PRINCE ACADEMY
OF HIGHER EDUCATION
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SAMPLE PAPER - I : 2025-26

CLASS : X

Time : 03 Hours | **MATHEMATICS (041)** | **M. M. : 80**

General Instructions:

Read the following instructions carefully and follow them:

1. This question paper contains 38 questions. All Questions are compulsory.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Question numbers 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Question numbers 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Question numbers 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Question numbers 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Question numbers 36-38 are case study-based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. Draw neat and clean figures wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.
09. Use of calculators is not allowed.

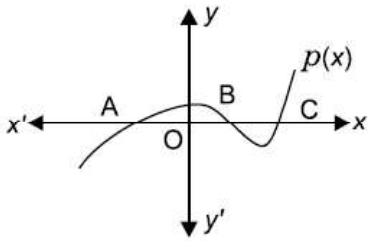
SECTION-A (20×1=20)

This section has 20 Multiple Choice Question (MCQs) carrying (1 Marks Each)

1. Let the ages of Anjali and Beena be a and b such that a = p^3q^4 and b = p^2q^3, where p and q are prime numbers. If HCF(a, b) = p^mq^n and LCM(a, b) = p^rq^s, then(m + n)(r + s) = 1

(a) 15 (b) 30 (c) 35 (d) 72

2. In figure, the graph of a polynomial p(x) is shown. The number of zeroes of p(x) is: 1



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

3. The pair of linear equations $3x + 7y = 2$ and $2x + 5y = \frac{7}{2}$ represents two straight lines. Which of the following is not true about the lines? 1

(a) The pair of lines is consistent.

(b) The pair of lines is inconsistent.

(c) The pair of lines are intersecting.

(d) The pair of lines having unique solution.

4. Which one of the following is not a quadratic equation? 1

(a) $(x + 1)^2 = 4(x^3 - 3)$ (b) $(x - 2)(x + 3) = 2x - 7$

(c) $x^2 + 4x = (2x - 1)^2$ (d) $(x - 2)^3 = x^3 - 3x^2 + 4x + 3$

5. Two A.Ps have the same common difference. The first term of one of these is -1 and that of the other is -8. Then the difference between their 4^{th} terms is: 1

(a) -1 (b) -8 (c) 7 (d) -9

6. Coordinates of three points are (2, 4), (2, 6) and $\left(2-\sqrt{3},5\right)$. The triangle formed by taking these points as vertices is: 1

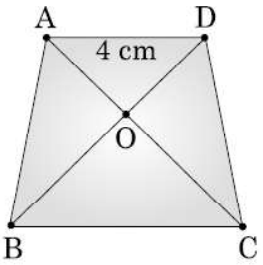
(a) equilateral triangle (b) right-angled triangle

(c) isosceles triangle (d) scalene triangle

7. The coordinates of a point on y-axis which is equidistant from the points (6, 5) and (-4, 3) are: 1

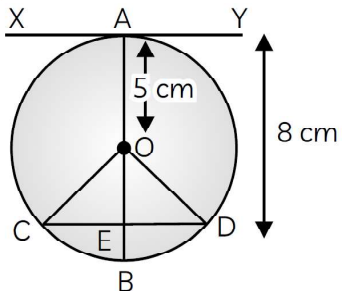
(a) (4, 2) (b) (3, 2) (c) (0, 9) (d) (9, 2)

8. ABCD is a trapezium with AD || BC and AD = 4 cm. If the diagonals AC and BD intersect each other at O such that $\frac{AO}{OC}=\frac{DO}{OB}=\frac{1}{2}$, then BC = 1



(a) 6 cm (b) 7 cm (c) 8 cm (d) 9 cm

9. A tangent, marked XAY, is drawn to a circle with a diameter AB of radius 5 cm. The length of the chord CD parallel to XY and at a distance 8 cm from A, is: 1

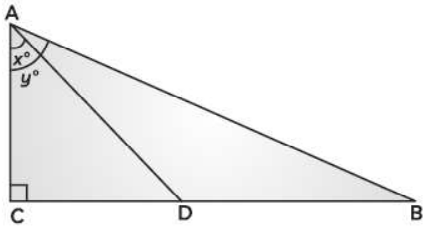


(a) 8 cm (b) 6 cm (c) 5 cm (d) 4 cm

10. The minute hand of a clock is 84 cm long. The distance covered by the tip of minute hand from 10:10 am to 10:25 am is: 1

