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FOR GOA CLASS 12 PREPARATION

Goa Board Class 12 Sample Paper 2027 Mathematics (Voc)

EXAM	YEAR	TYPE	SUBJECT
Goa Class 12	2027	Sample Paper	Maths

GOA BOARD OF SECONDARY & HIGHER SECONDARY EDUCATION

ALTO – BETIM, GOA

PROFORMA FOR ANALYSIS OF QUESTION PAPER 2026 onwards

Subject: Mathematics (Voc.) **Year of Examination: April 2026 onwards**
Duration: 2 hrs **Class: XII Computer Technique** **Marks Allotted: 50**

1. Sections if any: - YES – Section A, B, C and D.

2. Total No. of questions and marks: -

No. of questions set in the paper	No. of questions to be attempted	Total marks for all the questions set in the paper	Maximum marks for attempted questions
25	25	50	50

3. Study of options:

(a) Overall options in the whole question paper:- -NO-
(b) Overall options within the sections: - -NO-
(c) Overall options within a question: - -NO-
(d) Internal option within the question: - -NO-
(e) Comparability options: --NO-

4. Instructions for examiners: - Evaluate as per pattern

5. Directions in individual question: - -NIL

6. Allocation of marks question-wise and part-wise: -

Section A: Q.Nos. 01 to 10 – 1 mark each
Section B: Q.Nos. 11 to 18 – 2 marks each
Section C: Q.Nos. 19 to 22 – 3 marks each
Section D: Q.Nos. 23 to 25 – 4 marks each

7. General format

(a) Arrangement of question, numbering and printing etc.

Section A	Section B	Section C	Section D
1	11	19	23
2	12	20	24
3	13	21	25
4	14	22	
5	15		
6	16		
7	17		
8	18		
9			
10			

8. Question-wise Analysis

Sr. no. Part no.	Objective	Content Area Major area of content topic	Form of the questions	Language of Questions	Definiteness of the answers	Difficulty level of the questions	Marks allotted	Time in min.
1	K	Matrices	M.C.Q.	ENGLISH	Definite	Easy	1	3
2	U	Matrices	M.C.Q.		Definite	Easy	1	3
3	A	Matrices	M.C.Q.		Definite	Average	1	3
4	A	Matrices	M.C.Q.		Definite	Average	1	3
5	A	Matrices	M.C.Q.		Definite	Easy	1	3
6	U	Derivative	VSA		Definite	Easy	1	3
7	U	Derivative	VSA		Definite	Easy	1	3
8	K	Integration	VSA		Definite	Easy	1	3
9	K	Integration	VSA		Definite	Easy	1	3
10	K	Definite Integrals	VSA		Definite	Easy	1	3
11	U	Numerical Methods	SA1		Definite	Easy	2	4
12	K	Probability	SA1		Definite	Easy	2	4
13	U	Probability	SA1		Definite	Average	2	4
14	U	Derivative	SA1		Definite	Difficult	2	4
15	U	Derivative	SA1		Definite	Average	2	4
16	U	Derivative	SA1		Definite	Average	2	4
17	U	Integration	SA1		Definite	Average	2	4
18	A	Definite Integrals	SA1		Definite	Average	2	4
19	U	Continuity	SA2		Definite	Difficult	3	7
20	A	Matrices	SA2		Definite	Average	3	7
21	U	Integration	SA2		Definite	Difficult	3	7
22	A	Definite Integrals	SA2		Definite	Average	3	7
23	A	Numerical Methods	LA		Definite	Average	4	10
24	A	Correlation & Regression	LA		Definite	Average	4	10
25	S	L.P.P	LA		Definite	Average	4	10

A) Weightage to Learning Outcomes

Sr. No.	Learning Outcomes	Marks	Percentage of Marks
1.	Knowledge	6	12%
2.	Understanding	18	36%
3.	Application	22	44%
4.	Skill	4	8%

B) Weightage to Content/Subject Units

Sr. No.	Units	Question For marks	Marks	Percentage
1.	Numerical Methods	2+4	6	12%
2.	Correlation & Regression	4	4	8%
3.	Matrices	1+1+1+1+1+3	8	16%
4.	Probability	2+2	4	8%
5.	Continuity	3	3	6%
6.	Derivatives	1+1+2+2+2	8	16%
7.	Integration	1+1+2+3	7	14%
8.	Definite Integrals & Application	1+2+3	6	12%
9.	Linear Programming	4	4	8%
	Total		50	100%

