



PRINCE ACADEMY

OF HIGHER EDUCATION

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SAMPLE PAPER - II : 2025-26

CLASS : X

MATHEMATICS (041)

Time : 03 Hours

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 mark each.

1. If one root of the quadratic equation $2x^2 + 3x + k = 0$ is -3, then what will be the value of k. 1
(a) $\frac{3}{2}$ (b) 9 (c) $-\frac{3}{2}$ (d) -9
2. 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 possess unique solution
3. If $\left(\frac{a}{3}, 4\right)$ is the mid-point of the segment joining the points P(- 6,5) and R(- 2, 3) then the value of 'a' is: 1
(a) 12 (b) -6 (c) -12 (d) -4

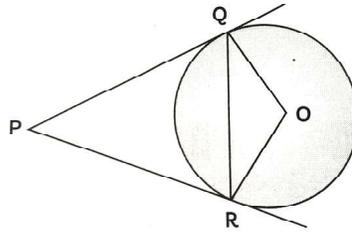
4. If $x \tan 60^\circ \cos 60^\circ = \sin 60^\circ \cot 60^\circ$ then $x =$ 1
 (a) $\cos 30^\circ$ (b) $\tan 30^\circ$ (c) $\sin 30^\circ$ (d) $\cot 30^\circ$
5. Product of two numbers is 4936 and their HCF is 8, then their LCM is: 1
 (a) 517 (b) 617 (c) 317 (d) 417
6. A pendulum swings through an angle of 30° and describes an arc of length 8.8cm, then the length of the pendulum is: 1
 (a) 16.8cm (b) 17.2cm (c) 13.6cm (d) 11.9cm
7. If the height of right circular cylinder is 7cm and volume is $448\pi \text{ cm}^3$ then the radius is: 1
 (a) 8cm (b) 10cm (c) 11cm (d) 15cm
8. Consider the frequency distribution of 46 observations 1

Class	10-14	14-18	18-22	22-26	26-30
Frequency	7	10	8	12	9

The sum of the upper limits of the median and modal class is:

- (a) 46 (b) 48 (c) 50 (d) 45
9. A quadrilateral PQRS is drawn to circumscribe a circle. If $PQ=12\text{cm}$, $QR=15\text{cm}$ and $RS=14\text{cm}$ then find the length of SP. 1
 (a) 15cm (b) 14cm (c) 12cm (d) 11cm
10. Which one of the following is not a quadratic equation? 1
 (a) $x^3 + x^2 - 2x = (x - 1)^3$ (b) $(x + 2)^3 = (x - 3)^3$
 (c) $(x + 4)(x - 3) = x(x - 3) + 5$ (d) $(5x + 7)(2x + 3) = (3x + 2)x + 7$
11. Card numbered 7 to 40 were put in a box. Anish selects a card at random. The probability that the selected card has a number multiple of 7 is: 1
 (a) $\frac{7}{34}$ (b) $\frac{5}{34}$ (c) $\frac{7}{35}$ (d) $\frac{6}{35}$
12. If $\tan \theta - \sec \theta = p$, then the value of $\tan \theta + \sec \theta$ is 1
 (a) $\frac{1}{p}$ (b) p (c) $-p$ (d) $-\frac{1}{p}$
13. If $2P$ is an angle of a sector of a circle of radius R , then area of the sector is: 1
 (a) $\frac{(\pi R^2 p)}{720^\circ}$ (b) $\frac{2\pi R p}{360^\circ}$ (c) $\frac{\pi R^2 p}{360^\circ}$ (d) $\frac{\pi R^2 p}{180^\circ}$
14. For an event E , $P(E) + P(\bar{E}) = x$, then the value of $x^3 - 3$ is: 1
 (a) -2 (b) 2 (c) 1 (d) -1
15. If $\Delta ABC \sim \Delta EDF$ and ΔABC is not similar to ΔDEF then, which of the following option is not true 1
 (a) $BC \times EF = AC \times DF$ (b) $AB \times EF = AC \times DE$
 (c) $BC \times DE = AB \times EF$ (d) $BC \times DE = AB \times FD$
16. The median of a set of 9 distinct observations is 20.5. If each of the observations of a set is increased by 2, then the median of a new set: 1
 (a) is increased by 2
 (b) is decreased by 2
 (c) is two times the original number
 (d) Remains same as that of original observations

17. From a point P two tangents are drawn to a circle at point Q and R. Which of the following statements is correct? 1



- (a) The length of tangents PQ and PR are different.
 (b) $\angle QPR = 70^\circ$ then $\angle QOR = 100^\circ$
 (c) $\triangle QOR$ is an equilateral triangle.
 (d) PQOR is a cyclic quadrilateral.
18. The distance between the points $(m, -n)$ and $(-m, n)$ is: 1
- (a) $\sqrt{(m^2 + n^2)}$ (b) $m + n$ (c) $2\sqrt{(m^2 + n^2)}$ (d) $\sqrt{(2m^2 + n^2)}$

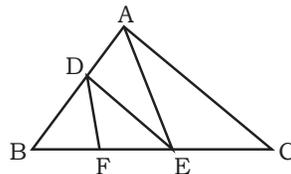
Direction : In the question number 19 and 20, a statement of **Assertion (A)** is followed by a statement of **Reason (R)**. Choose the correct option.

