BHARTIYA SHIKSHA BOARD
SAMPLE QUESTION PAPER
2025-26
CLASS - X
MATHEMATICS (036)

General Instructions:
सामान्य निर्देश:

Read the following instructions very carefully and strictly follow them.
निम्नलिखित निर्देशों को ध्यान से पढ़ें एवं पूर्णरूप से उनका अनुपालन करें।

Time allowed : 3 hours | Maximum marks : 80
निर्धारित समय : 3 घंटे | अधिकतम अंक : 80

Note / नोट :

(i) Please check that this question paper contains ____ printed pages.
कृपया जाँच कर लें कि इस प्रश्न-पत्र में __ मुद्रित पृष्ठ हैं।

(ii) Code number given on the right hand side of the question paper should be written on the title-page of the answer-book by the candidate.
प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए कोड नंबर को छात्र उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें।

(iii) Please check that this question paper contains **38** questions.
कृपया जाँच कर लें कि इस प्रश्न-पत्र में **38** प्रश्न हैं।

(iv) **Please write down the Serial Number of the question in the answer-book before attempting it.**
कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर-पुस्तिका में प्रश्न का क्रमांक अवश्य लिखें।

(v) **15** Minutes time has been allotted to read this question paper. The question paper will be distributed at **10.15** a.m., From **10.15** a.m. to **10.30** a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.
इस प्रश्न-पत्र को पढ़ने के लिए **15** मिनट का समय दिया गया है। प्रश्न-पत्र का वितरण पूर्वाह्न में **10.15** बजे किया जाएगा। पूर्वाह्न में **10.15** से **10.30** बजे तक छात्र प्रश्न-पत्र को केवल पढ़ेंगे और इस अवधि के दौरान वे उत्तर-पुस्तिका में कोई उत्तर नहीं लिखेंगे।

(vi) This question paper comprises **five sections** – **A, B, C, D** and **E**. All questions are compulsory.

प्रश्न-पत्र को **पाँच खंडों** में विभाजित किया गया है – **क, ख, ग, घ** एवं **ङ**। सभी प्रश्न अनिवार्य हैं।

(vii) **Section A** – Q. No. **1** to **20** comprises questions of **1** mark each.

खंड – क में प्रश्न संख्या **1** से **20** तक प्रश्न हैं एवं प्रत्येक प्रश्न **1** अंक का है।

(viii) **Section B** – Q. No. **21** to **25** comprises questions of **2** marks each.

खंड – ख में प्रश्न संख्या **21** से **25** तक प्रश्न हैं एवं प्रत्येक प्रश्न **2** अंकों का है।

(ix) **Section C** – Q No. **26** to **31** comprises questions of **3** marks each.

खंड – ग में प्रश्न संख्या **26** से **31** तक प्रश्न हैं एवं प्रत्येक प्रश्न **3** अंकों का है।

(x) **Section D** – Q No. **32** to **35** comprises questions of **5** marks each.

खंड – घ में प्रश्न संख्या **32** से **35** तक प्रश्न हैं एवं प्रत्येक प्रश्न **5** अंकों का है।

(xi) **Section E** – Q No. **36** to **38** comprises questions of **4** marks each.

खंड – ङ में प्रश्न संख्या **36** से **38** तक प्रश्न हैं एवं प्रत्येक प्रश्न **4** अंकों का है।

(xii) There is no overall choice in the question paper. However, an internal choice has been provided in **2** questions of **2** marks each, **2** questions of **3** marks each, **2** questions of **5** marks each and each question of **4** marks has an internal choice in one part. You have to **attempt only of the choices** in such questions.

प्रश्न-पत्र में समग्र पर कोई विकल्प नहीं है। यथापि, **2** अंकों वाले प्रश्नों में, **3** अंकों वाले प्रश्नों में, **5** अंकों वाले प्रश्नों में, दो प्रश्नों में आंतरिक विकल्प दिए गए हैं एवं **4** अंकों वाले, प्रत्येक प्रश्न के एक भाग में आंतरिक विकल्प है। ऐसे प्रश्नों में **केवल एक ही विकल्प का उत्तर लिखिए**।

(xiii) In addition to this, separate instructions are given with each section and question, wherever necessary.

इसके अतिरिक्त, आवश्यकतानुसार, प्रत्येक अनुभाग और प्रश्न के साथ यथोचित निर्देश दिए गए हैं।

(xiv) Use of Calculator is not permitted.

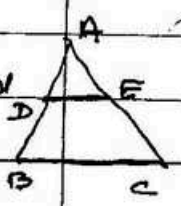
कैलकुलेटर के प्रयोग की अनुमति नहीं है।

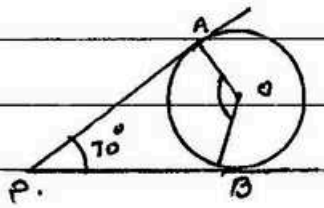
(xv) Draw neat figures wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.

