (b) 19  
 (c) 20 (d) 38 1
3. It is proposed to build a single circular park equal in area to the sum of areas of two circular parks of diameters 16 m and 12 m in a locality. The radius of the new park would be :
- (a) 10 m (b) 15 m  
 (c) 20 m (d) 24 m 1
4. A pole 6 m high casts a shadow  $2\sqrt{3}$  m long on the ground, then the Sun's elevation is :
- (a)  $60^\circ$  (b)  $45^\circ$   
 (c)  $30^\circ$  (d)  $90^\circ$  1

OR

The angle of depression of a car parked on the road from the top of 150 m high tower is  $30^\circ$ . The distance of the car from the tower (in metres) is :

- (a)  $50\sqrt{3}$  (b)  $150\sqrt{3}$   
 (c)  $150\sqrt{2}$  (d) 75 1
5.  $(\sec A + \tan A)(1 - \sin A) =$
- (a)  $\sec A$  (b)  $\sin A$   
 (c)  $\operatorname{cosec} A$  (d)  $\cos A$  1
6. To construct a triangle similar to a given  $\Delta ABC$  with its side  $\frac{8}{5}$  of the corresponding sides of  $\Delta ABC$  draw a ray  $BX$  such that  $\angle CBX$  is an acute angle and  $X$  is on the opposite side of  $A$  with respect to  $BC$ . The minimum number of points to be located at equal distances on the ray  $BX$  :
- (a) 5 (b) 8  
 (c) 13 (d) 3 1

7. In figure, a circle with centre  $O$  is inscribed in a quadrilateral  $ABCD$  such that, it touches the sides  $BC$ ,  $AB$ ,  $AD$  and  $CD$  at points  $P$ ,  $Q$ ,  $R$  and  $S$  respectively. If  $AB = 29$  cm,  $AD = 23$  cm,  $\angle B = 90^\circ$  and  $DS = 5$  cm, then the radius of the circle (in cm.) is :



- (a) 11  
(c) 6

- (b) 18  
(d) 15

1

OR

In triangles  $ABC$  and  $DEF$ ,  $\angle B = \angle E$ ,  $\angle F = \angle C$  and  $AB = 3DE$ . Then, the two triangles are :

- (a) congruent but not similar  
(c) neither congruent nor similar
- (b) similar but not congruent  
(d) congruent as well as similar

1

**AI** 8. If the common difference of an A.P., is 5, then what is  $a_{18} - a_{13}$ ?

- (a) 5  
(c) 25
- (b) 20  
(d) 30

1

9. If the zeroes of the quadratic polynomial  $ax^2 + bx + c$ ,  $a \neq 0$  are equal, then :

- (a)  $c$  and  $a$  have opposite signs  
(c)  $c$  and  $a$  have the same sign
- (b)  $c$  and  $b$  have opposite signs  
(d)  $c$  and  $b$  have the same sign

1

10.  $AOBC$  is a rectangle whose three vertices are vertices  $A(0, 3)$ ,  $O(0, 0)$  and  $B(5, 0)$ . The length of its diagonal is :

- (a) 5  
(c)  $\sqrt{34}$
- (b) 3  
(d) 4

1

*Question numbers 11 to 20 carry 1 mark each*

11. Explain why 13233343563715 is a composite number ?

1

12. Find a rational number between  $\sqrt{2}$  and  $\sqrt{3}$ .

1

13. If one root of  $7x^2 + 16x + k = 0$  is the reciprocal of the other root, then find value of  $k$ .

1

14. For what value of  $k$ , do the equations  $3x - y + 8 = 0$  and  $6x - ky = -16$  represent coincident lines ?

1

OR

If the lines given by  $3x + 2ky = 2$  and  $2x + 5y + 1 = 0$  are parallel, then find the value of  $k$ .

