

**MATHEMATICS STANDARD – Code No.041**  
**PRACTICE QUESTION PAPER - I CLASS – X (2025-26)**  
**As per Pattern of CBSE Official Sample Paper 2025-2026**  
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**Maximum Marks: 80**

**Time: 3 hours**

**General Instructions:**

Read the following instructions carefully and follow them:

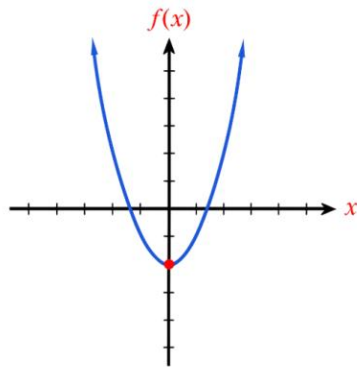
1. This question paper contains 38 questions. All Questions are compulsory.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Question numbers 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.
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. There is no overall choice. However, an internal choice in 2 questions of Section B, 2 questions of Section C and 2 questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required. Take  $\pi = \frac{22}{7}$  wherever required if not stated.
10. Use of calculators is not allowed.

**Section A: Consists of 20 questions of 1 mark each**

1. Given that  $\text{HCF}(48, a) = 3$  and  $\text{LCM}(48, a) = 144$ . Then  $a$  is \_\_\_\_  
(A) 6 (B) 8 (C) 9 (D) 12
2. Find the value of  $k$  given that the equation  $12x^2 + kx + 27 = 0$  had equal roots  
(A) 30 (B) -36 (C) 39 (D) None of These
3. The mode of 7 observations is 17. Find  $x$  if the observations are: 8, 2, 17,  $x$ , 17, 11, 2.  
(A) 2 (B) 8 (C) 10 (D) 17
4. If  $\operatorname{cosec} \theta - \cot \theta = m$ , then  $\operatorname{cosec} \theta + \cot \theta$  will be  
(A)  $m$  (B)  $\frac{1}{m}$  (C)  $m^2$  (D)  $2m$

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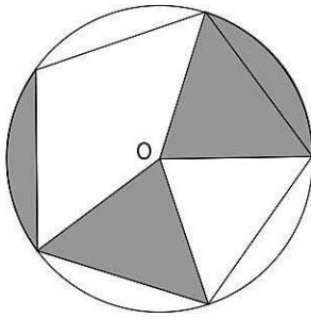
5. The length of a tangent drawn to a circle of radius 9 cm from a point at a distance of 41cm from the centre of the circle is  
 (A) 40cm (B) 9cm (C) 41cm (D) 50cm
6. The probability of selecting a consonant from the letters of the word 'HYDERABAD' is  
 (A)  $\frac{3}{9}$  (B)  $\frac{6}{9}$  (C)  $\frac{4}{8}$  (D)  $\frac{6}{8}$
7. If two ends of the diameter of a circle are A(8, -4) and the origin. Then the centre of the circle is  
 (A) (0, 0) (B) (16, -2) (C) (4, -2) (D) (-4, 2)
8. A right  $\triangle ABC$  right angled at A is drawn to circumscribe a circle of radius 5 cm with centre O. If AC = 17 cm and AB = 18 cm, then OC is equal to  
 (A) 10 cm (B) 9 cm (C) 12 cm (D) 13 cm
9. What type of polynomial  $f(x)$ , is represented in the graph shown below



- (A) Linear (B) Quadratic (C) Cubic (D) Constant
10. The sum of 3 terms of an AP is 51. Then what is its middle term?  
 (A) 17 (B) 16 (C) 19 (D) 18
11. The angle of elevation of the top of a 55 m high tower at a point 55 m away from the base of the tower is \_\_\_\_\_.  
 (A)  $30^\circ$  (B)  $40^\circ$  (C)  $45^\circ$  (D)  $60^\circ$
12. Two cones have their heights in the ratio 1:3 and radii 3:1. What is the ratio of their volumes?  
 (A) 1:1 (B) 1:3 (C) 3:1 (D) 3:3
13. An urn contains 5 red, 6 blue and 8 yellow balls. If a ball is selected at random what is the probability that it is red?  
 (A)  $\frac{5}{8}$  (B)  $\frac{6}{8}$  (C)  $\frac{6}{19}$  (D)  $\frac{5}{19}$