(a) 44 cm (b) 88 cm (c) 132 cm (d) 176 cm

11. In the given figure, D is the mid-point of BC, then the value of $\frac{\cot y°}{\cot x°}$ is: 1



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

12. If 3 tan A = 4, then the value of $\frac{3 \sin A + 2 \cos A}{3 \sin A - 2 \cos A}$ is: 1

(a) 4 (b) $\frac{11}{15}$ (c) $\frac{7}{15}$ (d) 3

13. If sin q + cos q = $\sqrt{2}$, then tan q + cot q = 1

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

14. Which of the following statements is not true ? 1

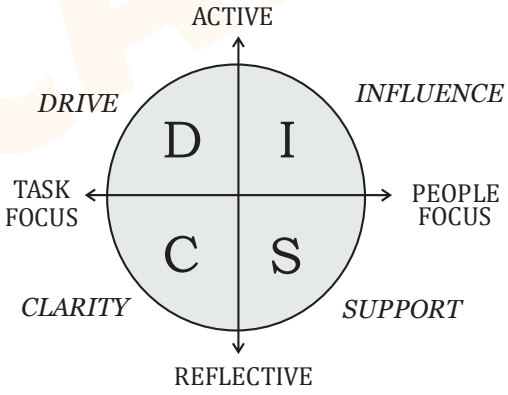
(a) All congruent figures are similar.

(b) All similar figures are congruent.

(c) The ratios of the corresponding sides of similar triangles is constant.

(d) A line drawn parallel to one side of a triangle to intersect the other two sides in distinct points, divides the other two sides in same ratio.

15. Given below is a picture showing special type of dart board. The perimeter of 'I' part quadrant of radius 'r' is: 1



(a) $\frac{r^2}{2}$ units (b) $(\pi + 4)$ units (c) $\frac{r}{2}(\pi + 4)$ units (d) $\frac{r}{2}$ units

16. During the summer rush, Zakhir, a wholesale egg dealer, procures a lot of 400 eggs directly from a poultry farm to supply to nearby grocery stores. From his past records, the probability of receiving a bad egg is 0.035. The number of bad eggs he can expect in this lot is: 1

(a) 7 (b) 14 (c) 21 (d) 58

17. From a pack of 52 playing cards jacks, queens, kings and aces of red colour are removed. From the remaining, a card is drawn at random. The probability that the card drawn is a red card, is: 1

(a) $\frac{1}{4}$ (b) $\frac{1}{7}$ (c) 7 (d) $\frac{9}{22}$

18. For the following distributions, the sum of the lower limits of the median and modal class is: 1

Class	Frequency
0-5	10
5-10	15
10-15	12
15-20	20
20-25	9

(a) 15 (b) 25 (c) 30 (d) 35

DIRECTION: In the question number 19 and 20, a statement of assertion (A) is followed by a statement of reason (R).

Choose the correct option:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

19. Assertion (A): If two identical solid cube of side 7 cm are joined end to end. Then the total surface area of the resulting cuboid is 490 cm^2. 1

Reason (R): Total surface area of cuboid = lb + bh + hl

20. Assertion (A) : $-5, \frac{-5}{2}, 0, \frac{5}{2}$, ... is in Arithmetic Progression. 1

Reason (R) : The terms of an Arithmetic Progression cannot have both positive and negative rational numbers.

SECTION - B $(5 \times 2 = 10)$

This section comprises of 5 questions of 2 marks each.

21. **(A)** The A.P. is 8 ,10,12... has 60 terms. Find the sum of first 10 terms. 2

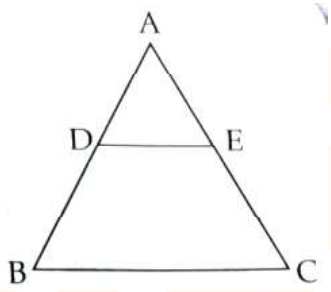
OR

(B) Find the middle term of the A.P. 6,13, 20,...230.

