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/06

MATHEMATICS (BASIC)

Class X • Sample Paper 06 • 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 $2^3 \times 3^2 \times 5$ and $2^2 \times 3^3 \times 7$ is:

(A) 36 (B) 72 (C) 180 (D) 12

2. The graph of $y = p(x)$ intersects the x-axis at exactly three points. The number of zeroes of $p(x)$ is:

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

3. The value of p for which the lines $2x + py = 8$ and $x + y = 6$ are parallel is:

(A) 2 (B) 1 (C) 4 (D) -2

4. Ten students of Class X took part in a quiz. If the number of girls is 4 more than the number of boys, then the number of girls is:

(A) 7 (B) 3 (C) 6 (D) 4

5. The roots of the quadratic equation $2x^2 - x - 6 = 0$ are:

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

6. Which term of the A.P. $3, 8, 13, \ldots$ is 78?

(A) 15^{th} (B) 16^{th} (C) 17^{th} (D) 18^{th}

7. The 4^{th} term of an A.P. is 14 and its 8^{th} term is 30. Its common difference is:

(A) 4 (B) 3 (C) 2 (D) 5

8. The mid-point of a line segment AB is $(2, -1)$. If A is $(-1, 3)$, then B is:

(A) $(5, -5)$ (B) $(3, -2)$ (C) $(1, 1)$ (D) $(-5, 5)$

9. A card is drawn at random from 25 cards numbered 1 to 25. The probability that the number on it is a prime number is:

(A) $\frac{9}{25}$ (B) $\frac{8}{25}$ (C) $\frac{2}{5}$ (D) $\frac{1}{5}$

10. The median class of the following distribution is:

Class	100–150	150–200	200–250	250–300	300–350
Frequency	4	5	12	2	2

(A) 150–200 (B) 200–250 (C) 250–300 (D) 100–150

11. PA and PB are tangents to a circle with centre O such that $\angle APB = 90^\circ$. If $PA = 5$ cm, then the radius of the circle is:

(A) 5 cm (B) $5\sqrt{2}$ cm (C) 10 cm (D) 2.5 cm

12. If the mean and the mode of a data are 40 and 37 respectively, then its median is:

(A) 39 (B) 38 (C) 41 (D) 38.5

13. If the height of a tower and the distance of a point on the ground from its foot are equal, then the angle of elevation of the top of the tower from that point is:

(A) 30° (B) 45° (C) 60° (D) 90°

14. The value of $\sin^2 60^\circ + 2\tan 45^\circ - \cos^2 30^\circ$ is:

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

15. If $\triangle ABC \sim \triangle PQR$ with $\angle A = 50^\circ$ and $\angle B = 60^\circ$, then $\angle R$ is:

(A) 70° (B) 60° (C) 50° (D) 80°

16. The corresponding sides of two similar triangles are in the ratio 4 : 9. The ratio of their perimeters is:

(A) 4 : 9 (B) 16 : 81 (C) 2 : 3 (D) 9 : 4

17. The maximum number of tangents that can be drawn to a circle parallel to a given line is:

(A) 1 (B) 2

(C) 3 (D) infinitely many

18. The curved surface area of a right circular cylinder of base radius 7 cm and height 10 cm is:

(A) 440 cm^2 (B) 220 cm^2 (C) 1540 cm^2 (D) 748 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) :* In a single throw of a die, the probability of getting the number 7 is 0.
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 $AD = DB$, then $AE = EC$.
Reason (R) : The line segment joining the mid-points of any two sides of a triangle 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 72 and 120, and verify that HCF $\times$ LCM = product of the two numbers.

OR

(b) Three tankers contain 403 litres, 434 litres and 465 litres of diesel respectively. Find the maximum capacity of a container that can measure the diesel of the three tankers an exact number of times.

22. If $2\cos 3\theta = 1$ and 3θ is an acute angle, find θ and hence the value of $\sin(\theta + 10^\circ)$.

23. Find the zeroes of the quadratic polynomial $3x^2 + 5x - 2$ and verify the relationship between the zeroes and the coefficients.