C) Coverage of topics

No. of topics in the syllabus	Topics covered	Percentage
9	9	100%

D) Weightage to form of questions

Sr. No.	Form of questions	Marks for each question	No. of questions	Total Marks	Percentage
1.	M.C.Q.	1	5	5	10%
2.	Very Short Answer Type (VSA)	1	5	5	10%
3.	Short Answer Type (SA1)	2	8	16	32%
4.	Short Answer Type (SA2)	3	4	12	24%
5.	Long Answer Type (LA)	4	3	12	24%
	Total		25	50	100%

The expected time for different types of question would be as follows:

Sr. No.	Form of questions	Approx. Time for each question in mins(t)	No. of questions (n)	Approx. Time for each form of question in mins (n x t)
1.	M.C.Q.	3	5	15
2.	Very Short Answer Type (VSA)	3	5	15
3.	Short Answer Type (SA1)	4	8	32
4.	Short Answer Type (SA2)	7	4	28
5.	Long Answer Type (LA)	10	3	30
	Total		25	120

As the total time is calculated on the basis of the number of questions required to be answered and the length of their anticipated answers, it would, therefore be advisable for the candidates to budget their time properly by cutting out the superfluous words and be within the expected time limits.

Scheme of Options

There will be no overall choice. However, there is an internal choice in Section C for 3 questions of 4 marks category.

E) Definiteness of Questions:

Sr. No.	Definiteness	No. of questions	Marks	Percentage
1.	Definite	25	50	100%
2.	Partly Definite	0	0	0
3.	Not Definite	0	0	0

F) Weigh Difficulty level of questions:

Sr. No.	Level of difficulty	No. of question	Marks	Percentage
1.	Easy	10	12	24%
2.	Average	12	30	60%
3.	Difficult	3	8	16%

A question may vary in difficulty level from individual to individual. As such, the assessment in respect of each question will be made by the paper setter on the basis of general anticipation from the group as a whole taking the examination. This provision is only to make the paper balanced in its weightage, rather than to determine the pattern of marking at any stage.

Goa Board of Secondary & Higher Secondary Education, Alto, Betim - Goa

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Subject: Mathematics(Voc.) **Timing :2hours** **Std: XII Computer Technique**

	Objective	Knowledge					Understanding					Application					Skill				Total
S.N	Contents/Units	MCQ (1)	VSA (1)	SA-1 (2)	SA-II (3)	LA (4)	MCQ (1)	VSA (1)	SA-1 (2)	SA-II (3)	LA (4)	MCQ (1)	VSA (1)	SA-I (2)	SA-II (3)	LA (4)	VSA (1)	SA-I (2)	SA-II (3)	LA (4)	**Total (50)**
1.	Numerical Methods								1(2)							1(4)					**2(6)**
2.	Correlation & Regression															1(4)					**1(4)**
3.	Matrices	1(1)					1(1)					3(1)			1(3)						**6(8)**
4.	Probability			1(2)					1(2)												**2(4)**
5.	Continuity														1(3)						**1(3)**
6.	Differentiation							2(1)	3(2)												**5(8)**
7.	Integration		2(1)						1(2)	1(3)											**4(7)**
8.	Definite Integration		1(1)											1(2)	1(3)						**3(6)**
9.	Linear Programming																			1(4)	**1(4)**
	Total	**5(6)**					**10(18)**					**9(22)**					**1(4)**				**25(50)**

Note: Figures outside the brackets indicate the no. of questions and those inside the brackets indicate the marks.

Syllabus for the Academic Year 2026 onwards

Goa Board of Secondary and Higher Secondary Education

Alto Betim, Goa

Course: Std. XII Vocational-Computer Techniques

Subject: Mathematics (Voc.)

Theory

Sr. No	Topic and Sub Topics	Marks Alloted
1	Numerical Methods • Construct Forward and Backward difference tables. (Only problems) • Lagranges Interpolation (Only problems) • Inverse Interpolation (Only problems)	6
2	Correlation and Regression • Correlation. • Definition and calculation of the correlation coefficient. • Positive, negative and perfect correlation. • Use of scatter diagram in interpreting the values of the correlation coefficients. • Calculations of regression coefficients and the equation of two lines of regression by method of least squares.	4
3	Matrices • Matrix as a rectangular arrangement of numbers. • Types of matrices: Row, Column, Zero, Square, Diagonal, Scalar, Unit, Symmetric, Singular, Non-Singular, Triangular, transpose of a matrix, determinant of a matrix, adjoint of a matrix. • Equality of matrices • Algebra of matrices: addition, subtraction, scalar multiplication, multiplication, commutativity and associativity of matrix operation. • Inverse of a matrix by Adjoint method. • Application to solving simultaneous equations in three variables using adjoint method.	8
4	Probability Random experiment and finite sample space, event, elementary events, mathematical definition of probability of an event	4
5	Continuity • Continuity of a function at a point • Left hand side and right hand side limits • Meaning of $x \to a$, $x \to a+$, $x \to a-$ • Continuity of a function at a point over an interval • Properties of continuous function (without proof)	3

