Sample Question Paper

(SSLC Examination 2024-25)

Mathematics

(New Course – NCERT Textbook)

by

Meghalaya Board of School Education (MBOSE)

A. The Scheme of Examination

	Maximum Marks	Pass Marks
Theory Examination	80	24
Internal Assessment	20	6
Total	100	30

B. Scheme of Theory Examination

Section	Type of Questions	Marks for Each Question	No. of questions to be attempted/ no. of questions given	Total Marks
Section-A	MCQs	1	30/30	1x30=30
Section-B	Very Short Answer Questions	2	6/9	2x6=12
Section-C	Short Answer Questions	3	6/9	3x6=18
Section-D	Long Answer Questions	5	4/7	5x4=20
Total Marks				**80**

C. Scheme of Internal Assessment

The Internal Assessment can be done through anyone of the following:

1. Project Work
2. Written Tests
3. Assignments (Class work or Home Work)

D. Content Weightage in Theory Examination

The chapter-wise weightage shown below is only indicative for the purpose of information of teachers while prioritising different chapters during teaching or assessment. Though the weightage in Theory Examination conducted by MBOSE would broadly follow the following pattern, there may still be some variation.

Subject	**Chapter**	**Marks**
Algebra	• Real Numbers • Polynomials • Pairs of Linear Equations in Two Variables • Quadratic Equations • Arithmetic Progression	27
Coordinate Geometry	• Coordinate Geometry	05
Trigonometry	• Introduction to Trigonometry • Some Applications of Trigonometry	09
Geometry and Mensuration	• Triangles • Circles • Arrears related to Circles • Surface Areas and Volumes	29
Statistics & Probability	• Statistics • Probability	10
Total		80

Sample Question Paper

Mathematics
Class-X

Question Paper Code: XY

Time: 3 hours **Max Marks: 80 (Pass Marks: 24)**

General Instructions:

1. Please check that this Question Paper contains 55 Questions.
2. Question Paper Code given above should be written on the Answer Book, in the space provided, by the Candidate.
3. 15 minutes time is given for the candidates to read the Question paper. The Question Paper will be distributed 15 minutes before the scheduled time of the examination. In these 15 minutes, the candidates should only read the instructions and questions carefully and should not write answers on the Answer Sheet.
4. The Question Paper contains 4 sections, Section A, B, C and D.
5. Section-A contains Multiple Choice Questions (MCQ). Choose the most appropriate answer from the given options. The answers to this Section must be provided in the boxes provided in the Answer Sheet. Answers provided anywhere else will not be counted for marking.
6. Section-B contains Very Short Answer Questions. Answer the questions briefly, in minimum 3 steps.
7. Section-C contains Short Answer Questions. Answer the questions in minimum 5 steps.
8. Section-D contains Long Answer Questions. Answer the questions in minimum 8 steps.
9. Use of calculators/ mobile phone/ any electronic device is NOT ALLOWED.

Section- A

Multiple Choice Questions: Attempt **ALL** Questions. (30 X 1 = 30 marks)

1. The product of a non-zero rational number and an irrational number is :

(A) An irrational number (B) a rational number (C) one (D) zero

2. If the product of two numbers is 540 and their LCM is 30, then their HCF is:

(A) 15 (B) 16 (C) 18 (D) 24

3. Which of the following is a quadratic polynomial?

(A) $x + 7$ (B) $x^2 - 2$ (C) $x^3 + 4x + 9$ (D) $x^4 + 3x^3 + 2x + 7$

4. A polynomial of degree 3 is called a:

(A) Linear polynomial (B) quadratic polynomial

(C) cubic polynomial (D) biquadratic polynomial

5. The pair of equations x = a and y = b graphically represents lines which are:

(A) parallel (B) coincident (C) intersecting at (a, b) (D) intersecting at (b, a)

6. The system of equations $-3x + 4y = 5$ and $\frac{9}{2}x - 6y + \frac{15}{2} = 0$ has :

(A) Unique solution (B) infinite many solutions (C) no solutions (D) none of these

