Department- All	Semester- 1st	Name Of the Teaching Faculty- Biswajit Samal and Gayatri Behera No. of weeks- 36 Session- 2026-27
Subject- Engineering Mathematics-I	No. of days per week- 04	
Week	**Class**	**Topic to be taught**
1.	1.	Introduction, Types of Matrices
	2.	Algebra of matrices
	3.	Questions on Matrices
	4.	Determinants up to 3x3 matrices and its properties
2.	5.	Minor, Co-factor
	6.	adjoin and inverse of matrices
	7.	Questions on Inverse of Matrices
	8.	System of Linear Equations, its matrix form,
3.	9.	constancy and inconsistency of a linear system
	10.	Cranmer's rule and its examples
	11.	Solution of linear system using inverse of matrix
	12.	**Exercise Questions and Doubt Clear**
4.	13.	Concept of Angle , its type and conversion
	14.	Introduction to Trigonometry
	15.	Trigonometric ratios and other formulae
	16.	ASTC Rule and questions on identity using ASTC Rule
5.	17.	Trigonometric values and table
	18.	Compound angles and related angles
	19.	Covert into acute angle and test for +ve or –ve
	20.	-ve angle and further convert into acute angle
6.	21.	Addition and difference formulae, $\sin 75°, \sin 15°, \cos 75°, \cos 15°$
	22.	Multiple angles like $\sin 2A, \cos 2A, \tan 2A, \cot 2A$
	23.	Sub-multiple angles like $\sin\frac{A}{2}, \cos\frac{A}{2}, \tan\frac{A}{2}$; also $\sin 3A, \cos 3A, \tan 3A$
	24.	Graphs of Trigonometric Functions
7.	25.	**Exercise Questions and Doubt Clear**
	26.	**Exercise Questions and Doubt Clear**
	27.	Introduction of geometry in two dimension, Distance formulae
	28.	Slope of a line, angle between two lines, condition of perpendicularity and parallelism
8.	29.	Graph of different lines
	30.	Different forms of straight lines i) One point form, (ii) two point form
	31.	(iii) slope form, (iv) intercept form, (v) Perpendicular form
	32.	Intersection of two lines and perpendicular distance formula
9.	33.	**Exercise questions and doubt clear**
	34.	**Monthly Test-I**
	35.	Equation of a line passing through a point and (i) parallel to a line and (ii) Perpendicular to a line
	36.	Equation of a line passing through the intersection of two lines, Distance of a point from a line
10.	37.	Equation of a circle

PRINCIPAL SIGN

HOD SIGN

FACULTY SIGN

PRINCIPAL
Synergy School of Engineering
Dhenkanal

		(i) centre radius form
	38.	(ii) general equation of a circle (iii) end point of diameter form
	39.	Circle passing through three points
	40.	Exercise of Circle
11.	41.	Definition of conics, parabola and its questions
	42.	Ellipse and its questions
	43.	Hyperbola and its questions
	44.	**Exercise Questions and Doubt Clear**
12.	45.	Introduction to 3D, Distance formulae
	46.	Section formulae and its questions
	47.	Direction ratio, direction cosine
	48.	Angle between two lines (condition of parallelism and perpendicularity)
13.	49.	Equation of a plane(General form), angle between two planes
	50.	perpendicular distance of a point from a plane
	51.	Equation of a plane passing through a point and i) parallel to a plane and (ii) perpendicular to a plane
	52.	**Exercise Questions and Doubt Clear**
14.	53.	Introduction to Spear, Equation of a sphere i) centre radius form
	54.	ii) general form iii) two end points of a diameter form
	55.	More questions on previously taught topics
	56.	**Exercise Questions and Doubt Clear**
15.	57.	**Monthly Test-II**
	58.	**Previous Year Question Discussion**
	59.	**Selective questions practice**
	60.	**Doubt Clear Class & Quiz Test**
16.	61.	Introduction of complex number
	62.	Algebra of complex number
	63.	Equality of complex number
	64.	Conjugate of complex number and related problems
17.	65.	Modulus of complex number and related problems
	66.	Square root of complex number
	67.	Polar and Cartesian representation of a complex number and its conversion from one form to other
	68.	Cube roots of unity
18.	69.	De-movire's theorem and simple application
	70.	**Exercise Questions and Doubt Clear**
	71.	**Monthly Test-III**
	72.	**Previous Year Question Discussion**
19.	73.	**Selective questions practice**
	74.	**Doubt Clear Class & Quiz Test**
	75.	Definitions of partial fraction ,polynomial function,proper and improper fraction
	76.	Resolve proper fraction into partial fractions with denominator containing non-repeated linear factors