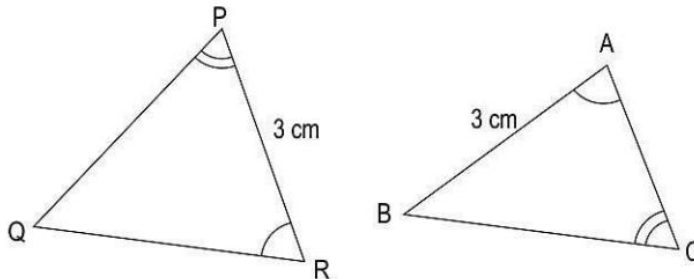
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14. A regular pentagon is inscribed in a circle with centre O, of radius 5 cm, as shown below.



What is the area of the shaded part of the circle?

- (A)  $2\pi \text{ cm}^2$  (B)  $4\pi \text{ cm}^2$  (C)  $5\pi \text{ cm}^2$  (D)  $10\pi \text{ cm}^2$
15. If  $x = a \cos \theta$  and  $y = b \sin \theta$ , then  $b^2 x^2 + a^2 y^2 =$   
 (A)  $a^2 b^2$  (B)  $ab$  (C)  $a^4 b^4$  (D)  $a^2 + b^2$
16. The probability of selecting a bad apple in a box of 400 apples is 0.035. The total number of bad apples is  
 (A) 7 (B) 14 (C) 21 (D) 28
17. Two scalene triangles are given below.



(Note: The figures are not to scale.)

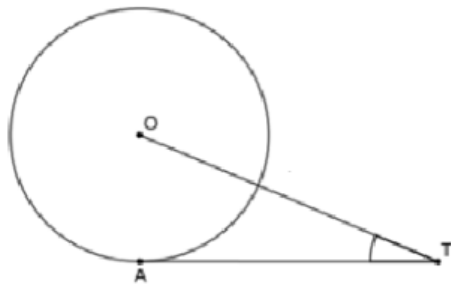
Anas and Rishi observed them and said the following:

Anas:  $\triangle PQR$  is similar to  $\triangle CBA$ .

Rishi:  $\triangle PQR$  is congruent to  $\triangle CBA$ .

Which of them is/are correct?

- (A) Only Anas (B) Only Rishi (C) Both Anas and Rishi  
 (D) Neither of them, as two scalene triangles can never be similar or congruent.
18. In given figure, AT is a tangent to the circle with centre O such that  $OT = 6 \text{ cm}$  and  $\angle OTA = 45^\circ$ . Then AT is equal to \_\_\_\_



(A)  $3\sqrt{2}$

(B) 3

(C)  $3\sqrt{3}$

(D) 4

Instructions for questions 19 and 20

Two statements are given below - one labelled Assertion (A) and the other labelled Reason (R). Read the statements carefully and choose the option that correctly describes statements (A) and (R).

19. Assertion (A): The origin is the ONLY point equidistant from (2, 3) and (-2, -3).

Reason (R): The origin is the midpoint of the line joining (2, 3) and (-2, -3).

(A) Both (A) and (R) are true and (R) is the correct explanation for (A).

(B) Both (A) and (R) are true but (R) is not the correct explanation for (A).

(C) (A) is true but (R) is false.

(D) (A) is false but (R) is true.

20. Assertion (A): The two tangents are drawn to a circle from an external point, then they subtend equal angles at the centre.

Reason (R): A parallelogram circumscribing a circle is a rhombus.