6	**Derivatives** • Derivative of a function, its geometric and physical significance • Derivative of the sum, difference, product and quotient of a function • Derivative of a function – chain rule (uvw) • Derivatives of composite functions with reference to algebraic, logarithmic, exponential, trigonometric functions • Differentiation of implicit function, logarithmic differentiation	8
7	**Integration** • Integration as the inverse process of differentiation. Indefinite integrals • Properties of integrals • Integrals involving algebraic, trigonometric, logarithmic and exponential function • Integral of composite function • Integral of $\int \frac{f'(x)}{f(x)}\,dx$ • Integration by parts using LATE. (Inverse trigonometric functions are not included)	7
8	**Definite Integral and Applications** • Definition • Evaluation of definite integrals • Properties of definite integrals (first four) • Trapezoidal rule • Simpson's rule	6
9	**Linear Programming** • Linear inequalities in two variables and the graph of its solution • System of linear inequalities in two variables and the graph of its solution set • Meaning of linear programming and its importance, meaning of constraints, objective function, optimization, convex set (polygon) of the property that a linear function (objective function) over a convex polygon takes on its maximum value at other vertex of the polygon Linear Programming problem and its solution by graphical method.	4

References : 1. A NEW APPROACH TO MATHEMATICSAND STATISTICS
Higher Secondary Std : XII Science paper-I
S.G. Chitale, Dr. Mrs. N.A. Joshi

2. A NEW APPROACH TO MATHEMATICSAND STATISTICS
Higher Secondary Std: XII Science paper-II
S.G. Chitale, Dr. Mrs. N.A. Joshi

Internal Scheme (Practical)

Marks allotted for First term, and Second term practical examination

First term	50
Second term	50
Total	100

List of Practical's

First Term(50 marks)	Second Term(50 marks)
1. Coefficient of Correlation	7. Trapezoidal Rule
2. Regression of X on Y	8. Simpsons rule
3. Regression of Y on X	9. Lagrange's Interpolation
4. Addition of two matrices	10. Lagrange's Inverse Interpolation
5. Subtraction of two matrices	
6. Multiplication of two matrices	

Note: The above topics should be journalised and should contain the following:

i. Algorithms

ii. Programs using Python programming language

iii. Inputs

iv. Outputs

Goa Board Examination (50 marks) **Duration: 2 hrs.**

1	Numerical Methods (*1 question from the below mentioned sub topic of 2 marks*) • Construct Forward/Backward difference table and identify any two values (*1 question from the below mentioned sub topics of 4 marks each*) • Lagrange's Interpolation • Inverse Interpolation (Only problems)	6
2	Correlation and Regression *(1 question from any of the below mentioned sub topic of 4 marks)* • Calculation of the correlation coefficient. • Calculations of regression coefficients and the equation of two lines of regression by method of least squares.	4

3	**Matrices** *(5 questions of 1 mark each from the below sub topics)* • Matrix as a rectangular arrangement of numbers. • Types of matrices: Row, Column, Zero, Square, Diagonal, Scalar, Unit, Symmetric, Singular, Non-Singular, Triangular, transpose of a matrix, determinant of a matrix, adjoint of a matrix. • Equality of matrices • Algebra of matrices: addition, subtraction, scalar multiplication, multiplication, commutativity and associativity of matrix operation. • Inverse of a matrix by Adjoint method. *(1 question of 3 marks)* • Application to solving simultaneous equations in three variables using adjoint method.	8
4	**Probability** *2 questions of 2 marks each.*	4
5	**Continuity** *1 question of 3 marks*	3
6	**L.P.P** *(1 question from the below mentioned sub topics of 4 marks each)* • Maximize problem • Minimize problem	4
7	**Derivatives** *(2 questions of 1 mark and 3 questions of 2 marks from any of the below mentioned sub-topics)* • Derivative of the sum, difference, product and quotient of a function • Derivative of a function-chain rule • Derivative of composite functions with reference to algebraic, logarithmic, exponential, trigonometric functions • Logarithmic Differentiation, Differentiation of implicit functions	8
8	**Integration** *(2 questions of 1 mark, 1 question of 2 marks and 1 question of 3 marks from any of the below mentioned sub topics)* • Integration as the inverse process of differentiation. Indefinite integrals • Properties of integrals • Integrals involving algebraic, trigonometric, logarithmic and exponential function • Integral of composite function • Integral of $\int \frac{f'(x)}{f(x)} dx$ • Integration by parts using LATE. (Inverse trigonometric functions are not included)	7
9	**Definite Integral** • Evaluation of definite integrals – 1 question of 1 mark • Trapezoidal rule – 1 question of 2 marks • Simpson's rule – 1 question of 3 marks	6
	Total	**50**

