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/12

MATHEMATICS (BASIC)

Class X • Sample Paper 12 • 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. Given that HCF$(26, 169) = 13$, the LCM of 26 and 169 is:

(A) 338 (B) 13 (C) 2197 (D) 26

2. If the product of the zeroes of the polynomial $ax^2 - 6x - 6$ is 4, then the value of a is:

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

3. The pair of linear equations $kx + 2y = 5$ and $3x + y = 1$ has a unique solution if:

(A) $k \neq 6$ (B) $k = 6$ (C) $k \neq 3$ (D) $k = 3$

4. One number is 3 more than twice another number. If their sum is 18, the larger number is:

(A) 13 (B) 5 (C) 11 (D) 15

5. If $x = 3$ is a root of the quadratic equation $x^2 - 2kx - 6 = 0$, then the value of k is:

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

6. The 30^{th} term of the A.P. $10, 7, 4, \ldots$ is:

(A) -77 (B) 77 (C) -87 (D) 97

7. The sum of the first 8 terms of the A.P. $1, 4, 7, \ldots$ is:

(A) 92 (B) 100 (C) 84 (D) 96

8. If $P(-1, 1)$ is the mid-point of the line segment joining $A(-3, b)$ and $B(1, b+4)$, then b is:

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

9. Two coins are tossed together. The probability of getting at most one head is:

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

10. For a frequency distribution, if $\Sigma f_i = 20$ and $\Sigma f_i x_i = 320$, then the mean is:

(A) 16 (B) 20 (C) 32 (D) 6.4

11. The length of the tangent drawn from a point 10 cm away from the centre of a circle of radius 6 cm is:

(A) 8 cm (B) 4 cm (C) 16 cm (D) $\sqrt{136}$ cm

12. If the median and the mean of a data are 15 and 16 respectively, then its mode is:

(A) 13 (B) 14 (C) 17 (D) 12

13. The angle of depression of a point on the ground from the top of a 25 m high tower is 60°. The distance of the point from the foot of the tower is:

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

14. The value of $(1+\tan^2\theta)(1-\sin\theta)(1+\sin\theta)$ is:

(A) 1 (B) 0 (C) 2 (D) $\sin^2\theta$

15. In $\triangle ABC$, $DE \parallel BC$ with D on AB and E on AC. Then $\triangle ADE \sim \triangle ABC$ by the criterion:

(A) AA (B) SAS (C) SSS (D) RHS

16. $\triangle ABC \sim \triangle PQR$ with $AB = 8$ cm and $PQ = 12$ cm. The ratio of their corresponding altitudes is:

(A) $2:3$ (B) $4:9$ (C) $3:2$ (D) $9:4$

17. PA and PB are tangents drawn from an external point P to a circle. If $PA = 8$ cm, then PB is:

(A) 8 cm (B) 4 cm

(C) 16 cm (D) cannot be determined

18. The total surface area of a solid cylinder of base radius 7 cm and height 3 cm is:

(A) 440 cm^2 (B) 132 cm^2 (C) 308 cm^2 (D) 572 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) :* When a die is thrown once, the probability of getting a prime number is equal to the probability of getting a composite number.

Reason (R) : 1 is neither a prime number nor a composite number.

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

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 132 and 180 by the prime factorisation method.

OR

(b) Find the greatest 6-digit number which is exactly divisible by 24, 15 and 36.

22. If $\cot\theta = \frac{15}{8}$, evaluate $\frac{(2+2\sin\theta)(1-\sin\theta)}{(1+\cos\theta)(2-2\cos\theta)}$.

23. Find the zeroes of the quadratic polynomial $4s^2 - 4s + 1$ and verify the relationship between the zeroes and the coefficients.

24. A circle touches the side BC of $\triangle ABC$ at P and the sides AB and AC produced at Q and R respectively. If $AQ = 10$ cm, find the perimeter of $\triangle ABC$.

