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/07

MATHEMATICS (BASIC)

Class X • Sample Paper 07 • 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 LCM of the two co-prime numbers 9 and 16 is:

(A) 144 (B) 1 (C) 25 (D) 72

2. The sum and the product of the zeroes of the polynomial $2x^2 - 8x + 6$ are respectively:

(A) $4, 3$ (B) $-4, 3$ (C) $4, -3$ (D) $3, 4$

3. The pair of linear equations $5x - 4y + 8 = 0$ and $7x + 6y - 9 = 0$ has:

(A) a unique solution (B) no solution

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

4. The sum of the digits of a two-digit number is 8 and its tens digit is three times its units digit. The number is:

(A) 62 (B) 26 (C) 53 (D) 71

5. The roots of the quadratic equation $3x^2 - 4\sqrt{3}x + 4 = 0$ are:

(A) real and equal (B) real and distinct

(C) not real (D) more than two in number

6. If the common difference of an A.P. is 5, then $a_{18} - a_{13}$ is:

(A) 25 (B) 5 (C) 20 (D) 30

7. The sum of the first 100 natural numbers is:

(A) 5050 (B) 5000 (C) 5100 (D) 10100

8. The ratio in which the point $(4, m)$ divides the line segment joining $(2, 3)$ and $(6, -3)$ is:

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

9. Two coins are tossed together. The probability of getting no head is:

(A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) $\frac{3}{4}$ (D) 0

10. The class mark of the median class of the following distribution is:

Class	0–10	10–20	20–30	30–40	40–50
Frequency	2	5	9	12	7

(A) 25 (B) 35 (C) 30 (D) 40

11. The length of the tangent drawn from a point A, at a distance of 5 cm from the centre of a circle of radius 3 cm, is:

(A) 4 cm (B) 8 cm (C) 2 cm (D) $\sqrt{34}$ cm

12. If the mean and the median of a data are 20 and 22 respectively, then its mode is:

(A) 26 (B) 24 (C) 18 (D) 22

13. The angle of depression of a boat from the top of a 50 m high cliff is $45°$. The distance of the boat from the foot of the cliff is:

(A) 50 m (B) $50\sqrt{3}$ m (C) 25 m (D) 100 m

14. The value of $\tan 30° \times \cot 60°$ is:

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

15. If $\triangle ABC \sim \triangle DEF$ with $BC = 3$ cm, $EF = 4$ cm and $AB = 6$ cm, then DE is:

(A) 8 cm (B) 4.5 cm (C) 12 cm (D) 6 cm

16. Two triangles are similar if their corresponding angles are equal and their corresponding sides are:

(A) proportional (B) equal (C) parallel (D) perpendicular

17. OA and OB are the radii of a circle with centre O through the points of contact of tangents PA and PB. If $\angle AOB = 120°$, then $\angle APB$ is:

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

18. The volume of a sphere of radius 3 cm is:

(A) 36π cm^3 (B) 27π cm^3 (C) 12π cm^3 (D) 9π 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) :* If the probability that it will rain tomorrow is 0.85, then the probability that it will not rain tomorrow is 0.15.

Reason (R) : For any event E, $P(E) + P(\text{not } E) = 1$.

20. *Assertion (A) :* In $\triangle ABC$, D and E are the mid-points of AB and AC. If $DE = 5$ cm, then $BC = 10$ cm.

Reason (R) : A line drawn parallel to one side of a triangle intersecting the other two sides in distinct points divides those sides in the same ratio.

SECTION B

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

21. (a) Find the HCF and LCM of 17, 23 and 29.

OR

(b) Express 5005 as a product of its prime factors.

22. If $\sin A = \frac{3}{4}$, where A is acute, find $\cos A$ and $\tan A$.

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

24. Find the length of the tangent drawn to a circle of radius 7 cm from a point which is at a distance of 25 cm from its centre.

25. (a) Show that the points $A(1, 7)$, $B(4, 2)$, $C(-1, -1)$ and $D(-4, 4)$ are the vertices of a square.

OR

(b) Find the point on the y-axis which is equidistant from the points $A(-5, -2)$ and $B(3, 2)$.