PRINCIPAL SIGN

PRINCIPAL
Synergy School of Engineering
Dhenkanal

HOD SIGN

FACULTY SIGN

20.	77.	Resolve proper fraction into partial fractions with denominator containing repeated linear factors
	78.	Resolve proper fraction into partial fractions with denominator containing non-repeated irreducible quadratic factors
	79.	**Exercise Questions and Doubt Clear**
	80.	**Monthly Test-Iv**
21.	81.	**Previous Year Question Discussion**
	82.	**Selective questions practice**
	83.	**Doubt Clear Class & Quiz Test**
	84.	Factorial of a non-negative integer
22.	85.	**Determine P(n,r) and C(n,r)**
	86.	Binomial theorem for positive integral index
	87.	Determination of general term and middle term in binomial expansion
	88.	**Exercise Questions and Doubt Clear**
23.	89.	**Monthly Test-Iv**
	90.	**Previous Year Question Discussion**
	91.	**Selective questions practice**
	92.	**Doubt Clear Class & Quiz Test**
24.	93.	Introduction to vector algebra
	94.	Notation and rectangular resolution of a vector
	95.	Types of vector
	96.	Algebra of vectors
25.	97.	Scalar and vector products of two vectors
	98.	Angle between two vectors
	99.	Scalar and vector projection of a vector on another vector
	100.	Angle between two vectors
26.	101.	Area of triangle and parallelogram
	102.	Simple problems related to work and moment of force
	103.	**Exercise Questions and Doubt Clear**
	104.	**Monthly Test-v**
27.	105.	**Previous Year Question Discussion**
	106.	**Selective questions practice**
	107.	**Doubt Clear Class & Quiz Test**
	108.	Introduction to limit and continuity
28.	109.	Types of functions
	110.	Definition limit of function and existence of limit of a function
	111.	Algebra of limits
	112.	Evaluation of limits using standard forms
29.	113.	Test of continuity of a function with respect to another function
	114.	**Exercise Questions and Doubt Clear**
	115.	**Monthly Test-vi**
	116.	**Previous Year Question Discussion**
30.	117.	**Selective questions practice**
	118.	**Doubt Clear Class & Quiz Test**
	119.	Differentiation of algebraic functions,exponential function ,logarithmic function ,trigonometric and inverse trigonometric functions
	120.	Differentiation of sum,product and quotient functions
31.	121.	Differentiation of function of a function

PRINCIPAL SIGN

HOD SIGN

FACULTY SIGN

PRINCIPAL
Synergy School of Engineering
Dhenkanal

	122.	Differentiation using logarithm
	123.	Differentiation of a function with respect to another function
	124.	**Exercise Questions and Doubt Clear**
32.	125.	**Monthly Test-vii**
	126.	**Previous Year Question Discussion**
	127.	**Selective questions practice**
	128.	**Doubt Clear Class & Quiz Test**
33.	129.	Integration as inverse process of differentiation
	130.	Simple integration by substitution
	131.	Integration by parts
	132.	Integration using partial fractions
34.	133.	Definite integrals of some simple functions
	134.	Properties of definite integrals
	135.	Simple problems on evaluation of area bounded by a curve
	136.	**Exercise Questions and Doubt Clear**
35.	137.	**Monthly Test-viii**
	138.	**Previous Year Question Discussion**
	139.	**Selective questions practice**
	140.	**Doubt Clear Class & Quiz Test**
36.	141.	Introduction to differential equation
	142.	Formation of differential equation
	143.	Solution of first order and first degree differential equation by variable separable method
	144.	So9lution of linear differtial equations
	145.	**Monthly Test-ix**

PRINCIPAL SIGN

PRINCIPAL
Synergy School of Engineering
Dhankanal

HOD SIGN

FACULTY SIGN