1

15. Find the positive root of  $\sqrt{3x^2 + 6} = 9$ .

1

16. Is series  $\sqrt{3}, \sqrt{6}, \sqrt{9}, \sqrt{12}, \dots$  an A.P. ? Give reason.

1

17. Find the distance of the point  $(-4, -7)$  from the  $y$ -axis.

1

18. If triangle  $ABC$  is similar to triangle  $DEF$  such that  $2AB = DE$  and  $BC = 8$  cm, then find  $EF$ .

1

19. If a circle can be inscribed in a parallelogram how will the parallelogram change ?

1

20. If  $A$  and  $B$  are acute angles and  $\sin A = \cos B$ , then find the value of  $A + B$ .

1

## Section 'B'

Question numbers 21 to 26 carry 2 marks each

21. Explain whether  $3 \times 12 \times 101 + 4$  is a prime number or a composite number. 2
22. Find the values of  $a$  and  $b$ , if they are the zeroes of polynomial  $x^2 + ax + b$ . 2
- [AI]** 23. For what value of ' $k$ ', the system of equations  $kx + 3y = 1$ ,  $12x + ky = 2$  have no solution. 2

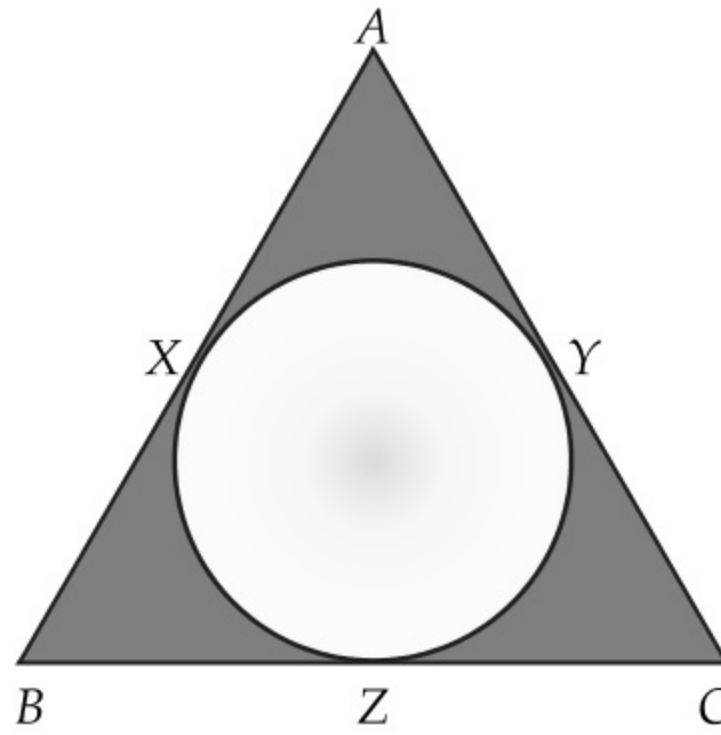
OR

Find the value of  $k$  for which the roots of the quadratic equation  $2x^2 + kx + 8 = 0$  will have the equal roots? 2

24. Find the 7<sup>th</sup> term from the end of A.P. 7, 10, 13, ..... 184. 2
25. Find the ratio in which  $y$ -axis divides the line segment joining the points  $A(5, -6)$  and  $B(-1, -4)$ . Also find the co-ordinates of the point of division. 2
26. In an equilateral triangle of side  $3\sqrt{3}$  cm, find the length of the altitude. 2

OR

$ABC$  is an isosceles triangle in which  $AB = AC$  which is circumscribed about a circle as shown in the figure. Show that  $BC$  is bisected at the point of contact.