24. From an external point B of a circle with centre O, two tangents BC and BD are drawn such that $\angle DBC = 120^\circ$. Prove that $BC + BD = BO$.

25. (a) Find the distance between the points $P(-6, 7)$ and $Q(-1, -5)$.

OR

(b) Find the mid-point of the line segment joining $(3, -4)$ and $(-7, 10)$, and its distance from the origin.

SECTION C

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

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

27. (a) A circle is inscribed in $\triangle ABC$, right-angled at B, with $AB = 6$ cm and $BC = 8$ cm. Find the radius of the circle.

OR

(b) TP and TQ are tangents drawn from an external point T to a circle with centre O. If $\angle POQ = 110^\circ$, find $\angle PTQ$ and $\angle TPQ$.

28. Find the coordinates of the point Q on the x-axis which lies on the perpendicular bisector of the line segment joining the points $A(-5, -2)$ and $B(4, -2)$. Name the type of triangle formed by the points Q, A and B.

29. Prove that: $(1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A) = 2$

30. (a) Find the mean age of the members of a club from the following data:

Age (in years)	20–30	30–40	40–50	50–60	60–70
No. of members	3	7	12	5	3

OR

(b) Find the mode of the following distribution:

Class	0–10	10–20	20–30	30–40	40–50	50–60	60–70
Frequency	5	8	7	12	28	20	10

31. Five years ago, Arun was three times as old as his son Varun. Ten years later, Arun will be twice as old as Varun. Find their present ages.

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 x if in $\triangle PQR$, $ST \parallel QR$ with S on PQ and T on PR, $PS = x$ cm, $SQ = 6$ cm, $PT = 8$ cm and $TR = (x+8)$ cm.

33. (a) A shopkeeper buys some books for ₹ 80. If he had bought 4 more books for the same amount, each book would have cost ₹ 1 less. Find the number of books he bought.

OR

(b) The sum of the areas of two squares is 244 m^2. If the difference of their perimeters is 8 m, find the sides of the two squares.

34. An ice-cream cone is in the shape of a right circular cone of radius 3.5 cm and height 12 cm, completely filled with ice-cream and having a hemispherical top of ice-cream. Find the volume of the ice-cream and the area of its outer surface.

35. (a) Two ships are on either side of a lighthouse 100 m high, in the same straight line with its foot. The angles of depression of the two ships from the top of the lighthouse are 30° and 45°. Find the distance between the two ships. (Use $\sqrt{3} = 1.732$)

OR

(b) A vertical tower stands on a horizontal plane and is surmounted by a vertical flagstaff 6 m long. At a point on the plane, the angles of elevation of the bottom and the top of the flagstaff are 30° and 45° respectively. 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. The bob of a pendulum, 35 cm long, swings through an angle of 72° from one extreme position to the other. Based on the above information, answer the following questions:

(i) Find the length of the arc traced by the bob in one swing. *1*

(ii) Find the area of the sector swept by the pendulum in one swing. *1*

(iii) (a) If in another swing the bob traces an arc of length 33 cm, find the angle of the swing. *2*

OR

(iii) (b) Find the total area swept by the pendulum in 5 swings of 72° each. *2*

37. Kiran decides to read a novel. She reads 15 pages on the first day and every day she reads 5 pages more than the previous day. Based on the above information, answer the following questions:

(i) How many pages does she read on the 8^{th} day? *1*

(ii) On which day does she read 75 pages? *1*

(iii) (a) Find the total number of pages she reads in the first 10 days. *2*

OR

(iii) (b) If the novel has 510 pages, in how many days will she finish it? *2*

38. In a fun-fair game, a spinner with 8 equal sectors numbered 1 to 8 is spun. A player wins a prize depending on the number at which the arrow stops (the arrow never stops on a boundary). Based on the above information, answer the following questions:

(i) Find the probability that the arrow stops at 8. *1*

(ii) Find the probability that the arrow stops at a multiple of 3. *1*

(iii) (a) Find the probability that the arrow stops at a number greater than 2. *2*

OR

(iii) (b) Find the probability that the arrow stops at a prime number. *2*

• • • End of Question Paper • • •

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