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/05

MATHEMATICS (BASIC)

Class X • Sample Paper 05 • 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 prime factorisation of 156 is:

(A) $2^2 \times 3 \times 13$ (B) $2 \times 3^2 \times 13$ (C) $2^2 \times 3^2 \times 13$ (D) $2 \times 3 \times 13$

2. If α and β are the zeroes of the polynomial $x^2 - 5x + 6$, then the value of $\alpha + \beta - \alpha\beta$ is:

(A) -1 (B) 1 (C) 11 (D) -11

3. If $2x + 3y = 12$ and $3x - 2y = 5$, then the value of x is:

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

4. The perimeter of a rectangle is 40 cm and its length is 4 cm more than its breadth. The length of the rectangle is:

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

5. If one root of the quadratic equation $x^2 + kx - 8 = 0$ is 2, then its other root is:

(A) -4 (B) 4 (C) -2 (D) 2

6. If $18, a, b, -3$ are in A.P., then $a + b$ is equal to:

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

7. The first and the last terms of an A.P. are 5 and 45 respectively. If the sum of its terms is 400, the number of terms is:

(A) 16 (B) 15 (C) 20 (D) 8

8. The point on the x-axis which divides the line segment joining $(2, -3)$ and $(5, 6)$ is:

(A) $(3, 0)$ (B) $(4, 0)$ (C) $(1, 0)$ (D) $(0, 3)$

9. A number is selected at random from the numbers 1 to 20. The probability that it is a multiple of 4 is:

(A) $\frac{1}{4}$ (B) $\frac{1}{5}$ (C) $\frac{1}{10}$ (D) $\frac{3}{20}$

10. The median class of the following distribution is:

Weight (kg)	40–45	45–50	50–55	55–60	60–65	65–70	70–75
No. of persons	2	3	8	6	6	3	2

(A) 50–55 (B) 55–60 (C) 60–65 (D) 45–50

11. PA and PB are tangents from a point P to a circle with centre O and radius 6 cm. If $OP = 10$ cm, then $PA + PB$ is:

(A) 16 cm (B) 8 cm (C) 12 cm (D) 20 cm

12. If the mode and the mean of a distribution are 24.5 and 29.75 respectively, then its median is:

(A) 28 (B) 27.5 (C) 26 (D) 29

13. The angle of elevation of the top of a 15 m tall tree from a point on the ground is 30°. The distance of the point from the foot of the tree is:

(A) $15\sqrt{3}$ m (B) 15 m (C) $5\sqrt{3}$ m (D) 30 m

14. The value of $\frac{1 - \tan^2 45^\circ}{1 + \tan^2 45^\circ}$ is:

(A) 0 (B) 1 (C) $\frac{1}{2}$ (D) $\sin 45^\circ$

15. If $\triangle ABC \sim \triangle DEF$ with $AB = 6$ cm, $DE = 9$ cm and $AC = 8$ cm, then DF is:

(A) 12 cm (B) 10 cm (C) 16 cm (D) 5.33 cm

16. In two triangles ABC and PQR, if $\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$, then:

(A) $\triangle PQR \sim \triangle CAB$ (B) $\triangle PQR \sim \triangle ABC$ (C) $\triangle CBA \sim \triangle PQR$ (D) $\triangle BCA \sim \triangle PQR$

17. The number of tangents that can be drawn to a circle from a point lying inside the circle is:

(A) 0 (B) 1

(C) 2 (D) infinitely many

18. The volume of a right circular cone of base radius 3 cm and height 7 cm is:

(A) 66 cm^3 (B) 198 cm^3 (C) 22 cm^3 (D) 132 cm^3

*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) :* When two coins are tossed together, the probability of getting at least one head is $\frac{3}{4}$.

Reason (R) : When two coins are tossed together, the possible outcomes are HH, HT, TH and TT, which are equally likely.

20. *Assertion (A) :* D and E are points on the sides PQ and PR of $\triangle PQR$ such that $PD = 4$ cm, $DQ = 4.5$ cm, $PE = 8$ cm and $ER = 9$ cm. Then $DE \parallel QR$.

Reason (R) : If a line divides any two sides of a triangle in the same ratio, then the line is parallel to the third side.

SECTION B

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

21. (a) Find the HCF and LCM of 52 and 117 by the prime factorisation method.

OR

(b) Find the smallest number which, when divided by 12, 16 and 24, leaves a remainder 5 in each case.

