

General Instructions:

1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.

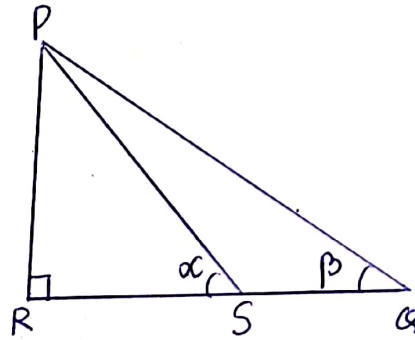
Section-A

1. If $HCF(98, 28) = m$ and $LCM(98, 28) = n$, then the value of $n - 7m$ is
a) 0 b) 28 c) 98 d) 198
2. The roots of the equation $3x^2 - 4x + 3 = 0$ are
a) real and unequal b) real and equal c) not real d) does not exist
3. If the system of equations $3x + y = 1$; $(2k - 1)x + (k - 1)y = 2k + 1$ is inconsistent, then k is
a) 1 b) -1 c) -3 d) 2
4. If $p - 1, p + 3$ and $3p - 1$ are in A.P. then p is
a) 4 b) 2 c) -4 d) -2
5. If $\sin \theta = \frac{11}{15}$ then $\cos \theta =$
a) $\frac{2\sqrt{26}}{15}$ b) $\frac{15\sqrt{26}}{2}$ c) $\frac{15}{11}$ d) $\frac{11}{15}$
6. In $\triangle ABC, DE \parallel BC$ if $AD = 4x - 3$, $AE = 8x - 7$, $BD = 3x - 1$ and $CE = 5x - 3$ then x is
a) $\frac{1}{2}$ b) 1 c) $-\frac{1}{2}$ d) $1, -\frac{1}{2}$
7. AT is a tangent to the circle with centre O such that $OT = 4\text{cm}$, $\angle OTA = 30^\circ$, then AT is
a) 4 cm b) 2 cm c) $2\sqrt{3}\text{ cm}$ d) $4\sqrt{3}\text{ cm}$
8. A copper wire when bent in the form of a square encloses an area of 484 cm^2 . The same wire is now bent in the form of a circle. Find the area of the circle.
a) 116 cm^2 b) 616 cm^2 c) 166 cm^2 d) 154 cm^2

B-1

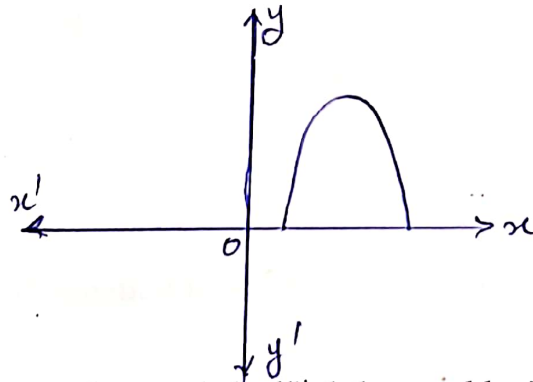
10. If the distance between the points $(3, -5)$ and $(x, -5)$ is 15 units, then the values of x are
 a) 12, -8 b) -12, 18 c) 18, 5 d) -9, -12
11. If $\cos(\alpha + \beta) = 0$ then the value of $\cos\left(\frac{\alpha + \beta}{2}\right)$ is
 a) $\frac{1}{\sqrt{2}}$ b) $\frac{1}{2}$ c) 0 d) 1
12. If middle most observation of every data arranged in order is called
 a) median b) mode c) mean d) deviation
13. If $(-1)^n + (-1)^8 = 0$, then n is
 a) any positive integer b) any negative integer c) any odd number d) any even number
14. M is a mid point on y -axis at a distance of 4 units from x -axis and it lies below the x -axis. The distance of point M from point Q (5, 1) is
 a) $\sqrt{2}$ units b) $\sqrt{34}$ units c) $\sqrt{50}$ units d) $\sqrt{90}$ units
15. Find the value of $\frac{\tan \alpha}{\tan \beta}$ from the following diagram. It is given that $RS : SQ = 1 : 2$

- a) 1
 b) 2
 c) 3
 d) 4



16. If the given figure shows the graph of polynomial $y = ax^2 + bx + c$ then

- a) $a < 0$
 b) $b^2 < 4ac$
 c) $c > 0$
 d) a & b are of same sign



17. Cards numbered 10, 11, 12, 30 are kept in a box and shuffled thoroughly. Rohit draws a card at random from the box. The probability that the number on the card is a multiple of 4 or 5 is:

