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/11

MATHEMATICS (BASIC)

Class X • Sample Paper 11 • 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 product of the HCF and the LCM of 24 and 36 is:

(A) 864 (B) 72 (C) 12 (D) 432

2. A quadratic polynomial whose zeroes are 0 and 5 is:

(A) $x^2 - 5x$ (B) $x^2 + 5x$ (C) $x^2 - 5$ (D) $5x$

3. If $x = a$, $y = b$ is the solution of the equations $x - y = 2$ and $x + y = 4$, then the values of a and b are respectively:

(A) 3, 1 (B) 1, 3 (C) 2, 2 (D) 4, 0

4. Of two supplementary angles, the larger exceeds the smaller by 18°. The smaller angle is:

(A) 81° (B) 99° (C) 72° (D) 108°

5. The number of real roots of the equation $(x+1)^2 - x^2 = 0$ is:

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

6. If $a_{21} - a_7 = 84$ for an A.P., then its common difference is:

(A) 6 (B) 7 (C) 12 (D) 4

7. The sum of the first 16 terms of the A.P. $10, 6, 2, \ldots$ is:

(A) -320 (B) 320 (C) -352 (D) -400

8. The coordinates of the point which divides the line segment joining $(0, 0)$ and $(9, 12)$ internally in the ratio $1 : 2$ are:

(A) $(3, 4)$ (B) $(6, 8)$ (C) $(4, 3)$ (D) $(4.5, 6)$

9. A bag contains 3 red, 2 blue and 5 green balls. A ball is drawn at random. The probability that it is not red is:

(A) $\frac{7}{10}$ (B) $\frac{3}{10}$ (C) $\frac{1}{2}$ (D) $\frac{1}{5}$

10. The upper limit of the modal class of the following distribution is:

Class	0–10	10–20	20–30	30–40	40–50
Frequency	4	7	13	9	2

(A) 30 (B) 20 (C) 40 (D) 25

11. Tangents PA and PB drawn from an external point P to a circle of radius 4 cm with centre O are perpendicular to each other. The length of OP is:

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

12. If the mean and the median of a distribution are 24 and 26 respectively, then its mode is:

(A) 30 (B) 28 (C) 25 (D) 22

13. A ramp for wheelchair users is inclined at 30° to the ground and rises to a height of 1 m. The length of the ramp is:

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

14. If $\tan\theta = 1$, where θ is acute, then $\sin\theta + \cos\theta$ is:

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

15. If $\triangle PQR \sim \triangle XYZ$ with $PQ = 4$ cm, $XY = 6$ cm and $YZ = 9$ cm, then QR is:

(A) 6 cm (B) 13.5 cm (C) 4 cm (D) 8 cm

16. D and E are points on the sides AB and AC of $\triangle ABC$ such that $\frac{AD}{DB} = \frac{AE}{EC}$. Then:

(A) $DE \parallel BC$ (B) $DE \perp BC$

(C) $DE = BC$ (D) $DE = \frac{1}{2}BC$ always

17. A line which intersects a circle in two distinct points is called a:

(A) secant (B) tangent

(C) radius (D) point of contact

18. The volume of a right circular cylinder of base radius 3.5 cm and height 4 cm is:

(A) 154 cm^3 (B) 77 cm^3 (C) 308 cm^3 (D) 44 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) :* A box contains 4 red and 6 black balls. The probability of drawing a black ball from it is $\frac{3}{5}$.

Reason (R) : Probability of an event $= \frac{\text{number of outcomes favourable to it}}{\text{total number of possible outcomes}}$.

20. *Assertion (A) :* In $\triangle ABC$, $DE \parallel BC$ with D on AB and E on AC. Then $\frac{AD}{AB} = \frac{AE}{AC}$.

Reason (R) : In $\triangle ABC$, if $DE \parallel BC$, then $\frac{AD}{DB} = \frac{DE}{BC}$.

SECTION B

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

21. (a) Find the HCF and LCM of 120 and 75 by the prime factorisation method.

OR

(b) Find the LCM of 15, 25 and 35.