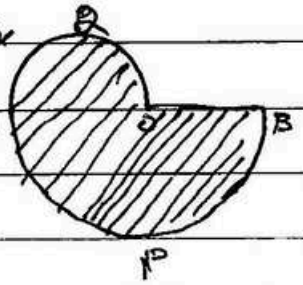
जहाँ भी चित्र आवश्यक हो, स्पष्ट चित्र बनाएँ। जहाँ भी आवश्यकता हो, $\pi = \frac{22}{7}$ ही लें।

Q.No.	Question	Marks
	SECTION – A	
	Section – A consists of 20 questions of 1 mark each.	
1.	Which term of the A.P. 8, 14, 20, 26, ... is 72 more than its 41st term? (a) 47th (b) 49th (c) 53th (d) 57th	
2	The sum of all 3-digit natural numbers, which are divisible by 7, is (a) 6735 (b) 7336 (c) 20479 (d) 70336	
3	$7 \times 11 \times 13 \times 15 + 15$ is a/an (a) prime number (b) composite number (c) neither prime nor composite number (d) irrational number	
4.	The zeros of the polynomial $2y^2 - y - 6$ are (a) 2, 3 (b) $-2, 3/2$ (c) $2, \frac{2}{3}$ (d) $2, -3/2$	
5	The point, which lies on the line given by $3x - 4y = 1$, is (a) (3, 4) (b) (−1, −1) (c) (1, −1) (d) (−1, 1)	

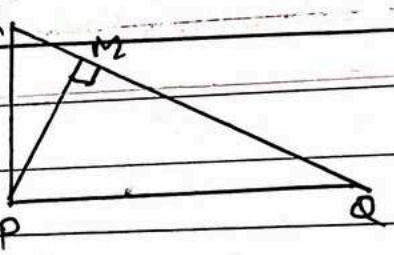
Q.No.	Question	Marks
6	Which of the following is a quadratic equation? (a) $x^2 + \frac{1}{x^2} = 2$ (b) $\sqrt{3}x^2 - 2x + \frac{1}{4} = 0$ (c) $x^3 - x^2 + x + 1 = 0$ (d) $x + \frac{4}{x} = x^2$	
7	If $x = 3$ is one root of the quadratic equation $x^2 - 2kx - 6 = 0$, then the value of k is (a) $\frac{1}{2}$ (b) $-\frac{1}{2}$ (c) 2 (d) -2	
8	The point, on x-axis, which is equidistant from $(-3, 4)$ and $(7, 6)$ is (a) $(-3, 0)$ (b) $(3, 0)$ (c) $(-2, 0)$ (d) $(2, 0)$	
9	The coordinates of the centroid of $\triangle ABC$ with vertices $A(4, -6)$, $B(-9, 7)$ and $C(13, 13)$, are (a) $\left(\frac{13}{3}, 4\right)$ (b) $\left(\frac{13}{3}, \frac{9}{2}\right)$ (c) $\left(\frac{31}{3}, \frac{28}{3}\right)$ (d) $\left(\frac{31}{3}, \frac{13}{4}\right)$	
10	The ratio in which $P(1, 6)$ divides the join of $A(4, 7)$ and $B(-2, 5)$ internally, is (a) 2 : 3 (b) 1 : 1 (c) 1 : 3 (d) 3 : 4	
11	In the figure, ABC is a triangle in which DE ∥ BC and $\frac{AD}{DB} = \frac{3}{5}$. If $AC = 4.8$ cm, then AE equals. (a) 1.8 cm (b) 1.6 cm (c) 3 cm (d) 3.2 cm	



Q.No.	Question	Marks
12.	In the figure, OA and OB are two radii of the circle with centre O. If PA and PB are tangents to the circle at A and B respectively and $\angle APB = 70^\circ$, then $m\angle AOB$ is (a) 290° (b) 110° (c) 100° (d) 20°. 	
13	If $\sin A = \frac{1}{\sqrt{2}}$, then the value of $(4\cos^2 A - \cos A)$ is (a) 3 (b) $3 - \frac{\sqrt{3}}{2}$ (c) $2 - \frac{1}{\sqrt{2}}$ (d) $2 + \frac{1}{\sqrt{2}}$	
14	If $\triangle ABC$ is an equilateral triangle, then $\sec A$ equals. (a) $\frac{2}{\sqrt{3}}$ (b) $\sqrt{2}$ (c) 1 (d) 2	
15	Which of the following is <u>not</u> an identity? (a) $1 + \sin^2 A = \cos^2 A$ (b) $1 + \tan^2 A = \sec^2 A$. (c) $\sin^2 A + \cos^2 A = 1$ (d) $1 + \cot^2 A = \operatorname{cosec}^2 A$	