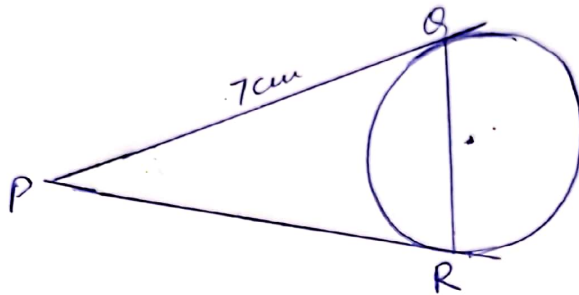
- a) $\frac{9}{20}$ b) $\frac{9}{21}$ c) $\frac{10}{20}$ d) $\frac{10}{21}$

B-2

8. In given figure PQ and PR are tangents to the circle

The length of the chord is

- a) 5 cm
- b) 7 cm
- c) 9 cm
- d) 14 cm



19. Statement A (Assertion) : Three unbiased coins are tossed together, then the probability of getting exactly 1 head is $\frac{3}{8}$
 Statement R (Reason) : Favourable number of outcomes do not lie in the simple space of total number of outcomes.
- a) Both A and R are true and Reason (R) is correct explanation of A
 - b) Both A and R are true but Reason (R) is not the correct explanation of A
 - c) A is true but R is false
 - d) A is false but R is true

20. Statement A (Assertion) : If length of minute hand of a clock is 7 cm then area swept by it in 5 min is $\frac{77}{6} \text{ cm}^2$

Statement R (Reason) : The length of arc of a sector of angle θ and radius r is given by

$$l = \frac{\theta}{360} \times 2\pi r$$

- a) Both A and R are true and Reason (R) is correct explanation of A
- b) Both A and R are true but Reason (R) is not the correct explanation of A
- c) A is true but R is false
- d) A is false but R is true

Section - B

21. Find a quadratic polynomial in x , whose one zero is 15 and sum of the zeroes is 42.

OR

α, β are the zeros of the quadratic polynomial $p(x) = x^2 - 4x + k$, such that $\alpha - \beta = 8$. Find the value of k

22. How many terms of the arithmetic progression 45, 39, 33, must be taken so that their sum is 180?

23. Find the value of 'c' for which the quadratic equation $(c + 1)x^2 - 6(c + 1)x + 3(c + 9) = 0$; $c \neq -1$ has real and equal roots.

24. Prove the following identity

$$\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A$$

B-3

25. If the total surface area of a solid hemisphere is 462 cm^2 , find its volume ($\pi = \frac{22}{7}$)

Section - C

26. Find the largest number that will divide 398, 436 and 542 leaving remainders 7, 11 and 15 respectively.
27. Solve the following pair of equations by Elimination Method :

$$\frac{x}{2} + \frac{2y}{3} = -1$$
$$x - \frac{y}{6} = 3$$

OR

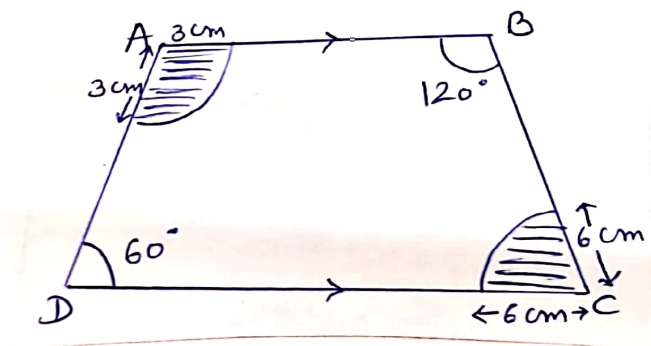
The ratio of incomes of two persons is $9 : 7$ and the ratio of their expenditures is $4 : 3$. If each of them manages Rs. 2,000 per month, find their monthly incomes.

28. Find the ratio in which $P(4, m)$ divides the line segment joining the points $A(2, 3)$ and $B(6, -3)$. Hence find m .

29. 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-post is 3.6 m above the ground, find the length of her shadow.

