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/08

MATHEMATICS (BASIC)

Class X • Sample Paper 08 • 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 HCF of 135 and 225 is:

(A) 45 (B) 15 (C) 75 (D) 9

2. The number of zeroes of the polynomial $p(x) = (x-2)^2 + 4$ is:

(A) 0 (B) 1 (C) 2 (D) 3

3. The value of k for which the pair of linear equations $2x + 3y = 5$ and $4x + ky = 10$ has infinitely many solutions is:

(A) 6 (B) 3 (C) -6 (D) 9

4. The sum of two numbers is 50 and one of them is four times the other. The larger number is:

(A) 40 (B) 10 (C) 45 (D) 35

5. If $x = -\frac{1}{2}$ is a root of the quadratic equation $3x^2 + 2kx - 3 = 0$, then the value of k is:

(A) $-\frac{9}{4}$ (B) $\frac{9}{4}$ (C) $-\frac{4}{9}$ (D) $\frac{4}{9}$

6. The next term of the A.P. $\sqrt{2}, \sqrt{8}, \sqrt{18}, \ldots$ is:

(A) $\sqrt{32}$ (B) $\sqrt{24}$ (C) $\sqrt{50}$ (D) $\sqrt{28}$

7. If $2x$, $(x+10)$ and $(3x+2)$ are three consecutive terms of an A.P., then x is:

(A) 6 (B) 5 (C) 4 (D) 3

8. The x-coordinate of the point which divides the line segment joining $(-3, 4)$ and $(5, 0)$ internally in the ratio $1 : 3$ is:

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

9. A number is chosen at random from the numbers 1 to 30. The probability that it is divisible by both 3 and 5 is:

(A) $\frac{1}{15}$ (B) $\frac{1}{10}$ (C) $\frac{1}{30}$ (D) $\frac{1}{5}$

10. For the following distribution, the cumulative frequency of the class preceding the median class is:

Class	0–20	20–40	40–60	60–80	80–100
Frequency	7	10	15	8	10

(A) 17 (B) 32 (C) 15 (D) 7

11. PQ is a tangent to a circle with centre O at the point Q. If $OP = 17$ cm and $PQ = 15$ cm, then the radius of the circle is:

(A) 8 cm (B) 2 cm (C) 32 cm (D) $\sqrt{514}$ cm

12. If the median and the mean of a data are 10.5 and 9 respectively, then its mode is:

(A) 13.5 (B) 12 (C) 11 (D) 14

13. A 10 m long ladder just reaches a window. If the ladder makes an angle of 60° with the ground, the height of the window above the ground is:

(A) $5\sqrt{3}$ m (B) 5 m (C) $10\sqrt{3}$ m (D) 20 m

14. If $\sin A = \frac{1}{2}$, where A is acute, then $\cot A$ is:

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

15. In $\triangle ABC$, $\angle BAC = 90^\circ$ and $AD \perp BC$. Then $\triangle ABD$ is similar to:

(A) $\triangle CBA$ (B) $\triangle ACB$ (C) $\triangle BAC$ (D) $\triangle CAB$

16. '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.' This statement is known as:

(A) Basic Proportionality Theorem (B) Pythagoras Theorem

(C) Converse of Pythagoras Theorem (D) AA similarity criterion

17. If the angle between two tangents drawn from an external point P to a circle with centre O is 100°, then $\angle POA$, where A is a point of contact, is:

(A) 40° (B) 50° (C) 80° (D) 100°

18. The volume of a solid hemisphere of radius 3.5 cm is:

(A) 89.83 cm^3 (B) 179.67 cm^3 (C) 44.92 cm^3 (D) 269.5 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 a coin is tossed once, the probability of getting a head is $\frac{1}{2}$, so the probability of getting a tail is $\frac{1}{3}$.

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

20. *Assertion (A) :* In $\triangle PQR$, S and T are points on PQ and PR such that $ST \parallel QR$. If $PS=4$ cm, $SQ=6$ cm and $PT=6$ cm, then $TR=9$ cm.

Reason (R) : 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.

SECTION B

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

21. (a) Find the HCF and LCM of 144 and 198 by the prime factorisation method.

OR

(b) Find the greatest number which divides 285 and 1249, leaving remainders 9 and 7 respectively.