22. If $\sin A = \frac{5}{13}$, where A is acute, find the value of $\tan A + \sec A$.

23. Find a quadratic polynomial whose zeroes are $5 + \sqrt{2}$ and $5 - \sqrt{2}$.

24. Prove that the tangents drawn from an external point to a circle subtend equal angles at the centre.

25. (a) AB is a diameter of a circle with centre $(-1, 2)$. If the coordinates of B are $(3, 5)$, find the coordinates of A.

OR

(b) Find the value of a if the distance between the points $A(-3, -14)$ and $B(a, -5)$ is 9 units.

SECTION C

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

26. Given that $\sqrt{2}$ is irrational, prove that $3\sqrt{2}$ is an irrational number.

27. (a) Prove that the line segment joining the points of contact of two parallel tangents to a circle passes through its centre.

OR

(b) Prove that the tangent drawn at the mid-point of an arc of a circle is parallel to the chord joining the end points of the arc.

28. If the point $P(9a - 2, -b)$ divides the line segment joining $A(3a + 1, -3)$ and $B(8a, 5)$ in the ratio $3 : 1$, find the values of a and b.

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

30. (a) The mean of the following distribution is 50. Find the missing frequency p.

Class	0–20	20–40	40–60	60–80	80–100
Frequency	6	p	12	8	4

OR

(b) Find the mode of the following distribution:

Class	10–20	20–30	30–40	40–50	50–60
Frequency	4	9	16	12	6

31. For a school play, 2 adult tickets and 3 child tickets cost ₹ 230, while 3 adult tickets and 2 child tickets cost ₹ 245. Find the cost of an adult ticket and of a child ticket.

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, solve: In $\triangle ABC$, D and E are points on AB and AC such that $DE \parallel BC$. If $AD = 6$ cm, $DB = 9$ cm and $AE = 8$ cm, find AC. Also, if $DE = 4$ cm, find BC.

33. (a) A person on tour has ₹ 360 for his daily expenses. If he extends his tour by 4 days, he has to cut down his daily expenses by ₹ 3. Find the original duration of the tour.

OR

(b) The sum of two numbers is 15 and the sum of their reciprocals is $\frac{3}{10}$. Find the numbers.

34. A solid is in the shape of a cylinder with two hemispherical ends. The total length of the solid is 19 cm and its diameter is 7 cm. Find the volume and the total surface area of the solid.

35. (a) A person standing on the bank of a river observes that the angle of elevation of the top of a tree standing on the opposite bank is $60°$. When he moves 40 m away from the bank, he finds the angle of elevation to be $30°$. Find the height of the tree and the width of the river. (Use $\sqrt{3} = 1.732$)

OR

(b) From a window 15 m high above the ground in a street, the angles of elevation and depression of the top and the foot of another house on the opposite side of the street are $30°$ and $45°$ respectively. Find the height of the opposite house. (Use $\sqrt{3} = 1.732$)

SECTION E

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

36. In one corner of a rectangular lawn of size 40 m × 30 m, a flower bed is made in the shape of a quadrant of a circle of radius 14 m, with its centre at the corner of the lawn. Based on the above information, answer the following questions:

(i) Find the area of the flower bed. *1*

(ii) Find the length of the curved edge of the flower bed. *1*

(iii) (a) Find the area of the lawn excluding the flower bed. *2*

OR

(iii) (b) Find the cost of fencing the complete boundary of the flower bed at ₹ 20 per metre. *2*

37. Raj joined a job at an annual salary of ₹ 3,00,000 with an annual increment of ₹ 20,000. Based on the above information, answer the following questions:

(i) What will be his annual salary in the 5^{th} year? *1*

(ii) In which year will his annual salary be ₹ 5,00,000? *1*

(iii) (a) Find his total earnings in the first 10 years. *2*

OR

(iii) (b) In which year will his annual salary become double his first year's salary? *2*

38. The class monitor of a class is to be chosen by a lucky draw from 12 boys and 8 girls. Among the boys, 4 wear spectacles, and among the girls, 2 wear spectacles. Based on the above information, answer the following questions:

(i) Find the probability that the monitor chosen is a girl. *1*

(ii) Find the probability that the monitor chosen is a boy. *1*

(iii) (a) Find the probability that the monitor chosen wears spectacles. *2*

OR

(iii) (b) If 5 more girls join the class before the draw, find the probability that the monitor chosen is a girl. *2*

• • • End of Question Paper • • •

Website: www.infinitythinkbeyond.co.in • WhatsApp group: chat.whatsapp.com/ICdBeP9GNOd4hOdZxC6C5W

INFINITY
THINK BEYOND.....
AN EDUCATIONAL INSTITUTE