25. (a) Find the points on the y-axis which are at a distance of 10 units from the point $(8, 3)$.

OR

(b) If $A(5, 2)$, $B(2, -2)$ and $C(-2, t)$ are the vertices of a triangle right-angled at B, find the value of t.

SECTION C

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

26. Given that $\sqrt{5}$ is irrational, prove that $7 + 2\sqrt{5}$ is an irrational number.

27. (a) Two circles touch each other externally at P. AB is a common tangent to the circles touching them at A and B. The common tangent at P meets AB at Q. Prove that $\angle APB = 90°$.

OR

(b) From a point P, two tangents PA and PB are drawn to a circle with centre O. If OP is equal to the diameter of the circle, show that $\triangle APB$ is equilateral.

28. Determine the ratio in which the line $2x + y - 4 = 0$ divides the line segment joining the points $A(2, -2)$ and $B(3, 7)$.

29. Prove that: $\sec^4\theta - \sec^2\theta = \tan^4\theta + \tan^2\theta$

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

Class	50–60	60–70	70–80	80–90	90–100
Frequency	8	6	12	11	13

OR

(b) Find the mode of the following distribution:

Class	15–20	20–25	25–30	30–35	35–40	40–45	45–50
Frequency	3	8	9	10	3	0	2

31. A train covered a certain distance at a uniform speed. If the train had been 10 km/h faster, it would have taken 2 hours less than the scheduled time; and if it had been 10 km/h slower, it would have taken 3 hours more. Find the distance covered by the train.

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 $\triangle ABC$, $DE \parallel BC$ with D on AB and E on AC. If $AD = 2$ cm, $DB = 4$ cm, $AE = 3$ cm and $DE = 2.5$ cm, find EC and BC.

33. (a) Is it possible to design a rectangular park of perimeter 80 m and area 400 m^2? If so, find its length and breadth.

OR

(b) The sum of two natural numbers is 27 and their product is 182. Find the numbers.

34. A spherical glass vessel has a cylindrical neck 8 cm long and 2 cm in diameter. The diameter of the spherical part is 8.5 cm. Find the quantity of water the vessel can hold. (Use $\pi = 3.14$)

35. (a) From the top of a hill, the angles of depression of two consecutive kilometre stones due east are 30° and 45°. Find the height of the hill. (Use $\sqrt{3} = 1.732$)

OR

(b) The angles of elevation of the top of a tower from the top and the foot of a 10 m high building are 30° and 60° respectively. Find the height of the tower.

SECTION E

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

36. A circular park of radius 35 m has a uniform path of width 7 m all around it on the outside. Based on the above information, answer the following questions:

(i) Find the area of the park. *1*

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

(iii) (a) Find the cost of paving the path at ₹ 10 per m^2. *2*

OR

(iii) (b) Find the length of fencing required along the outer boundary of the path, and its cost at ₹ 15 per metre. *2*

37. Dhruv starts a fitness routine. He does 10 push-ups on the first day and increases the number by 2 every day. Based on the above information, answer the following questions:

(i) How many push-ups does he do on the 15^{th} day? *1*

(ii) On which day does he do 50 push-ups? *1*

(iii) (a) Find the total number of push-ups he does in the first 20 days. *2*

OR

(iii) (b) In how many days will the total number of push-ups done be 400? *2*

38. A carton consists of 100 shirts, of which 88 are good, 8 have minor defects and 4 have major defects. Jimmy, a trader, will accept only the good shirts, but Sujatha, another trader, will accept only the shirts which have no major defect. One shirt is drawn at random from the carton. Based on the above information, answer the following questions:

(i) Find the probability that it is acceptable to Jimmy. *1*

(ii) Find the probability that it is acceptable to Sujatha. *1*

(iii) (a) Find the probability that the shirt drawn has some defect. *2*

OR

(iii) (b) Find the probability that the shirt is acceptable to Sujatha but not to Jimmy. *2*

• • • End of Question Paper • • •

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