Series MC-X-STD

Roll No. | | | | | | | |

Candidates must write the Q.P. Code on the title page of the answer-book.

Q.P. Code
MC/X/S/01

MATHEMATICS (STANDARD)

Class X • Sample Paper 01 • Session 2026–27

(As per the CBSE Sample Question Paper 2026–27 design)

Time allowed : 3 hours **Maximum Marks : 80**

NOTE

(i) Please check that this question paper contains 5 printed pages.
(ii) Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
(iii) Please check that this question paper contains 38 questions.
(iv) Please write down the serial number of the question in the answer-book before attempting it.
(v) 15 minute time has been allotted to read this question paper. The students will read the question paper only and will not write any answer on the answer-book during this period.

General Instructions :

Read the following instructions carefully and follow them :

(i) This question paper contains **38** questions. All questions are compulsory.
(ii) This question paper is divided into **five** Sections – **A, B, C, D** and **E**.
(iii) In **Section A**, Questions no. **1** to **18** are multiple choice questions (MCQs) and questions no. **19** and **20** are Assertion-Reason based questions of **1** mark each.
(iv) In **Section B**, Questions no. **21** to **25** are very short answer (VSA) type questions, carrying **2** marks each.
(v) In **Section C**, Questions no. **26** to **31** are short answer (SA) type questions, carrying **3** marks each.
(vi) In **Section D**, Questions no. **32** to **35** are long answer (LA) type questions, carrying **5** marks each.
(vii) In **Section E**, Questions no. **36** to **38** are case study based questions carrying **4** marks each.
(viii) There is no overall choice. However, an internal choice has been provided in **2** questions in **Section B**, **2** questions in **Section C**, **2** questions in **Section D**, and in all the sub-parts of **2** marks in **Section E**.
(ix) Draw neat figures wherever required. Take $\pi = \frac{22}{7}$ wherever required, if not stated.
(x) Use of calculators is **NOT** allowed.

SECTION A

This section comprises 20 Multiple Choice Questions (MCQs) carrying 1 mark each.

1. The HCF of 2472, 1284 and a third number N is 12. If their LCM is $2^3 \times 3^2 \times 5 \times 103 \times 107$, then the number N is:

(A) $2^2 \times 3^2 \times 7$ (B) $2^2 \times 3 \times 103$ (C) $2^2 \times 3^2 \times 5$ (D) $2^4 \times 3^2 \times 11$

2. If α and β are the zeroes of the polynomial $3x^2 + 6x + k$ such that $\alpha + \beta + \alpha\beta = -\frac{2}{3}$, then the value of k is:

(A) -8 (B) 8 (C) -4 (D) 4

3. The pair of linear equations $2x = 5y + 6$ and $15y = 6x - 18$ represents two lines which are:

(A) intersecting (B) parallel
(C) coincident (D) either intersecting or parallel

4. The condition for one root of the quadratic equation $ax^2+bx+c=0$ to be twice the other is:

(A) $b^2=4ac$ (B) $2b^2=9ac$ (C) $c^2=4a+b^2$ (D) $c^2=9a-b^2$

5. If the sum of the first m terms of an A.P. is $2m^2+3m$, then its second term is:

(A) 10 (B) 9 (C) 12 (D) 4

6. $ABCD$ is a trapezium with $AB \parallel DC$ whose diagonals intersect at O. If $AO=(3x-1)$ cm, $OC=(5x-3)$ cm, $BO=(2x+1)$ cm and $OD=(6x-5)$ cm, then the value of x is:

(A) $\frac{1}{2}$ (B) 2 (C) 3 (D) 1

7. The perpendicular bisector of the line segment joining the points $A(1,5)$ and $B(4,6)$ cuts the y-axis at:

(A) $(0,12)$ (B) $(0,13)$ (C) $(0,-12)$ (D) $(0,-13)$

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

(A) $\frac{7}{\sqrt{13}}$ (B) $\frac{1}{\sqrt{13}}$

(C) 3 (D) does not exist

9. The probability that a leap year selected at random has 53 Mondays is:

(A) $\frac{1}{7}$ (B) $\frac{2}{7}$ (C) $\frac{3}{7}$ (D) $\frac{5}{7}$

10. The area of the face of a clock swept by its 12 cm long minute hand in 35 minutes is:

(A) 61 cm^2 (B) 132 cm^2 (C) 264 cm^2 (D) 427 cm^2

11. A cylinder, a cone and a hemisphere have equal bases and the same height. The ratio of their volumes is:

(A) 3 : 1 : 2 (B) 3 : 2 : 1 (C) 1 : 2 : 3 (D) 1 : 3 : 2

12. If the difference of the mode and the median of a data is 24, then the difference of its median and mean is:

(A) 12 (B) 24 (C) 8 (D) 36

13. A letter is chosen at random from the letters of the word ASSASSINATION. The probability that it is a vowel is of the form $\frac{6}{2x+1}$. The value of x is:

(A) 8 (B) 7 (C) 6 (D) 5

14. The point R divides the line segment AB, where $A(-4,0)$ and $B(0,6)$, such that $AR=\frac{3}{4}AB$. The coordinates of R are:

(A) $\left(-1,\frac{9}{2}\right)$ (B) $\left(1,\frac{9}{2}\right)$ (C) $\left(-1,-\frac{9}{2}\right)$ (D) $\left(-\frac{3}{2},\frac{9}{2}\right)$

15. If the area of a sector of a circle bounded by an arc of length 5π cm is 20π cm^2, then the radius of the circle is:

(A) 12 cm (B) 16 cm (C) 8 cm (D) 10 cm

16. The mean and median of the data a, b and c are 50 and 35 respectively, where $a<b<c$. If $c-a=55$, then $(b-a)$ is:

(A) 8 (B) 7 (C) 3 (D) 5

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17. From the top of a 7 m high building, the angle of elevation of the top of a tower is 60° and the angle of depression of its foot is 45°. The height of the tower is:

(A) $7\sqrt{3}$ m (B) $7(\sqrt{3}+1)$ m (C) $7(\sqrt{3}-1)$ m (D) 14 m

18. A bag contains 5 red dolls and n green dolls. If the probability of drawing a green doll is three times that of drawing a red doll, then the value of n is:

(A) 18 (B) 15 (C) 10 (D) 20

*Questions number **19** and **20** are Assertion and Reason based questions. Two statements are given, one is labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.*

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is ***not*** the correct explanation of the 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) :* The point on the x-axis which is equidistant from the points $A(-2, 3)$ and $B(5, 4)$ is $(2, 0)$.

Reason (R) : The coordinates of the point $P(x, y)$ which divides the line segment joining $A(x_1, y_1)$ and $B(x_2, y_2)$ in the ratio $m_1 : m_2$ are $\left(\frac{m_1x_2+m_2x_1}{m_1+m_2}, \frac{m_1y_2+m_2y_1}{m_1+m_2}\right)$.

20. *Assertion (A) :* If one zero of the polynomial $p(x) = 4x^2 - 8kx - 9$ is the negative of the other, then $k = 0$.

Reason (R) : The sum of the zeroes of the quadratic polynomial $ax^2 + bx + c$ is $-\frac{b}{a}$.

SECTION B

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

21. (a) A fruit vendor has 990 apples and 945 oranges. He packs them into baskets so that each basket contains fruits of only one kind and every basket has the same number of fruits. Find the least number of baskets required.

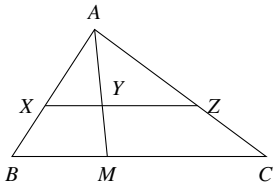
OR

(b) The LCM of two numbers is 14 times their HCF. The sum of the LCM and the HCF is 600. If one of the numbers is 280, find the other number.

22. (a) In $\triangle ABC$, P and Q are points on AB and AC respectively such that $PQ \parallel BC$. Prove that the median AD drawn from A to BC bisects PQ.

OR

(b) In the given figure, $XZ \parallel BC$ and AM meets XZ at Y. If $AZ = 3$ cm, $ZC = 2$ cm, $BM = 3$ cm and $MC = 5$ cm, find the length of XY.



23. If $2\cos(2x-6)^\circ = 1$, where $(2x-6)^\circ$ is an acute angle, find the value of $\sin(2x-21)^\circ + \tan(x+12)^\circ$.

24. Find the area of the minor segment of a circle of radius 14 cm, if the length of the corresponding arc is 22 cm.

25. A box contains balls bearing the numbers $12, 13, 14, \ldots, 39$. A ball is drawn at random. Find the probability that the number on the ball is (i) a prime number, (ii) divisible by 3 or 5.