22. Find the value of cos75° using the formula 2

$\cos(A+B) = \cos A \cos B - \sin A \sin B$

23. In the below given figure $\frac{AD}{BD} = \frac{AE}{EC}$ and angle $\angle BDE = \angle CED$, prove that ΔABC is an isosceles triangle. 2

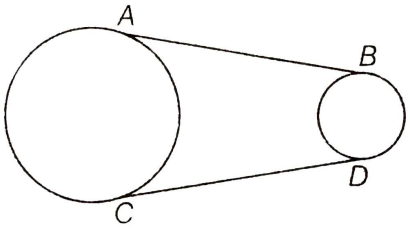


24. (a) The minute hand of a clock is 14cm long. Find the area of the face of the clock described by the minute hand between 10:00AM to 10:30AM. 2

OR

(b) A piece of wire 22cm long is bent into the form of an arc of a circle subtending an angle of 60° at its centre. Find the radius of the circle.

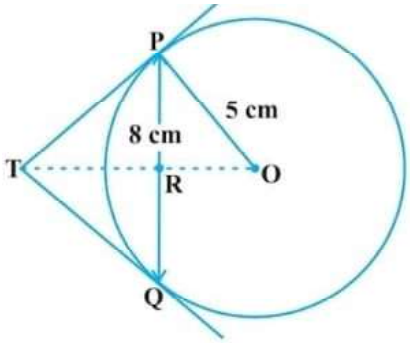
25. In the below givin figure, AB and CD are common tangents to two circles of unequal radii. Prove that $AB = CD$. 2



SECTION-C $(6 \times 3 = 18)$

This section comprises of 6 questions of 3 marks each.

26. PQ is a chord of length 8cm of a circle of radius 5cm. The tangents at P and Q intersect at a point T (see figure). Find the length TP. 3



27. Given that $\sqrt{2}$ is an irrational prove that $5+3\sqrt{2}$ is an irrational number. 3

28. Find the zeroes of the quadratic polynomial $1-5x-14x^2$ and verify the relationship between the zeroes and the coefficient. 3

29. If $\text{cosec}\,\theta+\cot\theta=p$, then prove that $\cos\theta=\dfrac{p^2-1}{p^2+1}$. 3

OR

(b) If $1+\sin^2\theta=3\sin\theta\cos\theta$, then prove that $\tan\theta=1$ or $\dfrac{1}{2}$

30. Two different dice are thrown together. Find the probability that the numbers obtained have: 3

(i) A sum less than 7. (ii) A product less than 16.

(iii) A doublet of odd numbers.

31. Solve the following system of equations graphically $x+2y-7=0,\ 2x-y-4=0$. 3

OR

Two years ago, Salim was thrice as old as his daughter and six years later, he will be four years older than twice his daughter's age. How old are they now?

SECTION-D (4 × 5 = 20)

This section has 4 Long Answer (LA) type questions carrying 5 marks each.

32. To fill a swimming pool two pipes are used. If the pipe of larger diameter used for 4 hours and the pipe of smaller diameter for 9 hours, only half of the pool can be filled. Find, how long it would take for each pipe to fill the pool separately, if the pipe of smaller diameter takes 10 hours more than the pipe of larger diameter to fill the pool? 5

OR

A train covers a distance of 360 km at a uniform speed. If the speed had been 5 km/ hour more, it would have taken 48 minutes less for the journey. Find the original speed of the train.

33. Prove that a line drawn parallel to one side of a triangle to intersect the other two sides at distinct points, divides the other two sides in same ratio. 5

34. There are two identical solid cubical boxes of side 7 cm. From the top face of the first cube a hemisphere of diameter equal to the side of the cube is scooped out. This hemisphere is inverted and placed on the top of the second cube's top surface to form a dome. Find: 5

(A) the ratio of the total surface area of the two new solid formed

(B) volume of each new solid formed.

35. The median of the following data is 16. Find the missing frequencies a and b, if the total of the frequencies is 70. 5

Class	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	12	a	12	15	b	6	6	4

OR

The below table shows the ages of persons who visited a park on a certain day. Find the median age of the persons visiting the park.

