Reg. No. | | | | | | | | |

G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2025.
(For those admitted in June 2023 and later)

PROGRAMME AND BRANCH: B.Sc., ELECTRONICS

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
V	PART - III	CORE ELECTIVE -2	U23EL5E2A	MATHEMATICAL CONCEPTS FOR ELECTRONICS

Date & Session: 11.11.2025/FN **Time : 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	SECTION – A (10 X 1 = 10 Marks) Answer ALL Questions.
CO1	K1	1.	If α and β are the roots of the quadratic equation $ax^2 + bx + c = 0$, then the value of α + β is: a) c/a b) -b/a c) b/a d)-c/a
CO1	K2	2.	If α and β are the roots of the quadratic equation $ax^2 + bx + c = 0$, then the value of αβ is: a) c/a a) c/a c) b/a c) b/a
CO2	K1	3.	If α is a root of $f(x)$=0 with multiplicity p, then $x_{n+1} = x_n - p\frac{f(x_n)}{f'(x_n)}$ is the iteration formula of a) Bisection Method of Bolzano Method b) Newton Method c) Regula Falsi Method d) Horner's Method.
CO2	K2	4.	Which of the following is a necessary condition for the bisection method to work? a) The function must be differentiable b) The function must be differentiable c) The function must be monotonic d) The function must be monotonic
CO3	K1	5.	In Gaussian elimination method, original equations are transformed by using _____. a) Column operations b) Mathematical Operations c) Row Operations d) Subset Operation
CO3	K2	6.	The augmented matrix in Gauss Jordan method is reduced to _____. a) Row Echelon form b) Column Echelon form c) Matrix Echelon form d) Augmented form
CO4	K1	7.	Let $y = f(x)$ be a given function of x and let $y_0, y_1, \dots, y_n$ be the values of y corresponding to. $x_0, x_1, \dots, x_n$. Then $y_1 - y_0, y_2 - y_1, y_3 - y_2, \dots, y_n - y_{n-1}$ are called the a) first differences of y b) infinite differences of y c) higher differences of y d) finite differences of y

CO4	K2	8.	Backward difference operator is denoted by. a) Δ b) ∇ c) φ d)τ
CO5	K1	9.	Which of the following interpolation methods can be used for data with unequal intervals? a) Newton-Gregory Forward Interpolation b) Newton-Gregory Backward Interpolation c) Lagrange Interpolation d) Linear Interpolation
CO5	K2	10.	Newton- Gregory Forward interpolation formula can be used _____. a) only for equally spaced intervals b) only for unequally spaced intervals c) for both equally and unequally spaced intervals d) for unequally intervals
Course Outcome	**Bloom's K-level**	**Q. No.**	**SECTION – B (5 X 5 = 25 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	11a.	If α and β are the roots of the quadratic equation $2x^2 + 3x - 5 = 0$, find the value of $\alpha^2 + \beta^2$. **(OR)**
CO1	K3	11b.	If α and β are the roots of the quadratic equation $x^2 + 4x + 2 = 0$, find the value of $1/\alpha + 1/\beta$.
CO2	K3	12a.	Use the Regula Falsi Method to find the root of the equation $x^3 - 2x - 5 = 0$ in the interval [2, 3] with an accuracy of 0.01. **(OR)**
CO2	K3	12b.	Find the root of $x^4 - 2x^3 - 13x^2 + 14x + 12 = 0$ given that x = -1 is a root.
CO3	K4	13a.	Solve the system of equations using Gauss Elimination method: x + 2y + z = 3 2x + 3y + 3z = 10 3x - y + 2z = 13 **(OR)**
CO3	K4	13b.	Solve the system of equations using Gauss Jordan method: x + y + z = 5 2x + 3y + 5z = 8 4x + 5z = 2
CO4	K4	14a.	Given the following table of values, use Newton Forward Interpolation formula to find the value of y at x = 2.5. x: 1, 2, 3, 4 f(x): 1, 4, 9, 16 **(OR)**
CO4	K4	14b.	Given the following table of values, use Newton Backward Interpolation formula to find the value of y at x = 3.5. x: 1, 2, 3, 4 f(x): 1, 4, 9, 16
CO5	K5	15a.	Given the following table of values, find the divided differences and use them to find the value of y at x = 1.5. x: 0, 1, 2, 3 y: 0, 1, 4, 9 **(OR)**

CO5	K5	15b.	Given the following table of values, use Newton's Divided Difference formula to find the value of y at x = 2.2.

x	1	2	3	4
y	3	5	9	15

Course Outcome	Bloom's K-level	Q. No.	**SECTION – C (5 X 8 = 40 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	16a.	If α, β, and γ are the roots of the cubic equation $x^3 - 6x^2 + 11x - 6 = 0$, find the values of α + β + γ, αβ + βγ + γα, and αβγ.
			(OR)
CO1	K3	16b.	If α, β, and γ are the roots of the cubic equation $2x^3 - 4x^2 + 3x - 1 = 0$, find the values of α + β + γ, αβ + βγ + γα, and αβγ.
CO2	K4	17a.	Using Newton-Raphson method, find the root of the equation x^3 + 2x^2 - 7x - 12 = 0 near x = 2. Perform three iterations and find the approximate value of the root correct to four decimal places.
			(OR)
CO2	K4	17b.	Using Bisection Method, find the root of the equation x^3 - x - 1 = 0 in the interval [1, 2].
CO3	K4	18a.	Solve the system of equations using Gauss Jacobi method: 5x + y + z = 10 x + 4y + z = 7 x + y + 5z = 8
			(OR)
CO3	K4	18b.	Solve the system of equations using Gauss Jacobi method: 4x + y + z = 6 x + 3y + z = 5 x + y + 4z = 7
CO4	K5	19a.	Given the following data, find the value of f(1.5) using Newton's forward interpolation formula.

x	1	2	3	4
f(x)	2	4	8	16

(OR)

CO4	K5	19b.	Given the following table of values, use Newton Backward Interpolation formula to find the value of y at x = 4.5.		

x	1	2	3	4	5
f(x)	2	5	10	17	26

CO5	K5	20a.	Given the following table of values, use Newton's Divided Difference formula to find the value of y at x = 3.8.		

x	1	2	3	4	5
f(x)	2	4	6	8	10

(OR)

CO5	K5	20b.	Given the following table of values, use Lagrange's Interpolation Formula to find the value of y at x = 3.		

x	1	2	4	5
f(x)	2	5	11	14