

Self Assessment Paper

Section 'A'

Question numbers 1 to 10 carry 1 mark each

1. The times, in seconds, taken by 150 athletes to run a 110 m hurdle race is tabulated below :

Class	13.8–14	14–14.2	14.2–14.4	14.4–14.6	14.6–14.8	14.8–15
Frequency	2	4	5	71	48	20

The number of athletes who completed the race in less than 14.6 seconds is :

- (a) 11 (b) 71
(c) 82 (d) 130 1

2. If the sum of the areas of two circles with radii R_1 and R_2 is equal to the area of a circle of radius R , then :

- (a) $R_1 + R_2 = R$ (b) $R_1^2 + R_2^2 = R^2$
(c) $R_1 + R_2 < R$ (d) $R_1^2 + R_2^2 < R^2$ 1

OR

In a right circular cone, the cross-section made by a plane parallel to the base is a :

- (a) circle (b) frustum of a cone
(c) sphere (d) hemisphere

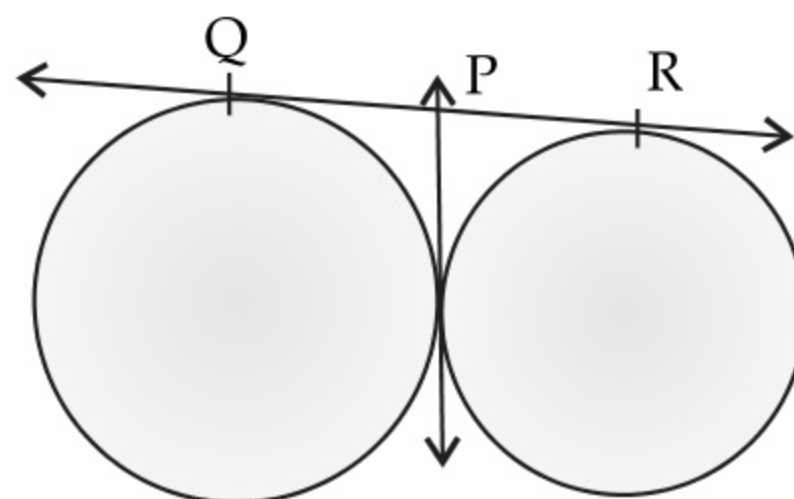
3. Given that $\sin \theta = \frac{a}{b}$ then $\cos \theta$ is equal to

- (a) $\frac{b}{\sqrt{b^2 - a^2}}$ (b) $\frac{b}{a}$
(c) $\frac{\sqrt{b^2 - a^2}}{b}$ (d) $\frac{a}{\sqrt{b^2 - a^2}}$ 1

4. In an A.P, if $d = -4$, $n = 7$, $a_n = 4$, then a is;

- (a) 6 (b) 7
(c) 20 (d) 28 1

5. In figure, OR is common tangent to the given circles, touching externally at the point T . The tangent at T meets QR at P . If $PT = 3.8$ cm, then the length of QR (in cm) is :



- (a) 3.8 (b) 7.6
(c) 5.7 (d) 1.9 1

6. Tick the correct answer and justify : In ΔABC , $AB = 6\sqrt{3}$ cm, $AC = 12$ cm and $BC = 6$ cm. The angle B is :
- (a) 120° (b) 60°
(c) 90° (d) 45° 1
7. If the point C ($k, 4$) divides the join of points A(2, 6) and B (5, 1) in the ratio 2 : 3, then the value of k is :
- (a) 16 (b) $\frac{28}{5}$
(c) $\frac{16}{5}$ (d) $\frac{8}{5}$ 1
8. What is the common difference of an A.P, in which $a_{18} - a_{14} = 32$?
- (a) 8 (b) -8
(c) -4 (d) 4 1
9. Values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is :
- (a) 0 only (b) 4
(c) 8 only (d) 0, 8 1

OR

$(x^2 + 1)^2 - x^2 = 0$ has

- (a) four real roots (b) two real roots
(c) no real roots (d) one real root.