Age (Years)	Cumulative Frequency
Less than 10	3
Less than 20	10
Less than 30	22
Less than 40	40
Less than 50	54
Less than 60	71

SECTION-E (3 × 4 = 12)

This section has 3 case study based questions carrying 4 marks each.

Case Study-1

36. The school auditorium was to be constructed to accommodate at least 1500 people. The chairs are to be placed in concentric circular arrangement in such a way that each succeeding circular row has 10 seats more than the previous one.

(A) If the first circular row has 30 seats, how many seats will be there in the 10th row? 1

(B) For 1500 seats in the auditorium, how many rows need to be there? 2

OR

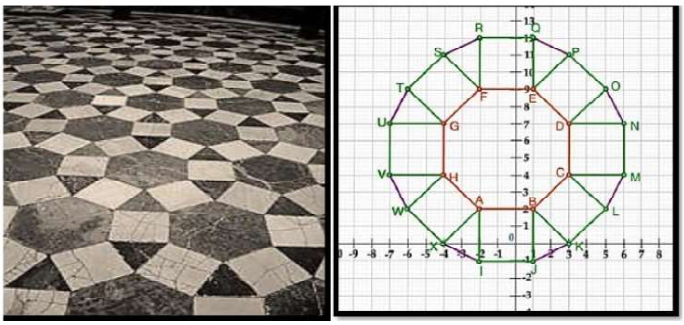
If 1500 seats are to be arranged in the auditorium, how many seats are still left to be put after 10th row?

(C) If there were 17 rows in the auditorium, how many seats will be there in the middle row? 1

Case Study-2

37. Tiling or tessellation of a flat surface is the covering of a plane using one or more geometric shapes, called tiles, with no overlaps and no gaps. Historically, tessellations were used in ancient Rome and in Islamic art. You may find tessellation patterns on floors, walls, paintings etc. A tiled floor in the archaeological Museum of Seville (shown in figure) has been made using squares, triangles and hexagons.

A craftsman thought of making a floor pattern after being inspired by the above design. To ensure accuracy in his work, he made the pattern on the Cartesian plane. He used regular octagons, squares and triangles for his floor tessellation pattern.



(i) What is the length of the line segment joining points B and F? 1

(ii) The centre 'Z' in the figure will be the point of intersection of the diagonals of quadrilateral WXOP. Then what are the coordinates of Z? 1

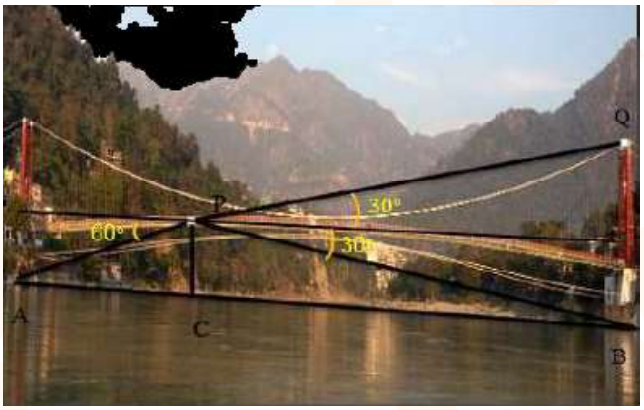
(iii) What are the coordinates of the point on y-axis equidistant from A and G? 2

OR

What is the area of trapezium AFGH?

Case Study-3

38. Lakshaman Jhula is located 5 kilometres north-east of the city of Rishikesh in the Indian state of Uttarakhand. The bridge connects the villages of Tapovan to Jonk. Tapovan is in Tehri Garhwal district, on the west bank of the river, while Jonk is in Pauri Garhwal district, on the east bank. Lakshman Jhula is a pedestrian bridge also used by motorbikes. It is a landmark of Rishikesh. A group of Class X students visited Rishikesh in Uttarakhand on a trip. They observed from a point (P) on a river bridge that the angles of depression of opposite banks of the river are 60° and 30° respectively. The height of the bridge is about 18 metres from the river.



(i) Find the distance PA. 1

(ii) Find the distance PB. 1

(iii) Find the width AB of the river. 2

OR

Find the height BQ if the angle of the elevation from P to Q be 30°.

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