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

31. In the given figure, ABCD is a trapezium with $AB \parallel DC$. Find the area of the shaded region (keep the answer in π)



B-4

Section - D

32. Find a natural number whose square diminished by 84 is equal to thrice of 8 more than the given number.

OR

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

33. a) Prove that if a line is drawn parallel to one side of a triangle intersecting the other two sides of the triangle, then the other two sides are divided in the same ratio.
- a) In a $\triangle ABC$, if $\frac{AD}{DC} = \frac{BE}{EC}$ and $\angle CDE = \angle CED$, prove that $\triangle ABC$ is isosceles.
34. One card is drawn from a well shuffled deck of 52 cards, find the probability of getting
- A red face card
 - black and a king
 - either red or a king
 - '10' of black suit
 - an ace
35. Find the missing frequencies in the following frequency distribution table, it being given that the mean of this distribution is 50.

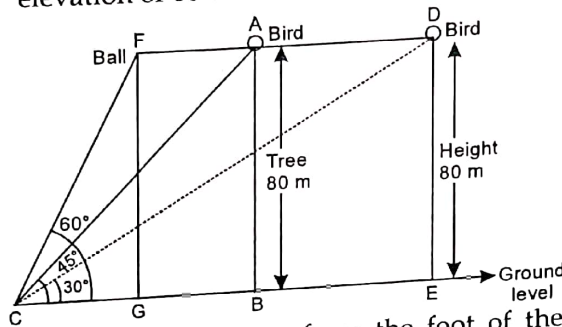
Class interval	0-20	20-40	40-60	60-80	80-100	Total
Frequency	17	x	32	y	19	120

B-5

Q36. Case Study 1.

One evening, Kaushik was in a park. Children were playing cricket. Birds were singing on a nearby tree of height 80 m. He observed a bird on the tree at an angle of elevation of 45° .

When a sixer was hit, a ball flew through the tree frightening the bird to fly away. In 2 seconds, he observed the bird flying at the same height at an angle of elevation of 30° and the ball flying towards him at the same height at an angle of elevation of 60° .



- (i) At what distance from the foot of the tree was he observing the bird sitting on the tree?
- (ii) How far did the bird fly in the mentioned time?

Or

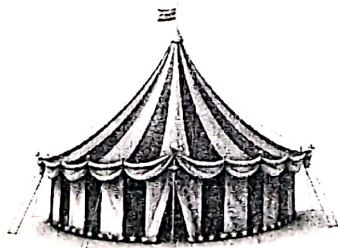
After hitting the tree, how far did the ball travel in the sky when Kaushik saw the ball?

- (iii) What is the speed of the bird in m/min if it had flown $20(\sqrt{3} + 1)$ m?

Q37. Case Study 2.

The word 'circus' has the same root as 'circle'. In a closed circular area, various entertainment acts including human skill and animal training are presented before the crowd.

A circus tent is cylindrical up to a height of 8 m and conical above it. The diameter of the base is 28 m and total height of tent is 18.5 m.



Based on the above information, solve the following questions:

- Q1. Find slant height of the conical part.
- Q2. Determine the floor area of the tent.
- Q3. Find area of the cloth used for making tent.

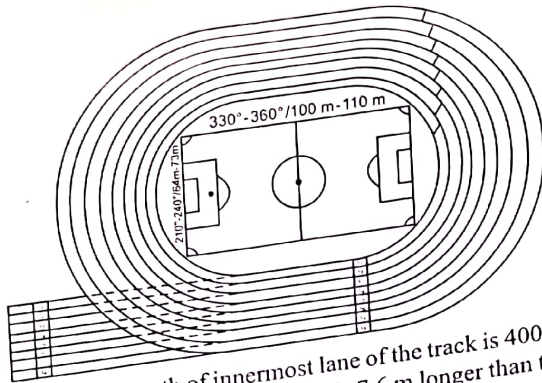
Or

Find total volume of air inside an empty tent.

B-6

Case Study 3.

In order to organize, Annual Sports Day, a school prepared an eight lane running track with an integrated football field inside the track area as shown ahead :



The length of innermost lane of the track is 400 m and each subsequent lane is 7.6 m longer than the preceding lane.

Based on the given information, solve the following questions: [CBSE 2025]

- Q 1. What is the length of the 6th lane?
- Q 2. How long is the 8th lane than that of 4th lane?
- Q 3. While practicing for a race, a student took one round each in first six lanes. Find the total distance covered by the student.

Or

A student took one round each in lane 4 to lane 8. Find the total distance covered by the student.

B-7