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/06

MATHEMATICS (STANDARD)

Class X • Sample Paper 06 • 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. If $\text{HCF}(306, 657) = 9$, then $\text{LCM}(306, 657)$ is:

(A) 22338 (B) 22328 (C) 20338 (D) 201042

2. If α and β are the zeroes of the polynomial $x^2 - p(x+1) - c$ such that $(\alpha+1)(\beta+1) = 0$, then the value of c is:

(A) 1 (B) 0 (C) -1 (D) 2

3. The lines represented by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel if k is:

(A) $\frac{15}{4}$ (B) $\frac{4}{15}$ (C) $\frac{3}{2}$ (D) $\frac{2}{5}$

4. If the roots of $(a-b)x^2 + (b-c)x + (c-a) = 0$, $a \neq b$, are equal, then:

(A) $2a = b + c$ (B) $2b = a + c$ (C) $2c = a + b$ (D) $a + b + c = 0$

5. The next term of the A.P. $\sqrt{8},\ \sqrt{18},\ \sqrt{32},\ \ldots$ is:

(A) $5\sqrt{2}$ (B) $5\sqrt{3}$ (C) $3\sqrt{3}$ (D) $6\sqrt{2}$

6. $\triangle ABC \sim \triangle DEF$ with $AB = 4$ cm and $DE = 6$ cm. If the perimeter of $\triangle ABC$ is 18 cm, then the perimeter of $\triangle DEF$ is:

(A) 27 cm (B) 12 cm (C) 36 cm (D) 24 cm

7. The line segment joining $A(3, -4)$ and $B(1, 2)$ is trisected at $P(p, -2)$ and $Q\left(\frac{5}{3}, q\right)$. The values of p and q are:

(A) $\frac{7}{3},\ 0$ (B) $\frac{5}{3},\ 0$ (C) $\frac{7}{3},\ 1$ (D) $2,\ 0$

8. If $16\cot x = 12$, then the value of $\frac{\sin x - \cos x}{\sin x + \cos x}$ is:

(A) $\frac{1}{7}$ (B) $\frac{3}{7}$ (C) $\frac{2}{7}$ (D) 0

9. A bag contains 5 red, 8 blue and 7 yellow balls. A ball is drawn at random. The probability that it is neither blue nor red is:

(A) $\frac{13}{20}$ (B) $\frac{2}{5}$ (C) $\frac{7}{20}$ (D) $\frac{1}{4}$

10. The perimeter of a quadrant of a circle of radius 14 cm is:

(A) 50 cm (B) 22 cm (C) 36 cm (D) 44 cm

11. The sum of the length, breadth and height of a cuboid is $6\sqrt{3}$ cm and the length of its diagonal is $2\sqrt{3}$ cm. The total surface area of the cuboid is:

(A) 48 cm^2 (B) 72 cm^2 (C) 96 cm^2 (D) 108 cm^2

12. The median of the first ten prime numbers is:

(A) 11 (B) 12 (C) 13 (D) 15

13. A die is thrown twice. The probability that 5 will not come up either time is:

(A) $\frac{25}{36}$ (B) $\frac{11}{36}$ (C) $\frac{1}{6}$ (D) $\frac{5}{6}$

14. $AOBC$ is a rectangle whose three vertices are $A(0, 3)$, $O(0, 0)$ and $B(5, 0)$. The length of its diagonal is:

(A) $\sqrt{34}$ units (B) 5 units (C) 3 units (D) 8 units

15. The area of the circle inscribed in a square of side 14 cm is:

(A) 154 cm^2 (B) 196 cm^2 (C) 616 cm^2 (D) 44 cm^2

16. For a data, the mean is 50 and the median is 47. Using the empirical relation, the mode is:

(A) 41 (B) 44 (C) 47 (D) 53

17. The ratio of the height of a tower to the length of its shadow is $\sqrt{3} : 1$. The angle of elevation of the Sun is:

(A) 30° (B) 45° (C) 60° (D) 90°

18. In a game, a coin is tossed three times; the player wins if all tosses show the same result. The probability of losing the game is:

(A) $\frac{1}{4}$ (B) $\frac{3}{4}$ (C) $\frac{1}{2}$ (D) $\frac{1}{8}$

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*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 mid-point of the line segment joining $A(2, 4)$ and $B(-2, -4)$ is the origin.

Reason (R) : The mid-point of the join of (x_1, y_1) and (x_2, y_2) is $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$.

20. *Assertion (A) :* If the product of the zeroes of $ax^2 - 6x - 6$ is 4, then $a = -\frac{3}{2}$.

Reason (R) : The product of the zeroes of $ax^2 + bx + c$ is $\frac{c}{a}$.