7. The sum of the roots of the equation $x^2 - 6x + 5 = 0$ is:

(A) 5 (B) - 5 (C) 6 (D) -6

8. The product of the roots of the equation $x^2 - 6x + 5 = 0$ is:

(A) 5 (B) - 5 (C) 6 (D) -6

9. The 9^{th} term of an AP: 3, 8, 13, 18, …..... is:

(A) 43 (B) 23 (C) 93 (D) 113

10. The first three terms of an AP when the first term, a= 4 and common difference, d = 6 are:

(A) 4, - 2, - 8 (B) 4, 10, 16 (C) 10, 16, 22 (D) -10, -16, -22

11. All geometrical congruent figures are:
(A) Not similar (B) similar (C) unequal (D) none of the above

12. The ratio of any two corresponding sides in two equiangular triangles is always:
(A) Complementary (B) different (C) equal (D) none of the above

13. If two angles of one triangle are respectively equal to two angles of another triangle then the two Triangles are similar. This is referred to as the:
(A) AA Similarity Criterion for two triangles
(B) SAS Similarity Criterion for two triangles
(C) AAA Similarity Criterion for two triangles
(D) SSS Similarity Criterion for two triangles

14. The distance of a point P (3, 4) from origin is:
(A) 1 unit (B) 3 units (C) 5 units (D) 7 units

15. The midpoint of the line segment joining the points A (- 2, 8) and B (- 6, - 4) is:
(A) (4, 2) (B) (- 4, 2) (C) (4, - 2) (D) (- 4, - 2)

16. The value of $1 + \tan^2 45^0$ is:
(A) 0 (B) – 1 (C) 1 (D) 2

17. If $\cos \theta = 1$ then the value of θ is:
(A) 0^0 (B) 30^0 (C) 60^0 (D) 90^0

18. How many tangents can be drawn parallel to the secant of a circle?
(A) One (B) two (C) three (D) infinitely many

19. If a tangent PQ at a point P of a circle of radius 5cm meets a line through the Centre O such that OQ = 12 cm then the length PQ is :
(A) 12cm (B) 13 cm (c) 8.5cm (D) $\sqrt{119}$ cm

20. If a tangent PA and PB from a point P to a circle with Centre O are inclined to each other at an angle of 80^0, then <POA is equal to:

(A) 50^0 (B) 60^0 (C) 70^0 (D) 80^0

21. The angle made by the minute hand of a clock at its Centre in 15 minutes duration is:

(A) 60^0 (B) 80^0 (C) 90^0 (D) 180^0

22. If the circumference of a circle increases from $2\prod$ to $4\prod$ then its area is:

(A) four times (B) tripled (C) doubled (D) halved

23. The total surface area of a hemisphere of radius R units is:

(A) πR^2 sq. units (B) $2\pi R^2$ sq. units (C) $3\pi R^2$ sq. units (D) $4\pi R^2$ sq. units

24. During conversion of a solid from one shape to another, the volume of the new shape will:

(A) Increase (B) decreases (C) remain unaltered (D) be doubled

25. If the surface area of a sphere is 616 cm^2 its diameter is:

(A) 7 cm (B) 14 cm (C) 28 cm (D) 56 cm

26. The middle most observation of every data arranged in order is called:

(A) Median (B) mode (C) mean (D) deviation

27. A numerical data is sad to be multimodal if it has:

(A) Single mode (B) two modes (C) three modes (D) more than three modes

28. Which of the following cannot be the probability of an event?

(A) 2/3 (B) – 1.5 (C) 15 % (D) 0.7

29. A Child has a die whose six faces marked with letters A, B, C, D, E, A. When the die is thrown once then the probability of getting A is:

(A) 2 (B) 1/6 (C) 1/3 (D) 2/3

30. The probability that it will rain today is 0.87, then the probability that it will not rain today is:

(A) 0.13 (B) 1.87 (C) 87/100 (D) 1.03

Section – B

Very Short Answer Questions: Answer **any 6 (six)**. (2x6=12 marks)