22. Show that $2(\cos^4 60° + \sin^4 30°) - (\tan^2 60° + \cot^2 45°) + 3\sec^2 30° = \frac{1}{4}$.

23. If α and β are the zeroes of the polynomial $x^2 - x - 6$, find the value of $\alpha^2\beta + \alpha\beta^2$.

24. Prove that the tangents drawn from an external point P to a circle with centre O are equally inclined to the line OP.

25. (a) Find the values of x if the distance between the points $(x, -1)$ and $(3, 2)$ is 5 units.

OR

(b) Show that the points $A(3, 0)$, $B(6, 4)$ and $C(-1, 3)$ are the vertices of an isosceles right triangle.

SECTION C

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

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

27. (a) AB is a chord of a circle with centre O, AOC is a diameter and AT is the tangent at A. Prove that $\angle BAT = \angle ACB$.

OR

(b) The angle between two radii OA and OB of a circle is $130°$. Find the angle between the tangents drawn at A and B, giving reasons.

28. Find the ratio in which the point $P(m, 6)$ divides the line segment joining $A(-4, 3)$ and $B(2, 8)$. Also find the value of m.

29. Prove that: $\frac{1}{\text{cosec}A - \cot A} - \frac{1}{\sin A} = \frac{1}{\sin A} - \frac{1}{\text{cosec}A + \cot A}$

30. (a) Find the mean number of wickets taken by bowlers from the following data:

No. of wickets	20–60	60–100	100–150	150–250	250–350	350–450
No. of bowlers	7	5	16	12	2	3

OR

(b) Find the mode of the following data of runs scored by batsmen:

Runs	3000–4000	4000–5000	5000–6000	6000–7000	7000–8000	8000–9000
No. of batsmen	4	18	9	7	6	3

31. Amit and Bina have some money. If Amit gives ₹ 100 to Bina, Bina will have twice the amount left with Amit. If Bina gives ₹ 10 to Amit, Amit will have six times the amount left with Bina. How much money does each have?

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 the following: In $\triangle ABC$, AD is a median and E is the mid-point of AD. BE produced meets AC at F. Show that $AF = \frac{1}{3}AC$.

33. (a) In a class test, the sum of Shefali's marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of her marks would have been 210. Find her marks in the two subjects.

OR

(b) The area of a right triangle is 600 cm^2. If its base exceeds its altitude by 10 cm, find the lengths of its three sides.

34. A decorative block is made of two solids, a cube and a hemisphere. The base of the block is a cube with edge 5 cm and the hemisphere fixed on the top has a diameter of 4.2 cm. Find the total surface area and the volume of the block.

35. (a) The angle of elevation of the top of a chimney from the foot of a tower is 60° and the angle of depression of the foot of the chimney from the top of the tower is 30°. If the height of the tower is 40 m, find the height of the chimney.

OR

(b) From the top of a 15 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 30°. Find the height of the tower.

SECTION E

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

36. A protractor is in the shape of a semicircle of radius 7 cm. Based on the above information, answer the following questions:

(i) Find the perimeter of the protractor. *1*

(ii) Find the area of the protractor. *1*

(iii) (a) Find the area of the sector between the 0° and 60° marks of the protractor. *2*

OR

(iii) (b) Find the length of the arc between the 30° and 120° marks. *2*

37. In a school, students decided to plant trees in and around the school to reduce air pollution. Each section of each class will plant as many trees as the class number; for example, a section of Class I plants 1 tree, a section of Class II plants 2 trees, and so on till Class XII. There are three sections of each class. Based on the above information, answer the following questions:

(i) How many trees will be planted by the three sections of Class V? *1*

(ii) How many trees will be planted by the three sections of Class XII? *1*

(iii) (a) Find the total number of trees planted by the students. *2*

OR

(iii) (b) Find the number of trees planted by Classes VI to X together. *2*

38. A lot of 144 ball pens contains 20 defective pens; the others are good. Nuri will buy a pen if it is good, but will not buy it if it is defective. The shopkeeper draws one pen at random and gives it to her. Based on the above information, answer the following questions:

(i) Find the probability that she will buy it. *1*

(ii) Find the probability that she will not buy it. *1*

(iii) (a) If 16 more good pens are added to the lot, find the probability that the pen drawn is defective. *2*

OR

(iii) (b) If 4 of the defective pens are replaced by good pens, find the probability that she will buy the pen drawn. *2*

• • • End of Question Paper • • •

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