(A) Both (A) and (R) are true and (R) is the correct explanation for (A).

(B) Both (A) and (R) are true but (R) is not the correct explanation for (A).

(C) (A) is true but (R) is false.

(D) (A) is false but (R) is true.

### **Section B: Consists of 5 questions of 2 marks each**

21. Aman and David visited the same store on the 1st of January. If Aman visits the store every 4th day and David visits the store every 7th day, on which date will they visit the store together again?

22. Evaluate:  $3 \sin 30^\circ - 1 + 2 \cos^2 45^\circ - 4 \sin^2 30^\circ$

23. (A): If  $12x + 8y = 56$  and  $8x + 12y = 44$ , then find the value of  $x$  and  $y$ .

OR

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(B): Find what value of  $k$  for which the following pair of linear equations have infinitely many solutions:  $2x + 3y = 7$ ,  $(k - 1)x + (k + 2)y = 3k$

24. (A): Two parallel lines touch the circle at points A and B respectively. If area of the circle is  $25\pi \text{ cm}^2$ , then find the length of AB.

OR

(B): Measure of the legs of a right angled triangle is 16cm and 8cm. Find the length of the side of the largest square than can be inscribed in it.

25. Two dice are rolled simultaneously. The numbers on their top faces are added, what is the probability of getting a sum less than 5?

**Section C: Consists of 6 questions of 3 marks each**

26. Find the zeroes of the polynomial  $x^2 - 5$  and verify the relationship between zeroes and coefficients of the polynomial

27. Prove that  $\sqrt{7}$  is irrational.

28. Prove that:  $\frac{\sin^2 \theta}{\cos^2 \theta} + \frac{\cos^2 \theta}{\sin^2 \theta} = \frac{1}{\sin^2 \theta \cos^2 \theta} - 2$

OR

$$\frac{\cos^2 A}{1 - \tan A} + \frac{\sin^2 A}{1 - \cot A} = 1 + \sin A \cos A$$

29. (A): The area of a rectangle reduces by  $160 \text{ m}^2$  if its length is increased by  $5 \text{ m}$  and breadth is reduced by  $4 \text{ m}$ . However, if the length is decreased by  $10 \text{ m}$  and breadth is increased by  $2 \text{ m}$ , then its area is decreased by  $100 \text{ m}^2$ . Find the dimensions of the rectangle.

OR

(B): If 16 is subtracted from twice the greater of two positive numbers, the result is half the other number. If 1 is subtracted from half the greater number, the result is still half the other number. Find the two numbers.

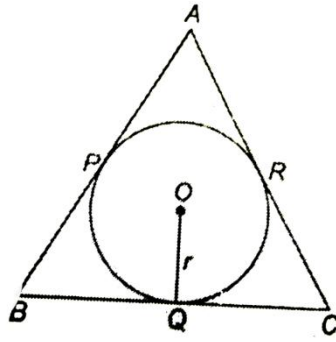
30. A circus tent is in the shape of a cylinder surmounted by a conical top of same diameter. If their common diameter is 56 m, the height of cylindrical part is 6 m and the total height of the tent above the ground is 27 m, find the area of the canvas used in making the tent.
31. In the given figure the sides AB, BC and CA of triangle ABC touch a circle with centre O and radius  $r$  at P, Q and R respectively.

Prove that:

(i)  $AB + CQ = AC + BQ$

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$$(ii) \text{Area}(\Delta ABC) = \frac{1}{2} (\text{Perimeter of } \Delta ABC) \times r$$



**Section D: Consists of 4 questions of 5 marks each**

32. Rohan can row the boat at a speed of 5 km/hr in still water. If it takes him 1 hour more to row the boat 5.25 km upstream than to return downstream, find the speed of the stream.
33. (A): The following table gives weights of standard 10 students in a school. The frequency of class 49-52 is missing. It is known that the mean of the frequency distribution is 47.2. Find the missing frequency.