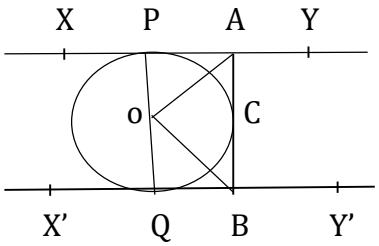
31. Express 5005 as a product of its prime factors.
32. Solve the following system of linear equations: 2x + 3y =5 and 3x – 4y = - 1
33. Find the length and breadth of a rectangular mango grove whose length is twice its breadth and its area is 800 m^2?
34. Prove that $\frac{\sin\theta - 2\,sin^3\,\theta}{2cos^3\theta - \cos\theta} = \tan\theta$
35. If cot θ = 7/8, evaluate $\frac{(1+sin\theta)(1-sin\theta)}{(1+cos\theta)(1-cos\theta)}$
36. D is a point on the side BC of a triangle ABC such that <ADC = <BAC. Show that CA^2 = CB. CD.
37. 12 defective pens are accidentally mixed with 132 good ones. It is not possible to just look at a pen and tell whether or not is defective. One pen is taken out at random from this lot. Determine the probability that the pen taken out is a good one.
38. Prove that 3 + 2√5 is an irrational number. It is given that √5 is an irrational number.
39. Show that the number 7 x 11 x 13 + 13 is a composite number.

Section – C

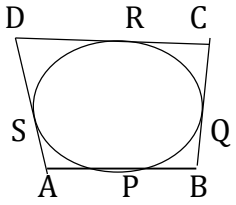
Short Answer Questions: Answer **any 6 (six)**. **(**3x6=18 marks)

40. Find the ratio in which the line segment joining the points A (1, -5) and B (- 4, 5) is divided by the x- axis.
41. Find the coordinates of a point A, where AB is the diameter of a circle whose Centre is (2, - 3) and B is (1, 4).
42. Rohan's mother is 26 years older than him. The product of their ages 3 years from now will be 360 years. Find their present ages?
43. In the given figure, XY and X'Y' are two parallel tangents to a circle with Centre O and another tangent AB with point of contact C intersecting XY at A and X'Y' at B. Prove that

<AOB = 90^0.



44. A Quadrilateral ABCD is drawn to circumscribe a circle as shown in the adjoining figure. Prove that AB + CD = AD + BC



45. In a circle of radius 21 cm, an arc subtends an angle of 60^0 at the Centre. Find:

(i) The length of the arc; and

(ii) area of the sector formed by the arc. (use π = 22/7)

46. The following table shows the ages of the patients admitted in a hospital during the year. Based on the information, find median of the given data.

Ages (in years)	5-15	15-25	25-35	35-45	45-55	55-65
Number of patients	6	11	21	23	14	5

47. Based on the information given in Question no. 46, find mean of the given data.

48. If α and β are zeroes of the polynomial $P(x) = 3x^2 - 2x - 6$, then find the value of $\left(\frac{1}{\alpha}+\frac{1}{\beta}\right)$

Section – D

Long Answer Questions: Answer **any 4 (four)** (4x5=20 marks)

49. A Tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the Cylindrical part are 2. 1 m and 4 m respectively; and the slant height of the top is 2.8 m. Find the area of the canvas used for making the tent. Also, find the cost of the canvas of the tent at the rate of ₹500 per meter. (Use π = 22/7)

50. If $\boldsymbol{\alpha}$ and $\boldsymbol{\beta}$ are zeroes of the polynomial $\boldsymbol{p(x) = ax^2 + bx + c}$, then evaluate$\boldsymbol{(\alpha - \beta)^2}$.
51. If the 5th and 12th term of an AP are 30 and 65 respectively, then find the sum of its first 20 terms?
52. If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, and then prove that the other two sides are divided in the same ratio.
53. In the give figure PA, QB ad RC are each perpendicular to AC, such that PA =x, QB = z, RC = y, AB= a, and BC = b. prove that $1/x + 1/y = 1/z$.
54. A TV tower stands vertically on a bank of a canal. From a point on the other bank directly opposite the tower, the angle of elevation of the top of the tower is 60^0. From another point 20 m away from this point on the line joining this point to the foot of the tower, the angle of elevation of the top of the tower is 30^0. Find the height of the tower and the width of the canal?
55. The mileage (Km per litre) of 50 cars of the same model was tested by a manufacturer and details are tabulated as given below:

Mileage(Km per litre)	**10 − 12**	**12 − 14**	**14 − 16**	**16 − 18**
Number of cars	**7**	**12**	**18**	**13**

Find the mean mileage.

*** End of the Question Paper ***