- (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 $\tan \theta + \cot \theta = p$ then $\tan^2 \theta + \cot^2 \theta = p^2 - 2$ 1
Reason (R) : $\tan \theta \cdot \cot \theta = 2$
20. **Assertion (A) :** If 4^n ends with zero for some n, then it must have 5 as a factor. 1
Reason (R) : The prime factorisation of 4^n contains only 2.

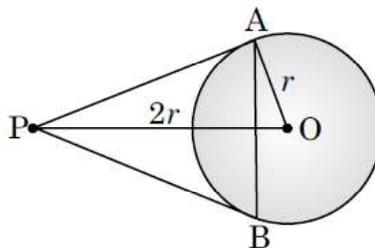
SECTION-B

This section has 5 Very Short Answer (VSA) type questions carrying 2 marks each.

21. Write the smallest number which is divisible by both 306 and 657. 2
22. In the figure, $DE \parallel AC$ and $DF \parallel AE$. Prove that $\frac{BF}{FE} = \frac{BE}{EC}$ 2



23. From a point P, two tangents PA and PB are drawn to a circle C(O, r). If $OP = 2r$, then find $\angle APB$. What type of triangle is APB? 2



24. If $\sin(A + B) = 1$ and $\cos(A - B) = \frac{\sqrt{3}}{2}$, $0^\circ < A + B \leq 90^\circ$ and $A > B$, then find values of A and B. 2

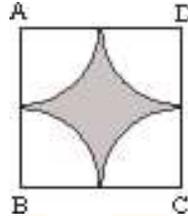
OR

If $K + 1 = \sec^2 q(1 + \sin q)(1 - \sin q)$, find the value of K.

25. The length of the minute hand of a clock is 6 cm. Find the area swept by it when it moves from 7 : 05 pm to 7 : 20 pm. 2

OR

In the given figure, arcs have been drawn of radius 7 cm each with vertices A, B, C and D of quadrilateral ABCD as centres. Find the area of the shaded region.



SECTION-C (6 × 3 = 18)

This section has 6 Short Answers (SA) type questions carrying 3 marks each.

26. During a sale, colour pencils were being sold in the pack of 24 each and crayons in the pack of 32 each. If you want full packs of both and the same number of pencils and crayons, how many packets of each would you need to buy? 3
27. Find a quadratic polynomial whose zeroes are reciprocals of the zeroes of the polynomial $f(x) = ax^2 + bx + c$, $a \neq 0$, $c \neq 0$. 3
28. Solve for x : $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$, $x \neq -4, 7$. 3

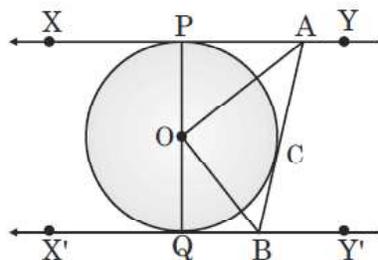
OR

Solve the following system of equations graphically: $2x + 3y = 6$, $x - 3y = -6$. Find the area of the triangle so formed by two lines and x-axis.

29. Prove that a parallelogram circumscribing a circle is a rhombus. 3

OR

In figure, XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersects XY at A and X'Y' at B, then prove that $\angle AOB = 90^\circ$.



30. Prove the following: 3

$$\frac{\tan^3 \theta}{1 + \tan^2 \theta} + \frac{\cot^3 \theta}{1 + \cot^2 \theta} = \sec \theta \cos \theta - 2 \sin \theta \cos \theta$$

31. A game of chance consists of spinning an arrow which is equally likely to point (after coming to rest) a, b, c, d, e, f, g, h, i, o (a special type of spinning board) as shown in figure. 3

The conditions are:

- (I) On spinning the arrow, if it stops at vowels, person would get a kitkat.
 (II) On spinning the arrow, if it stops at consonants, person would get 5 star. Sanaya wants to play the game and win kitkat. Check whether she has the higher probability of doing so. Justify your answer.

SECTION - D

This action comprises of 4 questions of 5 marks each

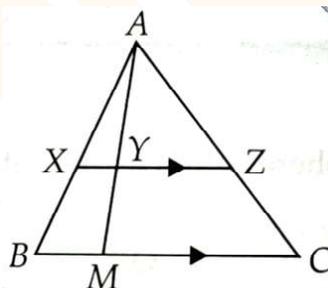
32. (A) In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/h from its usual speed and time of flight increased by 30 minutes. Find the scheduled duration of the flight. 5

OR

- (B) A two-digit number is such that the product of its digits is 14. If 45 is added to the number, the digits interchange their places. Find the number.