| Weight (Kg)        | 40-43 | 43-46 | 46-49 | 49-52 | 52-55 |
|--------------------|-------|-------|-------|-------|-------|
| Number of Students | 31    | 58    | 60    | ?     | 27    |

OR

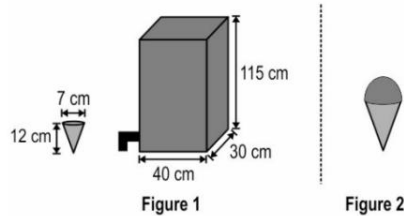
(B): A life insurance agent found the following data for distribution of ages of 100 policy holders. Calculate the median age, if policies are given only to persons having age 18 years onwards but less than 60 years.

| Age (years)          | Below 20 | 20-25 | 25-30 | 30-35 | 35-40 | 40-45 | 45-50 | 50-55 | 55-60 |
|----------------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|
| No of policy Holders | 2        | 4     | 18    | 21    | 33    | 11    | 3     | 6     | 2     |

34. Prove that if a line is drawn parallel to one side of a triangle intersecting the other two sides in distinct points, then the other two sides are divided in the same ratio.  
Using the above theorem prove that a line through the point of intersection of the diagonals and parallel to the base of the trapezium divides the non parallel sides in the same ratio.
35. (A): A restaurant stores ice-cream in a box with a dispenser attached for filling ice-cream

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cones. The dimensions of the box and the ice-cream cones used by the restaurant are shown in Figure 1 below. To make each serving of dessert, the cone is first filled with ice-cream and then topped with a hemispherical scoop of ice-cream taken from the same box, as shown in Figure 2.

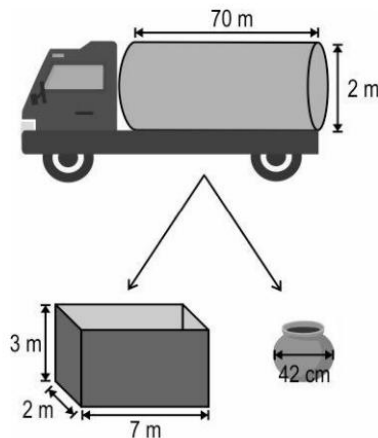


(Note: The figures are not to scale.)

Approximately how many desserts can be served out of a completely filled box of ice-cream? Show your steps. (Take  $\pi$  as  $\frac{22}{7}$ )

OR

(B): A right-circular cylindrical water tanker supplies water to colonies on the outskirts of a city and to nearby villages. Each colony has a cuboidal water tank. In villages, people come with matkas (spherical clay pots) to fill water for their household.



(Note: The figures are not to scale.)

- i) How many colonies in total would one full tanker be able to supply?
- ii) If a tanker supplies water to 3 colonies and then goes to a village where 400 people fill their matkas, roughly how much water is supplied by the tanker in all?

Give your answer in  $\text{m}^3$ .

Show your work.

(Note: Assume all the tanks/matkas are completely filled without any loss of water, Take

$\pi$  as  $\frac{22}{7}$ . Use  $1000000 \text{ cm}^3 = 1 \text{ m}^3$ .)

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**Section E: Consists of 3 Case based study questions of 4 (1+1+2) marks each**

36. Answer the following questions based on the information given below.

Ms. Sheela visited a store near her house and found that the glass jars are arranged one above the other in a specific pattern. On the top layer there are 3 jars.

In the next layer there are 6 jars. In the 3rd layer from the top there are 9 jars and so on till the 8th layer.

(i) Write an A.P whose terms represent the number of jars in different layers starting from top . Also, find the common difference.

(ii) Is it possible to arrange 34 jars in a layer if this pattern is continued? Justify your answer.

(iii) (A) If there are 'n' number of layers then find the expression for finding the total number of jars in terms of n. Hence find  $S_8$  .