10. The decimal expansion of the rational number $\frac{14587}{1250}$ will terminate after :
- (a) one decimal place. (b) two decimal places.
(c) three decimal places. (d) four decimal places. 1

Question numbers 11 to 20 carry 1 mark each

11. 20 tickets, on which numbers 1 to 20 are written, are mixed thoroughly and then a ticket is drawn at random out of them. Find the probability that the number on the drawn ticket is a multiple of 3 or 7. 1
12. What is the value of $(\cos^2 67^\circ - \sin^2 23^\circ)$? 1
13. What is the maximum number of parallel tangents a circle can have on a diameter ? 1
14. If the n th term of an A.P. $-1, 4, 9, 14, \dots$ is 129. Find the value of n . 1
15. In ΔABC , if X and Y are points on AB and AC respectively such that $\frac{AX}{XB} = \frac{3}{4}$, $AY = 5$ and $YC = 9$, then state whether XY and BC parallel or not. 1
16. Find the perpendicular distance of $A(5, 12)$ from the y -axis. 1
- AI** 17. If 18, $a, b, -3$ are in A.P., then find $a + b$. 1
18. Find k so that the quadratic equation $(k + 1)x^2 - 2(k + 1)x + 1 = 0$ has equal roots. 1

OR

If one root of the quadratic equation $6x^2 - x - k = 0$ is $\frac{2}{3}$, then find the value of k .

19. A cylinder, a cone and a hemisphere have same base and same height. Find the ratio of their volumes. 1
20. After how many decimal places will the decimal expansion of $\frac{23}{2^4 \times 5^3}$ terminate ? 1

Section 'B'

Question numbers 21 to 26 carry 2 marks each

21. Harpreet tosses two different coins simultaneously. What is the probability that she gets :

- (i) at least one head ?
 (ii) one head and one tail ?

2

OR

Find the mean of first five odd multiples of 5.

22. If $\sin A = \frac{\sqrt{3}}{2}$, then find the value of $2\cot^2 A - 1$.

2

23. Find the point on the x -axis which is equidistant from the points $(2, -5)$ and $(-2, 9)$.

2

24. If five times the fifth term of an A.P. is equal to eight times its eighth term, show that its 13th term is zero.

2

25. If p and q are the zeroes of polynomial

$$f(x) = 2x^2 - 7x + 3, \text{ find the value of } p^2 + q^2.$$

2

OR

If $x = \frac{2}{3}$ and $x = -3$ are roots of the quadratic equation $ax^2 + 7x + b = 0$, find the values of a and b .

26. Solve : $99x + 101y = 499$ and $101x + 99y = 501$.

2

Section 'C'

Question numbers 27 to 34 carry 3 marks each

27. Three bells toll at intervals of 9, 12, 15 minutes respectively. If they start tolling together, after what time will they next toll together ?

3

28. Find the values of p for which the quadratic equation $4x^2 + px + 3 = 0$ has equal roots.

3

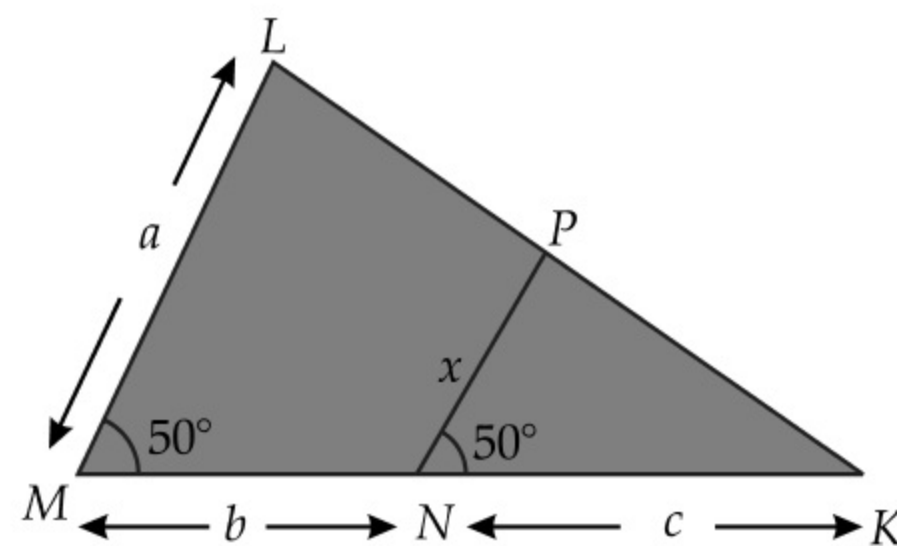
OR

[AI] The p^{th} , q^{th} and r^{th} terms of an A.P. are a , b and c respectively. Show that $a(q - r) + b(r - p) + c(p - q) = 0$.