2

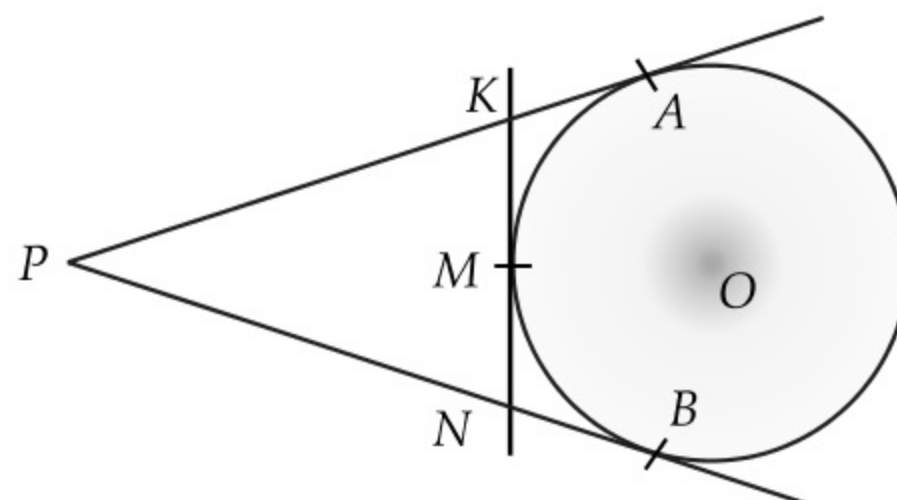
## Section 'C'

Question numbers 27 to 34 carry 3 marks each

27. Find the roots of the quadratic equation :  
 $a^2b^2x^2 + b^2x - a^2x - 1 = 0$  3
28. The 14<sup>th</sup> term of an A.P. is twice its 8<sup>th</sup> term. If the 6<sup>th</sup> term is  $-8$ , then find the sum of its first 20 terms. 3
29. In a trapezium  $ABCD$ , diagonals  $AC$  and  $BD$  intersect at  $O$ . If  $AB = 3CD$ , then find ratio of areas of triangles  $COD$  and  $AOB$ . 3

OR

In given figure,  $PA$  and  $PB$  are tangents from a point  $P$  to the circle with centre  $O$ . At the point  $M$ , another tangent to the circle is drawn cutting  $PA$  and  $PB$  at  $K$  and  $N$ . Prove that the perimeter of  $\Delta PNM = 2PB$ . 3



30. If  $4 \tan \theta = 3$ , evaluate  $\left( \frac{4 \sin \theta - \cos \theta + 1}{4 \sin \theta + \cos \theta - 1} \right)$  3

**OR**

An electric pole is 12 m high. A steel wire tied to top of the pole is affixed at a point on the ground to keep the pole upright. If the wire makes an angle of  $60^\circ$  with the horizontal through the foot of the pole, find the length of the wire. 3

31. The points  $A(1, -2)$ ,  $B(2, 3)$ ,  $C(k, 2)$  and  $D(-4, -3)$  are the vertices of a parallelogram. Find the value of  $k$ . 3
32. The mean of the following distribution is 48 and sum of all the frequencies is 50. Find the missing frequencies  $x$  and  $y$ .

Class	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
Frequency	8	6	$x$	11	$y$

33. A game consists of tossing a one-rupee coin 3 times and noting the outcome each time. Ramesh will win the game if all the tosses show the same result, (*i.e.* either all three heads or all three tails) and loses the game otherwise. Find the probability that Ramesh will lose the game. 3
34. In the figure,  $\triangle ACB$  is in the semi-circle. Find the area of shaded region given that  $AB = 42$  cm. 3

**OR**

The largest possible sphere is cut out from a wooden solid cube of side 7 cm. Find the volume of the wood left.  $\left[ \text{Use } \pi = \frac{22}{7} \right]$  3

## Section 'D'

Question numbers 35 to 40 carry 4 marks each

35. The following table gives the weight of 120 articles :

Weight (in kg)	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Number of students	14	17	22	26	23	18