33. (A) State and prove basic proportionality theorem. 5

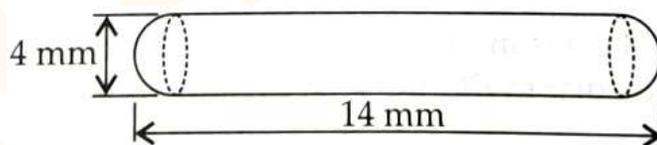
- (B) In the given figure. $XZ \parallel BC$. If $AZ = 3\text{cm}$, $ZC = 2\text{cm}$, $BM = 3\text{cm}$ and $MC = 5\text{cm}$ Find the length of XY .



34. (A) A student was asked to make a model shaped like a cylinder with two cones attached to its ends by using a thin aluminium sheet. The diameter of the model is 3cm and its total length is 12cm. If each cone has a height of 2cm, find the volume of air contained in the model. 5

OR

- (B) A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends. The length of the entire capsule is 14mm and the diameter of the capsule is 4mm, find its surface area. Also, find its volume



35. (A) If the mean of the following frequency distribution is 91, find the missing frequencies x and y . 5

Classes	0-30	30-60	60-90	90-120	120-150	150-180	Total
Frequency	12	21	x	52	y	11	150

OR

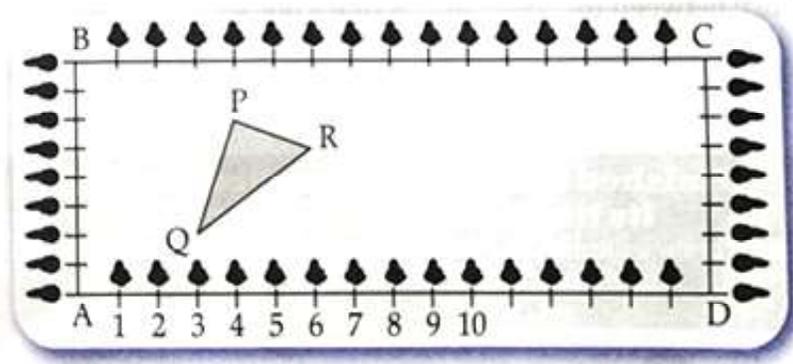
- (B) The following table gives the marks obtained by 80 students in a test. Find the median.

Marks:	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60
No. of Students:	3	12	27	57	75	80

SECTION - E ($3 \times 4 = 12$)

This section comprises 3 questions of 4 marks each.

- 36.** The Class X students of a school in Rohini have been allotted a rectangular plot of a land for gardening activities. Saplings of Gulmohar are planted along the boundary at a distance of 1m apart. There is a triangular grassy lawn in the plot as shown in the following figure. The students are to sow seeds of the flowering plants in the remaining area of the plot. 4



Based on the above information, answer the following questions

- (i) Taking A as the origin and AD and AB as the coordinate axes, find the co-ordinates of P
(ii) Taking A as the origin and AD and AB as the coordinate axes, find the co-ordinates of Q
(iii) (a) Taking A as the origin, find the distance of PR

OR

- (b) Taking C as the origin, find the distance of PR.

- 37.** Treasure Hunt is an exciting and adventurous game where participants follow a series of clues/numbers/maps to discover hidden treasures. Players engage in a thrilling quest, solving puzzles and riddles to unveil the location of the coveted prize. 4
While playing a treasure hunt game, some clues (numbers) are hidden in various spots collectively forming an A.P. If the number on the n^{th} spot is $20+4n$, then answer the following questions to help the players in spotting the clues:

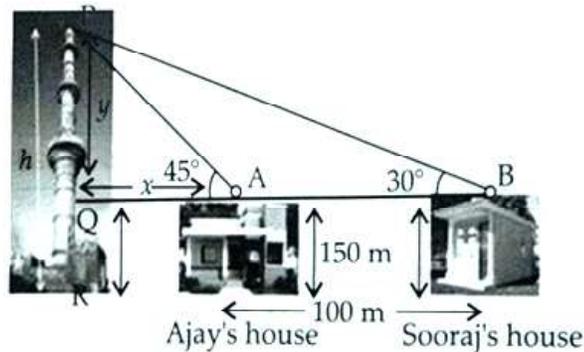


- (i) Which number is on first spot?
(ii) (a) Which spot is numbered as 112?

OR

- (b) What is the sum of all the numbers on the first 10 spots?
(iii) Which number is on the $(n-2)^{\text{th}}$ spot?

38. The houses of Ajay and Sooraj are at 100m distance and height of their houses is the same which is approximate equals to 150m. One big tower was situated near their house. Once both friends decided to measure the height of the tower. They measure the angle of the top of the tower from the roof of their houses. The angle of elevation of Ajay's house to the tower and Sooraj's house to the tower are 45° and 30° respectively as shown in the figure. 4



Based on the above information, answer the following.

- What is the distance between Ajay's house and the tower?
- What is the distance between Ajay's house and Sooraj's house?
- (a) Find the height of the tower?

OR

- What is the distance between the tower and Sooraj's house?

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