Series MC-X-BSC

Roll No. | | | | | | | |

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

Q.P. Code
MC/X/B/04

MATHEMATICS (BASIC)

Class X • Sample Paper 04 • Session 2026–27

(As per the CBSE Sample Question Paper 2026–27 (Basic) 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 least number which is exactly divisible by each of 2, 3, 4, 5 and 6 is:

(A) 60 (B) 120 (C) 30 (D) 90

2. If $x = 2$ is a zero of the polynomial $2x^2 + 3x - p$, then the value of p is:

(A) 14 (B) -14 (C) 2 (D) -2

3. The pair of linear equations $2x + 3y = 9$ and $4x + 6y = 18$ has:

(A) a unique solution (B) no solution

(C) infinitely many solutions (D) exactly two solutions

4. The cost of 2 notebooks and 3 pens is ₹46, and the cost of 3 notebooks and 2 pens is ₹44. The cost of one pen is:

(A) ₹8 (B) ₹10 (C) ₹12 (D) ₹18

5. Which of the following quadratic equations has two distinct real roots?

(A) $x^2+x+1=0$ (B) $x^2-4x+4=0$ (C) $2x^2-3x-2=0$ (D) $x^2+2x+5=0$

6. For an A.P. with first term -3 and common difference 4, the term which is equal to 81 is the:

(A) 21^{st} term (B) 22^{nd} term (C) 23^{rd} term (D) 20^{th} term

7. The sum of the first 10 terms of the A.P. $2, 7, 12, \ldots$ is:

(A) 245 (B) 255 (C) 235 (D) 490

8. The coordinates of the point which divides the line segment joining $A(-2, 4)$ and $B(8, -6)$ internally in the ratio $3:2$ are:

(A) $(4, -2)$ (B) $(2, 0)$ (C) $(4, 2)$ (D) $(-4, 2)$

9. Which of the following cannot be the probability of an event?

(A) $\frac{2}{3}$ (B) -1.5 (C) 15% (D) 0.7

10. The median class of the following distribution is:

Class	0–10	10–20	20–30	30–40	40–50
Frequency	10	15	12	20	9

(A) 10–20 (B) 20–30 (C) 30–40 (D) 40–50

11. A point P is 26 cm away from the centre of a circle and the length of the tangent drawn from P to the circle is 24 cm. The radius of the circle is:

(A) 10 cm (B) 12 cm (C) 2 cm (D) $\sqrt{52}$ cm

12. If the median and the mean of a distribution are 137 and 137.05 respectively, then its mode is:

(A) 136.9 (B) 137.1 (C) 137 (D) 136.8

13. The angle of elevation of the top of a tower from a point on the ground, 30 m away from its foot, is 60°. The height of the tower is:

(A) $30\sqrt{3}$ m (B) $10\sqrt{3}$ m (C) 30 m (D) 60 m

14. If $\sec\theta = \frac{5}{4}$, where θ is acute, then $\tan\theta$ is:

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

15. If $\triangle ABC \sim \triangle PQR$ with $AB = 4$ cm, $BC = 6$ cm and $PQ = 6$ cm, then QR is:

(A) 9 cm (B) 4 cm (C) 8 cm (D) 12 cm

16. Which of the following is **not** a criterion for the similarity of two triangles?

(A) AA (B) SAS (C) SSS (D) RHS

17. PQ is a tangent at a point Q of a circle with centre O. If $\angle POQ = 70^\circ$, then $\angle OPQ$ is:

(A) 20° (B) 70° (C) 110° (D) 90°

18. The total surface area of a solid hemisphere of radius 3.5 cm is:

(A) 115.5 cm^2 (B) 77 cm^2 (C) 38.5 cm^2 (D) 154 cm^2

*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 probability of a sure event is 1.

Reason (R) : The probability of an impossible event is 0.

20. *Assertion (A) :* In $\triangle ABC$, $DE \parallel BC$ with D on AB and E on AC. If $\frac{AD}{DB} = \frac{1}{2}$ and $AE = 2$ cm, then $EC = 4$ cm.

Reason (R) : If $DE \parallel BC$ in $\triangle ABC$, then $\frac{AD}{AB} = \frac{DB}{AC}$.

SECTION B

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

21. (a) Two bells toll at intervals of 18 minutes and 24 minutes respectively. If they toll together at 8:00 a.m., at what time will they next toll together?

OR

(b) Given that HCF$(120, 144) = 24$, find LCM$(120, 144)$.

22. Evaluate: $4\cot^2 45° - \sec^2 60° + \sin^2 60° + \cos^2 90°$

23. Find the zeroes of the quadratic polynomial $5x^2 - 4 - 8x$ and verify the relationship between the zeroes and the coefficients.