22. If $A=60^\circ$ and $B=30^\circ$, verify that $\cos(A-B)=\cos A\cos B+\sin A\sin B$.

23. If α and β are the zeroes of the polynomial $2x^2-5x+3$, find the value of $\alpha^2+\beta^2$.

24. PQ is a tangent at a point Q of a circle with centre O and radius 5 cm. If $\angle POQ=60^\circ$, find the lengths of PQ and OP.

25. (a) Using the distance formula, determine whether the points $(1,5)$, $(2,3)$ and $(-2,-11)$ are collinear.

OR

(b) If the distance of the point $(p,4)$ from the origin is 5 units, find the values of p.

SECTION C

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

26. Given that $\sqrt{5}$ is irrational, prove that $\frac{2\sqrt{5}}{3}$ is an irrational number.

27. (a) AB and CD are the two direct common tangents to two circles of unequal radii, which meet at P when produced (A, C on the smaller circle; B, D on the larger). Prove that $AB=CD$.

OR

(b) From an external point P, tangents PA and PB are drawn to a circle. A tangent at a point C on the minor arc AB meets PA at D and PB at E. If $PA=10$ cm, find the perimeter of $\triangle PDE$.

28. Find the coordinates of the point P which lies on the line segment joining $A(2,1)$ and $B(5,-8)$ such that $\frac{AP}{AB}=\frac{1}{3}$. If P lies on the line $2x-y+k=0$, find the value of k.

29. Prove that: $\cot^2 A - \cos^2 A = \cot^2 A \cos^2 A$

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

Marks	0–10	10–20	20–30	30–40	40–50
No. of students	3	8	14	9	6

OR

(b) Find the mode of the following distribution:

Class	0–10	10–20	20–30	30–40	40–50
Frequency	6	9	15	9	1

31. The ratio of the monthly incomes of two persons is $9 : 7$ and the ratio of their monthly expenditures is $4 : 3$. If each of them manages to save ₹2000 per month, find their monthly incomes.

SECTION D

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

32. State and prove the Basic Proportionality Theorem. Using its converse, check whether $DE \parallel BC$ in $\triangle ABC$, where D and E are points on AB and AC with $AB = 12$ cm, $AD = 8$ cm, $AE = 12$ cm and $AC = 18$ cm.

33. (a) The length of a rectangular hall is 5 m more than its breadth. If the area of the hall is 750 m^2, find its length and breadth.

OR

(b) The product of two consecutive positive integers is 306. Find the integers.

34. A bird-bath for a garden is in the shape of a cylinder with a hemispherical depression at one end. The height of the cylinder is 1.45 m and its radius is 30 cm. Find the total surface area of the bird-bath and the volume of water it can hold when the depression is full.

35. (a) 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 $45°$ respectively. If the bridge is at a height of 3 m from the banks, find the width of the river. (Use $\sqrt{3} = 1.732$)

OR

(b) The angle of elevation of the top of a tower from a point on the ground is $30°$. On walking 30 m towards the tower, the angle of elevation becomes $60°$. Find the height of the tower. (Use $\sqrt{3} = 1.732$)

SECTION E

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

36. A brooch is made with silver wire in the form of a circle of diameter 35 mm. The wire is also used in making 5 diameters which divide the circle into 10 equal sectors. Based on the above information, answer the following questions:

(i) Find the total length of the silver wire required. *1*

(ii) Find the area of each sector of the brooch. *1*

(iii) (a) Find the perimeter of each sector. *2*

OR

(iii) (b) Find the total area of four sectors of the brooch. *2*

37. Yasmeen saves ₹ 32 during the first month, ₹ 36 in the second month and ₹ 40 in the third month. She continues to save in this manner. Based on the above information, answer the following questions:

(i) How much does she save in the 10^{th} month? *1*

(ii) In which month does she save ₹ 100? *1*

(iii) (a) In how many months will she save ₹ 2000 in all? *2*

OR

(iii) (b) Find her total saving in the first 12 months. *2*

38. The blood groups of 30 students of a class were recorded as follows: 12 students have blood group O, 9 have A, 6 have B and 3 have AB. A student of this class is selected at random. Based on the above information, answer the following questions:

(i) Find the probability that the student has blood group O. *1*

(ii) Find the probability that the student has blood group AB. *1*

(iii) (a) Find the probability that the student does not have blood group A. *2*

OR

(iii) (b) Find the probability that the student has blood group A or B. *2*

• • • End of Question Paper • • •

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