Goa Board of Secondary and Higher Secondary Education

Alto Betim, Porvorim – Goa

Model Paper 2026 onwards

Std: XII Computer Technique **Maximum Marks: 50**

Sub: Mathematics (Voc.) **Duration : 2 hours**

No. of Questions: 25

Instructions: **i. All questions are compulsory**

ii. Write the question number of the corresponding answers clearly.

iii. There are four sections in this question paper (A,B,C&D)

iv. Section A contains 10 questions of 1 mark each.

v. Section B contains 8 questions of 2 marks each.

vi. Section C contains 4 questions of 3 marks each.

vii. Section D contains 3 questions of 4 marks each.

viii. Figures to the right indicate full marks.

ix. Graph should be drawn on the answer paper itself.

Section A

Question numbers from 1 to 10 carry 1 mark each.

1. A diagonal matrix in which all diagonal elements are equal is called:
   - Identity Matrix
   - Scalar Matrix
   - Null Matrix
   - Skew-Symmetric Matrix

2. If $\begin{bmatrix} a-b & 0 \\ 2 & b \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 2 & 1 \end{bmatrix}$ then value of a is:

   - 0
   - 1
   - 2
   - -2

3. If $\begin{bmatrix} 2 & x \\ -3 & 6 \end{bmatrix}$ is a singular matrix then x is equal to:

- 0
- 4
- -3
- -4

4. if $A = \begin{bmatrix} 2 & 4 \\ -1 & -2 \end{bmatrix}$ then A^2 is:

- $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$
- $\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}$
- $\begin{bmatrix} 4 & 16 \\ 1 & 4 \end{bmatrix}$
- $\begin{bmatrix} 4 & 8 \\ -2 & -4 \end{bmatrix}$

5. If $A = \begin{bmatrix} 1 & 4 \\ 2 & 5 \end{bmatrix}$ then $A + 5I$, where I is an identity matrix is:

- $\begin{bmatrix} 2 & 4 \\ 2 & 10 \end{bmatrix}$
- $\begin{bmatrix} 6 & 4 \\ 2 & 10 \end{bmatrix}$
- $\begin{bmatrix} 2 & 5 \\ 3 & 6 \end{bmatrix}$
- $\begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}$

6. Find the derivative of $\sin(x^2 + 4x)$ with respect to x.

7. Find the derivative of 3^{x^3} with respect to x.

8. Evaluate $\int (\frac{1}{x} + 3x^2)\, dx$

9. Evaluate $\int \sec^2(2x+1)\,dx$

10. Evaluate $\int_0^2 (2x+4)dx$

Section B

Question numbers from 11 to 18 carry 2 marks each.

11. Construct a forward difference table for the following data:

X	5	10	15	20	25
Y	3	5	2	0	5

Hence identify $\Delta^2 y_{10}$, $\Delta^3 y_{10}$

12. A card is drawn from a pack of 52 playing cards. Find the probability of getting a queen or a king.

13. Two unbiased dice are thrown. Find the probability that the product of numbers on their upper face is greater than 20.

14. Differentiate $e^{4x}.\sin 4x$ with respect to x.

15. Find $\frac{dy}{dx}$ if $x^2+y^2=8xy$

16. If $y=(\log x)^x$, find $\frac{dy}{dx}$

17. Evaluate $\int \frac{5\sin x}{15+5\cos x}dx$

18. Evaluate $\int_1^4 (2x)dx$ using Trapezoidal rule when $n=3$

Section C

Question numbers from 19 to 22 carry 3 marks each.

19. If f is continuous on [0,15] where

$$f(x) = \begin{cases} 3x^2 + 5x & 0 \leq x < 5 \\ ax + 13b & 5 \leq x < 10 \\ x^2 - 3x & 10 \leq x \leq 15 \end{cases}$$

Find the value of a and b.

20. Find the inverse of $\begin{bmatrix} 1 & 3 \\ 1 & 4 \end{bmatrix}$ using adjoint method.

21. Evaluate $\int x.sinx \ dx$

22. Evaluate $\int_0^4 (2x + 1)\, dx$ using Simpson's rule when $n = 4$

Section D

Question numbers from 23 to 25 carry 4 marks each.

23. For the following table

x	0	2	4
f(x)	4	6	8

Using Lagrange's Inverse Interpolation formula, find the value of x when f(x)=7.

24. Obtain the regression line of y on x for the following data:

x	6	7	8	9
y	5	4	3	2

25. Solve the L.P.P. by graphical method.

Maximise $Z = 3x + 5y$

subject to $x \leq 4, y \geq 2, 2x + 3y \leq 6$

and $x \geq 0, y \geq 0$

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