29. If the distance of $P(x, y)$ from $A(6, 2)$ and $B(-2, 6)$ are equal, prove that $y = 2x$.

3

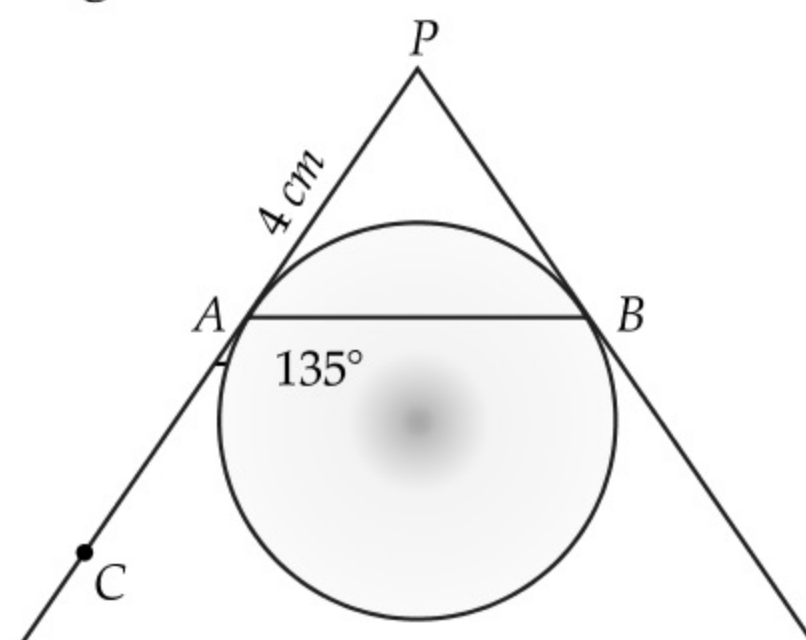
30. In the given figure, find the value of x in terms of a , b and c .



3

OR

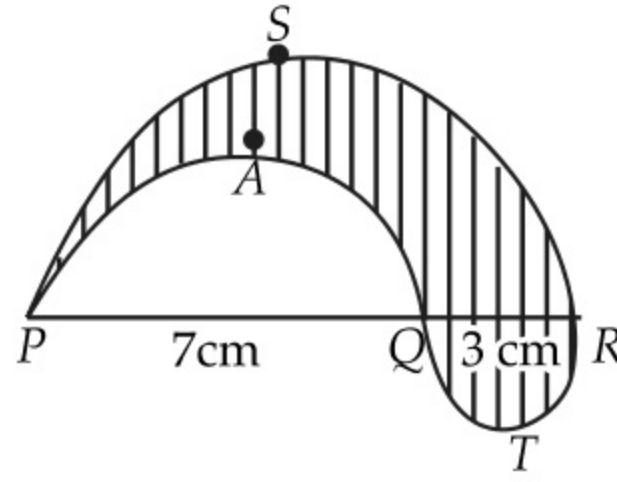
In the given figure, PA and PB are tangents to a circle from an external point P such that $PA = 4$ cm and $\angle BAC = 135^\circ$. Find the length of chord AB .



31. Prove that $\sin\theta (1 + \tan\theta) + \cos\theta (1 + \cot\theta) = \sec\theta \operatorname{cosec}\theta$. 3

32. In the fig., PSR , RTQ and PAQ are three semi-circles of diameters 10 cm, 3 cm and 7 cm respectively.

Find the perimeter of shaded region. $\left(\text{Use } \pi = \frac{22}{7} \right)$