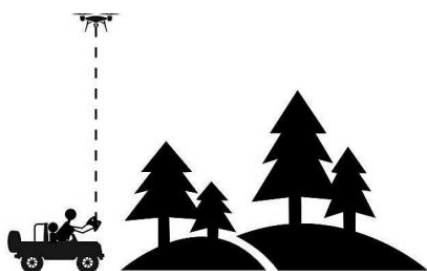
OR

(iii) (B) The shopkeeper added 3 jars in each layer. How many jars are there in the 5th layer from the top?

37. Answer the following questions based on the information given below.

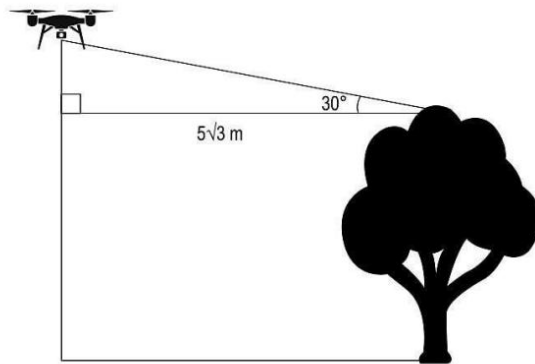
A drone, is an aircraft without any human pilot and is controlled by a remotecontrol device. Its various applications include policing, surveillance, photography, precision agriculture, forest fire monitoring, river monitoring and so on.

David used an advanced drone with high resolution camera during an expedition in a forest region which could fly upto 100 m height above the ground level. David rode on an open jeep to go deeper into the forest. The initial position of drone with respect to the open jeep on which David was riding is shown below



David's jeep started moving to enter the forest at an average speed of 10 m/s. He Simultaneously started flying the drone in the same direction as that of the jeep. (take  $\sqrt{3}$  as 1.73)

(i) David reached near one of the tallest trees in the forest. He stopped the drone at a horizontal distance of  $5\sqrt{3}$  m from the top of the tree and at a vertical distance of 65 m below its maximum vertical range. If the angle of elevation of the drone from the top of the tree was  $30^\circ$ , find the height of the tree. Show your work.

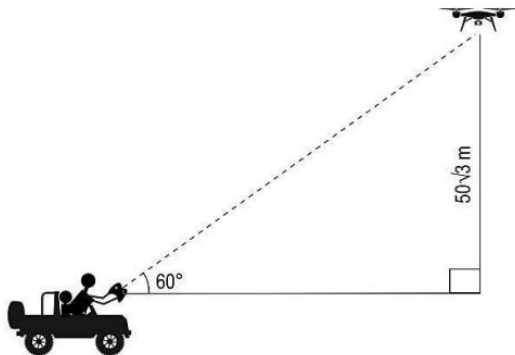


(Note: The figure is not to scale.)

(ii) The drone was flying at a height of  $30\sqrt{3}$  metres at a constant speed in the horizontal direction when it spotted a zebra near a pond, right below the drone.

The drone travelled for 30 metres from there and it could see the zebra, at the same place, at an angle of depression of  $\theta$  from it. Draw a diagram to represent this situation and find  $\theta$ . Show your work.

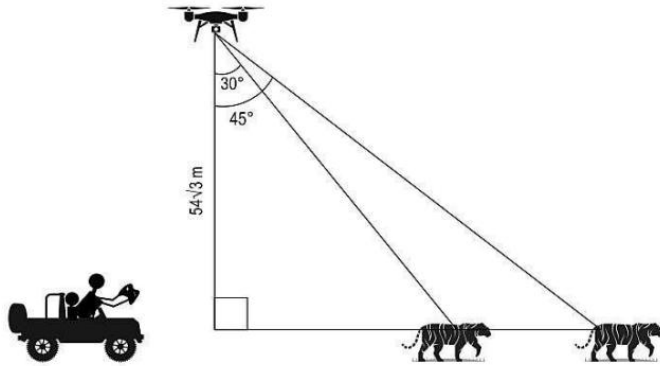
(iii) (A) After 2 minutes of starting the expedition both the drone and the jeep stopped at the same moment so that the drone can capture some images. The position of the drone and the jeep when they stopped is as shown below. Find the average speed of the drone in m/s rounded off upto 2 decimal places. Show your work.