SECTION C

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

26. Given that $\sqrt{3}$ is irrational, prove that $\frac{1}{2+\sqrt{3}}$ is an irrational number.

27. (a) Prove that the centre of a circle touching two intersecting lines lies on the bisector of the angle between them.

OR

(b) Two tangents PQ and PR are drawn from an external point P to a circle with centre O. Prove that $QORP$ is a cyclic quadrilateral.

28. Find the coordinates of the point which divides the line segment joining $(-3, 5)$ and $(4, -9)$ internally in the ratio $1 : 6$. Also find its distance from the origin.

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

30. (a) The daily expenditure on food of 25 households in a locality is given below. Find the mean daily expenditure on food.

Daily expenditure (in ₹)	100–150	150–200	200–250	250–300	300–350
No. of households	4	5	12	2	2

OR

(b) The ages of patients admitted to a hospital during a year are given below. Find the mode of the data.

Age (in years)	5–15	15–25	25–35	35–45	45–55	55–65
No. of patients	6	11	21	23	14	5

31. Meena went to a bank to withdraw ₹2000. She asked the cashier to give her ₹50 and ₹100 notes only. She got 25 notes in all. Find how many notes of ₹50 and ₹100 she received.

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, prove that if $ABCD$ is a trapezium with $AB \parallel DC$, and E and F are points on the non-parallel sides AD and BC such that $EF \parallel AB$, then $\frac{AE}{ED} = \frac{BF}{FC}$.

33. (a) A train travels a distance of 480 km at a uniform speed. If the speed had been 8 km/h less, it would have taken 3 hours more to cover the same distance. Find the speed of the train.

OR

(b) The sum of the ages of a boy and his brother is 25 years, and the product of their ages is 126. Find their ages.

34. A juice seller serves his customers using glasses that are cylindrical with an inner diameter of 5 cm, but the bottom of the glass has a hemispherical raised portion which reduces its capacity. The height of the glass is 10 cm. Find the apparent capacity of the glass and its actual capacity. (Use $\pi = 3.14$)

35. (a) A man in a boat rowing away from a 100 m high lighthouse takes 2 minutes to change the angle of elevation of the top of the lighthouse from 60° to 45°. Find the speed of the boat. (Use $\sqrt{3} = 1.732$)

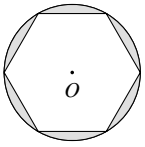
OR

(b) From two points on the same side of a 50 m high tower and in line with its foot, the angles of elevation of its top are 30° and 60°. Find the distance between the two points. (Use $\sqrt{3} = 1.732$)

SECTION E

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

36. A round table cover has six equal designs, as shown below. Each design is a segment of a circle of radius 28 cm cut off by a chord that subtends 60° at the centre. The cost of making the designs is ₹0.35 per cm^2. (Use $\sqrt{3} = 1.7$) Based on the above information, answer the following questions:



(i) Find the area of a sector of angle 60°. *1*

(ii) Find the area of the equilateral triangle formed by a chord and the two radii. *1*

(iii) (a) Find the total area of the six designs. *2*

OR

(iii) (b) Find the cost of making the six designs. *2*

37. 200 logs are stacked in a pile such that there are 20 logs in the bottom row, 19 in the next row, 18 in the row next to it, and so on. Based on the above information, answer the following questions:

(i) How many logs are there in the 5^{th} row from the bottom? *1*

(ii) Find the total number of logs in the bottom 10 rows. *1*

(iii) (a) In how many rows are the 200 logs placed? *2*

OR

(iii) (b) How many logs are there in the top row? *2*

38. A survey of 200 families having exactly two children was carried out. The data recorded is given below. A family is selected at random. Based on the above information, answer the following questions:

No. of girls in a family	2	1	0
No. of families	50	90	60

(i) Find the probability that the family has 2 girls. *1*

(ii) Find the probability that the family has no girl. *1*

(iii) (a) Find the probability that the family has at least one girl. *2*

OR

(iii) (b) Find the probability that the family has at most one girl. *2*

• • • End of Question Paper • • •

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