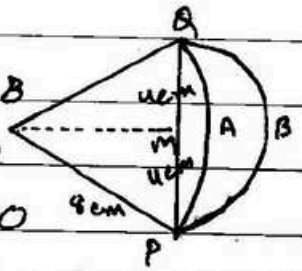
Q.No.	Question	Marks
16	In the figure, APB and AQO are semi-circles and OA = OB = 7 cm. The perimeter of the shaded region is (a) 21 cm (b) 40 cm (c) 64 cm (d) 76 cm.  	
17	A card is drawn from a well-shuffled pack of 52 playing cards at random. What is the probability that the drawn card is a face card of Spade ? (a) $\frac{12}{52}$ (b) $\frac{5}{52}$ (c) $\frac{3}{52}$ (d) $\frac{1}{52}$	
18	The median of 31, 38, 27, 28, 36, 25, 35, 40 is (a) 28 (b) 33 (c) 36 (d) 35	
	Direction: In Questions 19 and 20, a Statement of Assertion (A) is followed by a Statement of Reason (R). Read both the statements carefully and 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, but Reason (R) is not 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.	

Q.No.	Question	Marks
19	Assertion (A): The length of the tangent from a point A to a circle of radius 5 cm is 12 cm. The distance of A from the centre is 13 cm.	
	Reason (R): The tangent at any point of a circle is perpendicular to the radius through the point of contact.	
20.	Assertion (A): Two cubes each of volume 64 cu cm are joined end to end. The surface area of the resulting cuboid is 128 sq cm.	
	Reason (R): The surface area of a brick of dimensions 9 cm × 4 cm × 3 cm is 150 sq cm	
	Section B	
	Section - B consists of 5 questions of 2 marks each.	
21	Using prime factorisation method, find the HCF and LCM of 40, 125 and 280.	
22.	Find the discriminant of the equation $3x^2 + 2\sqrt{5}x - 5 = 0$ and comment upon the nature of its roots.	

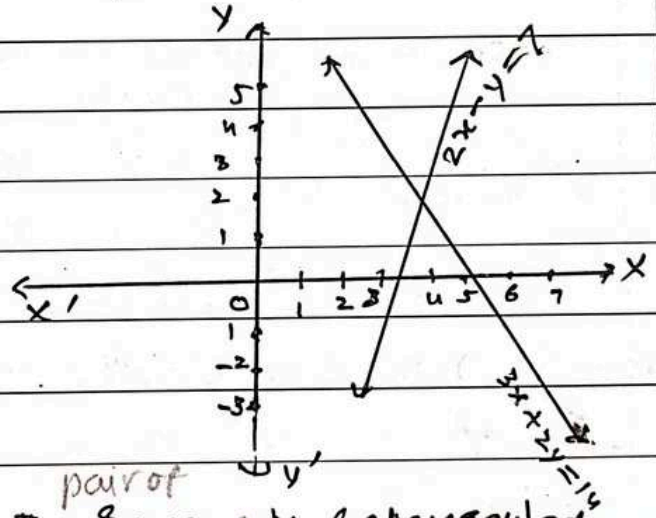
Q.No.	Question
23.	Prove that the lengths of two tangents drawn from an external point to a circle are equal.
	(OR)
	If a hexagon ABCDEF circumscribes a circle, prove that $AB+CD+EF = BC+DE+FA$.
	If a circle is circumscribed by a hexagon ABCDEF,
24.	In the figure, $\triangle PQR$ is right-angled at P. M is a point on QR such that PM is perpendicular to QR. Show that $PQ^2 = QM \times QR$
	
25	$\triangle ABC$ is right-angled at C. If $\tan A = \frac{1}{\sqrt{3}}$ and $\tan B = \sqrt{3}$, then find the value of $(\sin A \cos B + \cos A \sin B)$
	(OR)
	Prove that $\frac{\tan\theta + \sin\theta}{\tan\theta - \sin\theta} = \frac{\sec\theta + 1}{\sec\theta - 1}$
	Section-C
	Section-C consists of 6 questions of 3 marks each
26	Prove that there is no rational number whose square is 3.