24. The angle between the two tangents drawn from an external point P to a circle of radius a and centre O is $60°$. Find the length of OP.

25. (a) Find a relation between x and y such that the point (x, y) is equidistant from the points $(2, 1)$ and $(-1, 3)$.

OR

(b) Using the distance formula, show that the points $(1, -1)$, $(5, 2)$ and $(9, 5)$ are collinear.

SECTION C

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

26. Given that $\sqrt{5}$ is irrational, prove that $4 - \sqrt{5}$ is an irrational number.

27. (a) Prove that the perpendicular at the point of contact to the tangent to a circle passes through the centre.

OR

(b) Two tangents PA and PB are drawn from an external point P to a circle with centre O. If $\angle APB = 50°$, find $\angle AOB$ and $\angle OAB$.

28. $A(1, 3)$ and $B(11, -2)$ are two points. Find the coordinates of the point P on the line segment AB such that $AP = \frac{2}{5}AB$.

29. Prove that: $\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} = 2\sec A$

30. (a) Find the mean of the following distribution:

Marks	0–10	10–20	20–30	30–40	40–50
No. of students	4	6	10	12	8

OR

(b) Find the mode of the following distribution:

Class	20–30	30–40	40–50	50–60	60–70
Frequency	8	14	20	12	6

31. A shopkeeper sells a saree at 8% profit and a sweater at 10% discount, thereby getting ₹ 1008. If she had sold the saree at 10% profit and the sweater at 8% discount, she would have got ₹ 1028. Find the cost price of the saree and the list price of the sweater.

SECTION D

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

32. State and prove the Basic Proportionality Theorem. Using it, find AB if in $\triangle ABC$, $DE \parallel BC$ with D on AB and E on AC, $AD = 2.4$ cm, $AE = 3.2$ cm and $EC = 4.8$ cm.

33. (a) The hypotenuse of a right triangle is 25 cm. The difference between the lengths of the other two sides is 5 cm. Find the lengths of these sides.

OR

(b) A two-digit number is such that the product of its digits is 18. When 63 is subtracted from the number, the digits interchange their places. Find the number.

34. A tent is in the shape of a cylinder surmounted by a conical top. The diameter of the base is 14 m, the height of the cylindrical part is 3 m and the slant height of the conical top is 10 m. Find the area of the canvas used to make the tent and its cost at the rate of ₹ 50 per m^2. (The base is not covered.)

35. (a) A bird is sitting on the top of an 80 m high tree. From a point on the ground, the angle of elevation of the bird is $45°$. The bird flies away horizontally in such a way that it remains at a constant height. After 2 seconds, the angle of elevation of the bird from the same point is $30°$. Find the speed of the bird. (Use $\sqrt{3} = 1.732$)

OR

(b) An aeroplane is flying horizontally at an altitude of 1200 m. From a point on the ground, the angle of elevation of the aeroplane changes from $60°$ to $30°$ in 10 seconds. Find the distance covered by the aeroplane in this time and its speed. (Use $\sqrt{3} = 1.732$)

SECTION E

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

36. The minute hand of a wall clock is 14 cm long. Based on the above information, answer the following questions:

(i) Find the angle through which the minute hand turns in 15 minutes. *1*

(ii) Find the area swept by the minute hand in 15 minutes. *1*

(iii) (a) Find the area swept by the minute hand between 9:00 a.m. and 9:25 a.m. *2*

OR

(iii) (b) Find the distance travelled by the tip of the minute hand in 20 minutes. *2*

37. A gardener plants saplings in rows. He plants 5 saplings in the first row, 8 in the second row, 11 in the third row and so on. Based on the above information, answer the following questions:

(i) How many saplings are there in the 10^{th} row? *1*

(ii) Which row has 50 saplings? *1*

(iii) (a) Find the total number of saplings in the first 12 rows. *2*

OR

(iii) (b) How many rows are needed to plant 185 saplings? *2*

38. A jar contains 24 marbles, some green and the others blue. A marble is drawn at random from the jar. The probability that it is green is $\frac{2}{3}$. Based on the above information, answer the following questions:

(i) Find the number of green marbles in the jar. *1*

(ii) Find the probability that the marble drawn is blue. *1*

(iii) (a) If 4 more blue marbles are put into the jar, find the probability of drawing a blue marble. *2*

OR

(iii) (b) How many green marbles should be taken out of the jar so that the probability of drawing a green marble becomes $\frac{1}{2}$? *2*

• • • End of Question Paper • • •

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