SECTION C

This section comprises 6 Short Answer (SA) type questions carrying 3 marks each.

26. Prove that $\sqrt{3}$ is an irrational number.

27. If α and β are the zeroes of the polynomial $x^2 - x - 2$, find a quadratic polynomial whose zeroes are $(2\alpha + 1)$ and $(2\beta + 1)$.

28. (a) If 7 times the 7^{th} term of an A.P. is equal to 11 times its 11^{th} term, show that its 18^{th} term is zero.

OR

(b) The ratio of the 11^{th} term to the 17^{th} term of an A.P. is $3 : 4$. Find the ratio of its 5^{th} term to its 21^{st} term, and the ratio of the sum of its first 5 terms to that of its first 21 terms.

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

30. Find the point on the y-axis which is equidistant from the points $A(6, 5)$ and $B(-4, 3)$. Also find the ratio in which the y-axis divides the line segment AB.

31. (a) Prove that: $\dfrac{\tan\theta}{1-\cot\theta} + \dfrac{\cot\theta}{1-\tan\theta} = 1 + \sec\theta\,\text{cosec}\,\theta$

OR

(b) Prove that: $\dfrac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \text{cosec}\,A + \cot A$

SECTION D

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

32. A trader bought a number of articles for ₹900. Five articles were found damaged. He sold each of the remaining articles at ₹2 more than what he paid for it and got a profit of ₹80 on the whole transaction. Find the number of articles he bought and the selling price of each article.

33. Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio. Using this result, prove that a line drawn through the point of intersection of the diagonals of a trapezium, parallel to its parallel sides, divides the non-parallel sides in the same ratio.

34. (a) A toy consists of a cylinder of diameter 14 cm and height 21 cm, surmounted by a cone whose vertical angle is 90°. Find the total surface area of the toy. (Use $\sqrt{2} = 1.41$)

OR

(b) A toy is in the shape of a solid cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 21 cm and 40 cm respectively, and the height of the cone is 15 cm, find the total surface area of the toy. (Take $\pi = 3.14$)

35. (a) Two windows of a house are at heights 2 m and 6 m above the ground, one vertically above the other. From these windows the angles of elevation of a balloon are 60° and 30° respectively. Find the height of the balloon above the ground and its distance from each window.

OR

(b) India Gate is 42 m tall. Shreya, whose eyes are 1 m above the ground, sees its top at an angle of elevation of 45°. She walks back along a straight line until the angle of elevation becomes 30°. Find how far she walked back and her final distance from India Gate. (Use $\sqrt{3} = 1.73$)

SECTION E

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

36. Places A and B are 80 km apart on a highway. One car starts from A and another from B at the same time. If they move in the same direction, they meet in 8 hours; if they move towards each other, they meet in 1 hour 20 minutes. Let the speeds of the cars from A and B be x km/h and y km/h ($x > y$). Based on the above information, answer the following questions:

(i) Form a linear equation when the cars move in the same direction. *1*

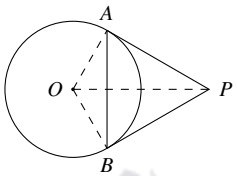
(ii) Form a linear equation when the cars move towards each other. *1*

(iii) (a) Find the speeds of the two cars. *2*

OR

(iii) (b) If the car from A increases its speed by 5 km/h, how long would the cars take to meet when moving towards each other? *2*

37. A circular park has its centre at O. Two straight tracks PA and PB are tangents to the circular boundary from the gate P. A straight path AB joins the points of contact; $AB = 6$ m and it makes an angle of 30° with the radius OA. Based on the above information, answer the following questions:



(i) What is the measure of $\angle OAP$? *1*

(ii) Find the length of the track PA. *1*

(iii) (a) Find the radius of the park. *2*

OR

(iii) (b) Find the distance OP of the gate from the centre. *2*

38. The daily wages (in AED) of 60 workers of a company are given below. The median of the distribution is 28.5. Based on the above information, answer the following questions:

Wages (AED)	0–10	10–20	20–30	30–40	40–50	50–60	**Total**
No. of workers	5	x	20	15	y	5	60

(i) Write the relation between x and y. *1*

(ii) Write the median class. *1*

(iii) (a) Find the values of x and y. *2*

OR

(iii) (b) Taking $x = 8$ and $y = 7$, find the mode. *2*

• • • End of Question Paper • • •

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