Q.No.	Question	Marks
27	~~Construct a quadratic polynomial~~	
27	Solve the equations for x and y: $\frac{2}{x} + \frac{3}{y} = 11$ $\frac{5}{x} - \frac{4}{y} = -7$	
28.	Find the ratio in which the line $x - y - 2 = 0$ divides the line segment joining $(3, -1)$ and $(8, 9)$. Also, find the coordinates of the point of division. (OR) Three consecutive vertices of a parallelogram are $(-2, -1)$, $(1, 0)$ and $(4, 3)$. Find the fourth vertex	
29	In a triangle, a line drawn parallel to one side, to intersect the other two sides in distinct points, Prove that this line divides the two sides in the same ratio.	
30	An observer 1.5 m tall is 28.5 m away from a tower. The angle of elevation of the top of the tower from observer's eye is 45°. Find the height of the tower.	

Q.No.	Question	Marks
	(OR)	
	The angle of depression of a boat B from the top A of a watchtower 200 m high is 30°. Find the distance of the boat from the foot C of the watch tower.	
31	A toy is in the form of a cone mounted on a hemisphere of radius 3.5 cm. The total height of the toy is 15.5 cm. Find the total surface area and the volume of the toy.	
	Section - D	
	Section - D comprises of 4 questions of 5 marks each.	
32	Students of a class are made to stand equally in rows. If 3 students are extra in a row, there would be 1 row less. If 3 students are less in a row, there would be 2 rows more. Find the number of students in a row.	
	(OR)	
	Find the roots of the equation $\frac{x}{x+1} + \frac{x+1}{x} = \frac{34}{15}$ $(x \neq 0, x \neq -1)$	

Q.No.	Question	Marks
33.	In two concentric circles, prove that all chords of the outer circle which touch the inner circle, are of equal length	
34	In the figure, two arcs A and B are shown. Arc A is a part of the circle with centre O and radius = OP. Arc B is a part of the circle with centre at M and radius = MP, where M is the mid-point of PQ. Find the area enclosed by the two arcs. 	
	(OR)	
	From a solid cylinder whose height is 10 cm and radius 6 cm, a conical cavity of height 10cm and of base radius 6cm is hollowed out. Find the volume of the remaining solid correct to one place of decimal.	
35	Find the mean, median and mode of the following data:	

Marks obtained	0–10	10–20	20–30	30–40	40–50	50–60	60–70
Frequency	4	4	8	10	12	8	4

Q.No.	Question	Marks
	Section E	
	Section E consists of 3 case study based questions of 4 marks each.	
36	The pair of scissors is very common in our daily life use. Given below is the graph of the two blades of the pair of scissors.	
	(picture of a pair of scissors)	
		
	Let the two blades of the pair of scissors be represented by the following system of linear equations: $2x - y = 7$ and $3x + 2y = 14$	
	Based on the given information, answer the following questions:	
	i) Determine the points where the two lines representing by $2x - y = 7$ and $3x + 2y = 14$ intersect x-axis respectively.	
	ii) Determine the points where the two lines represented by $2x - y = 7$ and $3x + 2y = 14$ intersect y-axis respectively.	

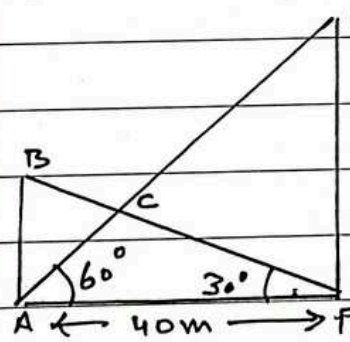
Q.No.	Question	Marks
	(iii) Determine the nature of lines.	
	(OR)	
	Determine the pivot point (point of intersection) of the two blades of the pair of scissors, represented by the equation $2x-y=7$ and $3x+2y=14$	
37	BINGO is a game of chance. The host has 75 balls numbered 1 through 75. Each player has a BINGO card with some numbers written on it. The participant cancels the number on the card when called out a number on the ball selected at random. Whosoever cancels all the numbers on his/her card, says BINGO and wins the game. The table given below, shows the data of one such game where 48 balls were used before Hari said BINGO. (picture)	

Number announced	0-15	15-30	30-45	45-60	60-75
Number of times.	8	9	10	12	9

Based on the above information, answer the following:

Q.No.	Question	Marks
	i) Write the median class.	
	ii) When first ball was picked up, what was the probability of calling out a prime number?	
	iii) Find the median of the data.	
	OR	
	Find the mode of the data.	
38.	Two poles of different heights stand on level ground and at a distance of 40 m. Both poles are supported by wires attached from the top of each pole to the bottom of the other. A coupling is placed at point C, where the two wires cross (as shown in the figure)	

Real picture



Based on the above information, answer the following questions:

i) Find the height of pole AB.

ii) Find the height of pole PQ.

Q.No.	Question	Marks
	iii) If the angle of elevation of the top of the pole PQ from the top of the pole AB is 30°, find the distance BQ.	2
	(OR)	
	If the coupling is at a height of 20m from the ground, how far down the wire from the smaller pole AB is the coupling?	2