LESSON PLAN

DISCIPLINE: MATH AND SCIENCE	SEMESTER: SECOND	NAME OF THE TEACHING FACULTY: SMT. PRATIVA PATRA

SUBJECT: ENGG. MATHEMATICS-II	NO. OF. DAYS PER WEEK CLASS ALLOTED	SEMESTER: FROM 01/02/2024 **TO** 14/05/2024
WEEK	**CLASS DAY**	**THEORY**
1ST	1ST	Introduction of Relation
	2ND	Definition of Functions based on set theory
	3RD	Types of Functions, (i) Constant Function (ii) Identity Function (iii) Absolute Function (iv) Greatest Integer Function
	4TH	(v) Trigonometric Function (vi) Exponential Function (vii) Logarithmic Function.
	5TH	Introduction of Limit.
	6TH	Problems based on the above.
2ND	1ST	Existence of Limit
	2ND	Methods of evaluation of Limit (i) $\lim_{x \to 0} \frac{x^n - a^n}{x-a} = na^{n-1}$ (ii) $\lim_{x \to 0} \frac{a^n - 1}{x} = \log_e a$ (iii) $\lim_{x \to 0} \frac{e^x - 1}{x} = 1$
	3RD	(iv) $\lim_{x \to 0} (1+x)^{\frac{1}{x}} = e$ (v) $\lim_{x \to 0} \left(1 + \frac{1}{x}\right)^x = e$ (vi) $\lim_{x \to 0} \frac{\log(1+x)}{x} = 1$
	4TH	(vii) $\lim_{x \to 0} \frac{Sinx}{x} = 1$ (vii) $\lim_{x \to 0} \frac{tanx}{x} = 1$
	5TH	Definition of Continuity of a Function at a point and problems based on it.
	6TH	Copy checking and doubt clear class.
3RD	1ST	Derivative of a function at a point.

	2ND	Algebra of derivatives.
	3RD	Derivative of Standard Functions.
	4TH	Problems based on derivative using formula.
	5TH	Problems based on derivative using formula.
	6TH	Doubt clear class.
4TH	1ST	Derivative of Composite functions (chain rule).
	2ND	Problems based on Composite functions.
	3RD	Derivative of Inverse Trigonometric functions.
	4TH	Problems based on Inverse Trigonometric functions.
	5TH	Differentiation by Trigonometrical Transformations
	6TH	Doubt clear class.
5TH	1ST	Methods of Differentiation: (i) Parametric functions
	2ND	(ii) Implicit functions
	3RD	Problems based on Parametric and Implicit functions.
	4TH	(iii) Logarithmic functions
	5TH	Problems based on Logarithmic functions
	6TH	Copy checking and Doubt clearing class.
6TH	1ST	Derivative of a function with respect to another function.
	2ND	Application of Derivative: (i) Successive differentiation (upto second order)
	3RD	Problems based on Successive derivatives.
	4TH	(ii) Partial differentiation (Function of two variables upto second order)
	5TH	Problems based on Partial differentiation.
	6TH	Copy checking and Doubt clearing class.
7TH	1ST	Definition of integration as inverse of differentiation
	2ND	Integral of standard functions
	3RD	Methods of integration: (i)Integration by substitution
	4TH	Problems based on substitution method
	5TH	(ii) Integration by Parts
	6TH	Problems based on Integration by Parts

8TH	1ST	Integration of the form (i) $\int \frac{dx}{x^2+a^2}$ (ii) $\int \frac{dx}{x^2-a^2}$ (iii) $\int \frac{dx}{a^2-x^2}$
	2ND	Integration of the form (iv) $\int \frac{dx}{\sqrt{x^2-a^2}}$ (v) $\int \frac{dx}{\sqrt{a^2-x^2}}$ (vi)$\int \frac{dx}{\sqrt{x^2+a^2}}$
	3RD	Integration of the form (iv) $\int \frac{dx}{x\sqrt{x^2-a^2}}$ (v)$\int \sqrt{a^2-x^2}\ dx$ (vi)$\int \sqrt{a^2+x^2}\ dx$ (vii) $\int \sqrt{x^2-a^2}\ dx$
	4TH	Problems based on above.
	5TH	Definite Integral
	6TH	Properties of definite integral
9TH	1ST	Properties of definite integrals
	2ND	Problems based on Properties of definite integrals
	3RD	Application of integration: (i) Area enclosed by a curve and X- axis.
	4TH	Area of circle with center at origin.
	5TH	Question and answer based on area.
	6TH	Class test.
10TH	1ST	Order and Degree of differential equation.
	2ND	Solution of differential equation of 1st order and 1st degree equation by method of separation of variables.
	3RD	Question and answer based on this.
	4TH	Liner equation of the form $\frac{dy}{dx}+py=Q$ where P and Q are the function of x.
	5TH	Liner equation of the form $\frac{dx}{dy}$ + px =Q ,where P and Q are the function of y.
	6TH	Doubt clear and copy checking.
11TH	1ST	Previous year questions based on differential equation.
	2ND	Vector algebra: Introduction
	3RD	Types of vectors
	4TH	Representation of vector
	5TH	Magnitude and direction of vectors.

	6TH	Question based on this
12TH	1ST	Addition and subtraction of vectors.
	2ND	Position vector
	3RD	Condition of co-linearity
	4TH	Scalar product of two vectors. (Dot product)
	5TH	Geometrical meaning of dot product.
	6TH	Problems based on this.
13TH	1ST	Angle between two vectors.
	2ND	Scalar and vector projection of two vectors.
	3RD	Vector product (cross product).
	4TH	Geometrical meaning of vectors product.
	5TH	Area of triangle and parallelogram.
	6TH	Problem based on this.
14TH	1ST	Revision on vector Algebra
	2ND	Revision on vector Algebra
	3RD	Revision on Limit and continuity
	4TH	Revision on Limit and continuity
	5TH	Revision on Derivatives
	6TH	Revision on Derivatives
15TH	1ST	Revision on Derivative
	2ND	Revision on Integration
	3RD	Revision on Integration
	4TH	Revision on Integration
	5TH	Revision on Differential Equation
	6TH	Revision on Differential Equation

Reference Books:

Text Book of Engineering Mathematics-II (Kalyani publication)
Elements of Mathematics(XII)