(Note: The figure is not to scale.)

OR

(B) At some point during the expedition, David kept the drone stationary for some time to capture the images of a tiger. The angle of depression from the drone to the tiger changed from  $30^\circ$  to  $45^\circ$  in 3 seconds as shown below. What was the average speed of the tiger during that time? Show your work.



(Note: The figure is not to scale.)

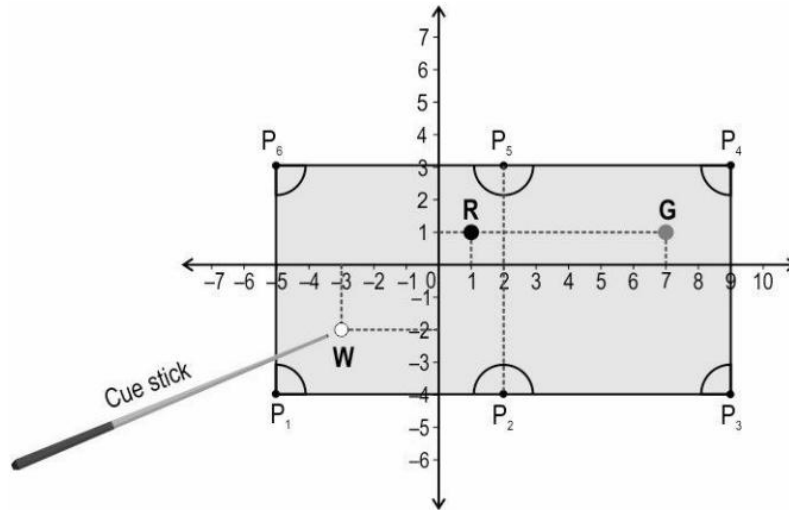
38. Answer the following questions based on the information given below.

Raycasting is a technique used in the creation of computer games. The basic idea of raycasting is as follows: the map is a 2D square grid. Using rays generated from an object, this 2D map can be transformed into a 3D perspective. One of the methods involves sending out a ray from the player's location. To determine how far he/she is from a wall or an obstacle, the distance between the player's coordinates and the coordinate of the wall is calculated. If the player is near the obstacle, it looks larger and vice-versa.

Shown below is a game, Wolf 3D, which was created using raycasting.



Riju wants to create an online snooker game using raycasting. The game in the creation stage on a coordinate map is shown below.



The snooker table has six pockets (P1, P2, P3, P4, P5 and P6) and he has shown three balls - white (W), red (R) and green (G) on the table. The objective of the game is to use the white ball to hit the coloured balls into the pockets using a cue stick.

(i) How much distance will a ray travel if sent from the green ball to the nearest pocket? Show your work.

(ii) Riju wants to place a yellow ball at the midpoint of the line connecting the white and green balls. Find the coordinates of the point at which he should place the yellow ball. Show your steps.

(iii) (A) Riju is running a trial on his game. He struck the white ball in a way that it rebound off the rail (line connecting P4 and P6) and went into the pocket P2.

♦ After the rebound, the ball crossed the x-axis at point X ( $\frac{2}{7}$ , 0) on the way to the pocket.

♦ The ratio of the distance between the rail and point X and the distance between point X and the pocket was 3:4.

Find the coordinates of the point at which the ball struck the rail. Show your steps.

OR

(iii) (B) Riju wants to hit a blue ball placed at (-1, -3) into pocket P5 along a straight path. Would the red ball lie on the straight path between the blue ball and P5? Justify your answer.

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