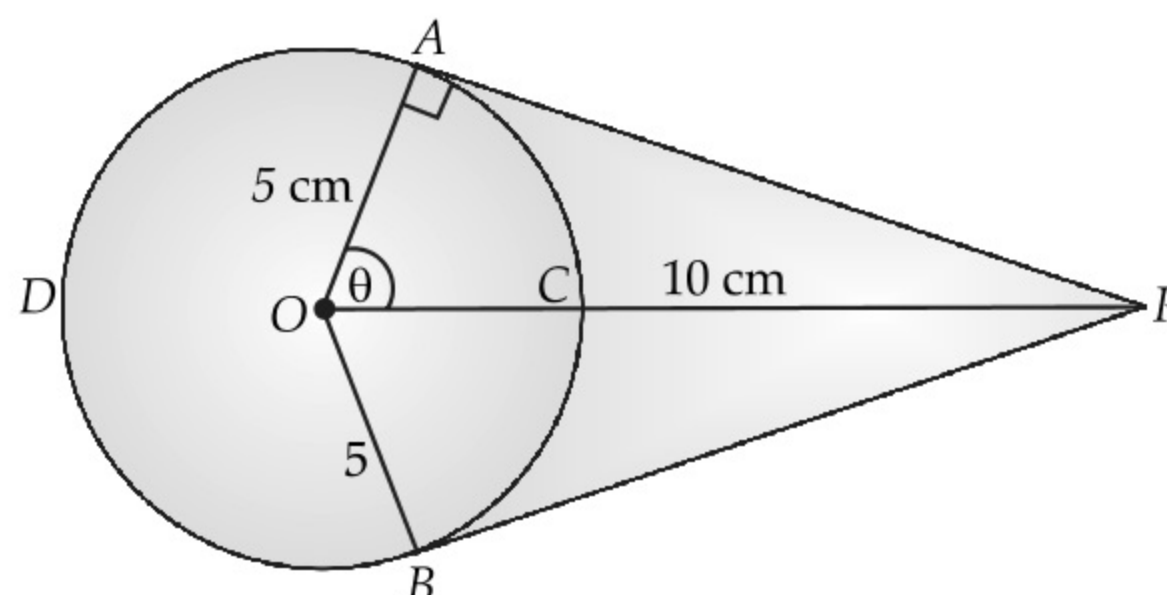
Change the distribution to a 'more than type' distribution and draw its ogive. 4

- [AI]** 36. The radii of the circular ends of a frustum of cone of height 6 cm are 14 cm and 6 cm respectively. Find the lateral surface area and total surface area of the frustum. 4

**OR**

An elastic belt is placed around the rim of a pulley of radius 5 cm. From one point  $C$  on the belt, elastic belt is pulled directly away from the centre  $O$  of the pulley until it is at  $P$ , 10 cm from the point  $O$ . Find the length of the belt that is still in contact with the pulley. Also find the shaded area.

(Use  $\pi = 3.14$  and  $\sqrt{3} = 1.73$ ) 4



37. Construct a triangle  $ABC$  with side  $BC = 7$  cm,  $\angle B = 45^\circ$ ,  $\angle A = 105^\circ$ . Then construct another triangle whose sides are  $\frac{3}{4}$  times of the corresponding sides of the  $\Delta ABC$ . 4

38. A man on the top of a vertical observation tower observes a car moving at uniform speed coming directly towards it. If it takes 12 minutes for the angle of depression to change from  $30^\circ$  to  $45^\circ$ , how long will the car take to reach the observation tower from this point? 4

OR

Prove that :  $\frac{\tan \theta + \sin \theta}{\tan \theta - \sin \theta} = \frac{\sec \theta + 1}{\sec \theta - 1}$ . 4

39. The numerator of a fraction is 3 less than its denominator. If 2 is added to both the numerator and the denominator, then the sum of the new fraction and original fraction is  $\frac{29}{20}$ . Find the original fraction. 4

40. Two tangents  $PA$  and  $PB$  are drawn from an external point  $P$  to a circle with centre  $O$ , such that  $\angle APB = \angle x$  and  $\angle AOB = y$ . Prove that opposite angles are supplementary. 4

OR

In  $\Delta ABC$ , the mid-points of sides  $BC$ ,  $CA$  and  $AB$  are  $D$ ,  $E$  and  $F$  respectively. Find ratio of  $ar(\Delta DEF)$  to  $ar(\Delta ABC)$ . 4