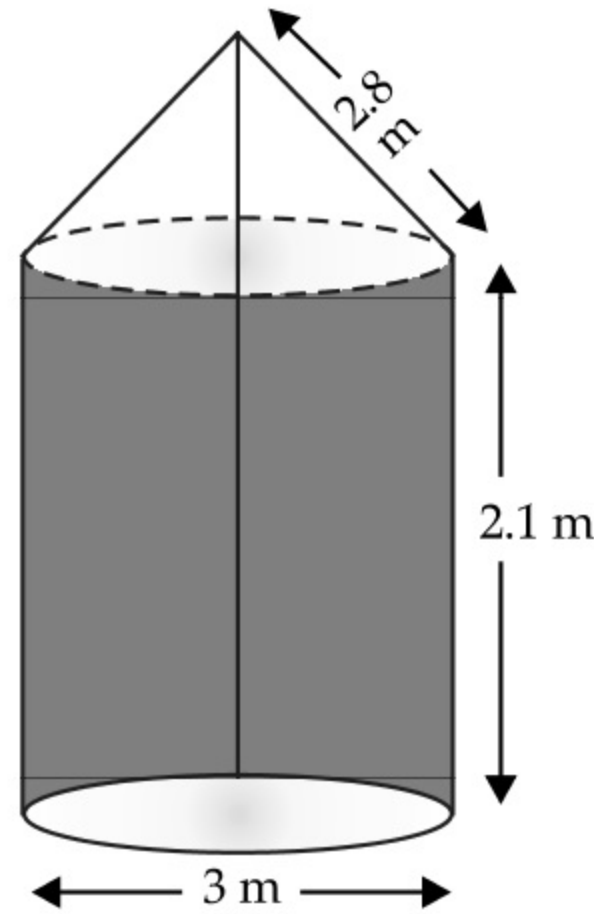


3

OR

In the given figure, a tent is in the shape of a cylinder surmounted by a conical top of same diameter. If the height and diameter of cylindrical part are 2.1 m and 3 m respectively and the slant height of conical part is 2.8 m, find the cost of canvas needed to make the tent if the canvas is available at the rate of ₹ 500 per sq. metre.

$\left[\text{Use } \pi = \frac{22}{7} \right]$



33. Following frequency distribution shows the daily expenditure on milk of 30 households in a locality :

Daily expenditure on milk (in ₹)	0 – 30	30 – 60	60 – 90	90 – 120	120 – 150
Number of households	5	6	9	6	4

Find the mode for the above data.

3

34. A box contains 100 cards marked from 1 to 100. If one card is drawn at random from the box, find the probability that it bears :

- (i) a single digit number
- (ii) a number which is a perfect square
- (iii) a number which is divisible by 7.

3

Section 'D'

Question numbers 35 to 40 carry 4 marks each

35. The following distribution gives the distribution of life times of washing machines of a certain company :

Life time (in hours)	1000–1200	1200–1400	1400–1600	1600–1800	1800–2000	2000–2200	2200–2400
Number of washing machines	15	60	68	86	75	61	45

Convert the above distribution into 'less than type' and draw its ogive. 4

36. Two circular beads of different sizes are joined together such that the distance between their centres is 14 cm. The sum of their areas is $130\pi \text{ cm}^2$. Find the radius each bead. 4

OR

A well of diameter 4 m is dug 14 m deep. The earth taken out is spread evenly all around the well to form a 40 cm high embankment. Find the width of the embankment.

37. The angle of elevation of the top of a tower at a distance of 120 m from a point A on the ground is 45° . If the angle of elevation of the top of a flagstaff fixed at the top of the tower, at A is 60° , then find the height of the flagstaff. [Use $\sqrt{3} = 1.73$] 4

OR

From the top of a building 60 m high the angles of depression of the top and the bottom of a tower are observed to be 30° and 60° . Find the height of the tower.

38. Draw a right triangle in which sides (other than hypotenuse) are 8 cm and 6 cm. Then construct another triangle whose sides are $\left(\frac{3}{4}\right)$ times the (corresponding) sides of given triangle. 4

39. An arithmetic progression 5, 12, 19, ... has 50 terms. Find its last term. Hence find the sum of its last 15 terms. 4

40. The length of the sides forming right angle of a right triangle are $5x$ cm and $(3x - 1)$ cm. If the area of the triangle is 60 cm^2 . Find its hypotenuse. 4

OR

[AI] Solve the following pair of equations graphically :

$$2x + 3y = 12 \text{ and } x - y - 1 = 0.$$

Shade the region between the two lines represented by the above equations and the X-axis.