SECTION B

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

21. (a) Check whether 6^n can end with the digit 0 for any natural number n. Justify.

OR

(b) Find the HCF of 96 and 404 by prime factorisation. Hence, find their LCM.

22. (a) D is a point on the side BC of $\triangle ABC$ such that $\angle ADC = \angle BAC$. Show that $CA^2 = CB \cdot CD$.

OR

(b) In $\triangle ABC$, $DE \parallel BC$ with D on AB and E on AC. If $AD = 2.5$ cm, $BD = 3$ cm and $AE = 3.75$ cm, find AC.

23. If $\sin\alpha = \frac{1}{2}$ and $\cot\beta = \sqrt{3}$, where α, β are acute, find the value of $\operatorname{cosec}\alpha + \operatorname{cosec}\beta$.

24. A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding minor segment. (Use $\pi = 3.14$)

25. Two dice are thrown simultaneously. Find the probability that (i) the sum of the numbers is at least 10, (ii) the product of the numbers is 6.

SECTION C

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

26. Prove that $\sqrt{11}$ is an irrational number.

27. If one zero of the polynomial $3x^2 - 8x + (2k + 1)$ is seven times the other, find both the zeroes and the value of k.

28. (a) An auditorium is to seat at least 1500 people in concentric circular rows, each row having 10 seats more than the previous one. If the first row has 30 seats, how many rows are needed for exactly 1500 seats? How many seats are in the 10^{th} row?

OR

(b) Find the number of terms of the A.P. $18, 15\frac{1}{2}, 13, \ldots, -47$ and find their sum.

29. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

30. Find the ratio in which the y-axis divides the line segment joining $A(5, -6)$ and $B(-1, -4)$. Also find the point of intersection.

31. (a) Prove that: $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$

OR

(b) If $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$, show that $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$.

SECTION D

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

32. 500 notebooks were distributed equally among some students. If there had been 25 more students, each would have received one notebook less. Find the number of students and the number of notebooks each received.

33. State and prove the Basic Proportionality Theorem. Using it, prove the following: In quadrilateral $ABCD$ with diagonal AC, L is a point on AC; $LM \parallel CB$ meets AB at M and $LN \parallel CD$ meets AD at N. Prove that $\frac{AM}{AB} = \frac{AN}{AD}$.

34. (a) A wooden toy is made by scooping out a hemisphere of the same radius from each end of a solid cylinder of height 10 cm and base radius 3.5 cm. Find the volume of wood in the toy and its total surface area.

OR

(b) A toy rocket is a right circular cylinder closed at the lower end and surmounted by a cone of the same radius. The diameter and height of the cylinder are 6 cm and 12 cm, and the slant height of the cone is 5 cm. Find the surface area and the volume of the rocket. (Use $\pi = 3.14$)

35. (a) A boy whose eye level is 1.35 m above the ground spots a balloon moving horizontally with the wind. The angle of elevation of the balloon from his eyes is 60°; after 12 seconds it becomes 30°. If the speed of the wind is 3 m/s, find the height of the balloon above the ground. (Use $\sqrt{3} = 1.73$)

OR

(b) From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45°. If the bridge is 3 m above the water, find the width of the river and the distances of the point from the two banks (along the lines of sight).

SECTION E

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

36. While designing the school year book, a teacher asked students that the length and width of a photo, 18 cm long and 12 cm wide, be increased by x units each, so that the area of the photo is doubled. Based on the above information, answer the following questions:

(i) Write an algebraic equation depicting the above information. *1*

(ii) Write the corresponding quadratic equation in standard form. *1*

(iii) (a) Find the dimensions of the enlarged photo. *2*

OR

(iii) (b) Can any rational value of x make the new area equal to 220 cm^2? Justify. *2*

37. A circular running track has two concentric boundaries with centre O, of radii 5 m and 3 m. A straight hurdle-line AB is a chord of the outer boundary touching the inner boundary at M. Based on the above information, answer the following questions:

(i) Find the length of AB. *1*

(ii) Why is AB bisected at M? *1*

(iii) (a) From a point P outside, tangents PA' and PB' are drawn to the outer and inner boundaries. If $PA' = 12$ m, find PB'. *2*

OR

(iii) (b) If two tangents drawn from P to the outer boundary are inclined at 60°, find OP. *2*

38. The following data gives the weights (in kg) of 120 packets: Based on the above information, answer the following questions:

Weight	85–90	90–95	95–100	100–105	105–110	110–115
Packets	15	22	20	18	20	25

(i) Write the modal class. *1*

(ii) Write the median class. *1*

(iii) (a) Find the mean weight. *2*

OR

(iii) (b) Find the median weight. *2*

• • • End of Question Paper • • •

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