LESSON PLAN
JHARSUGUDA ENGINEERING SCHOOL,JHARSUGUDA

Name of the Faculty: **Satyananda Gadtia & Bhubaneswari Mishra**	Academic Year: **2023-24**
	Dept: **Math & Science**
Course No.: **TH-3**	Course Name: **MATHEMATICS-II**
Program: Diploma	Branch: Civil, Mechanical, Electrical, Etc and IT
Year/Sem: **2ⁿᵈ sem(1ˢᵗ year)** Session: **Summer**	Section: **C,M(a),M(b),E(a),E(b),T**

WEEK	Period	Topic to be Covered
1.	1.	**VECTOR ALGEBRA**: Introduction, Types of vectors (null vector, parallel vector , collinear vectors) (in component form).
	2.	Representation of vector, example of vector
	3.	Magnitude and direction of vectors
	4.	Addition and subtraction of vectors with some example
	5.	Properties of Addition and subtraction of vectors
	6.(Tutorial)	Math Tutorials, problem solving of above
2.	7.	Position vector & its example
	8.	Scalar product of two vectors & its example
	9.	Geometrical meaning of dot product,& its example
	10.	Angle between two vectors & its questions
	11.	Scalar and vector projection of two vectors & discuss its example
	12.(Tutorial)	Math Tutorials, problem solving of above questions
3.	13.	Vector product and geometrical meaning with some example
	14.	Finding Area of triangle and parallelogram with important example
	15.	Exercise questions solving of Vector algebra
	16.	Questions solving of vector algebra
	17.	**LIMITS AND CONTINUITY**: Definition of function, based on set theory
	18.(Tutorials)	Math Tutorials, problem solving .
4.	19.	Types of functions i) Constant function ii) Identity function
	20.	iii) Absolute value function iv)The Greatest integer function
	21.	v) Trigonometric function vi) Exponential function vii) Logarithmic function

	22.	Introduction of limit
	23.	Limit of a function
	24. .(Tutorial	Math Tutorials, problem solving of limits
5.	25.	Existence of limit
	26.	Methods of evaluation of limit
	27.	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) $\lim_{x \to 0} \frac{e^x - 1}{x} = 1$
	28.	iv) $\lim_{x \to 0} (1 + X)^{\frac{1}{x}} = e$, v) $\lim_{x \to 0} 1 + \frac{1}{x} = e$ vi) $\lim_{x \to 0} \frac{\log(1+x)}{x} = 1$
	29.	vii) $\lim_{x \to 0} \frac{sinx}{x} = 1$ viii) $\lim_{x \to 0} \frac{tanx}{x} = 1$
	30. .(Tutorial	Math Tutorials, problem solving .
6.	31.	Questions solving of limits and evolutions of limits
	32.	Definition of continuity of a function at a point
	33.	problems based on continuity
	34.	Exercise questions solving
	35.	**DERIVATIVES**: Derivative of a function at a point
	36. .(Tutorial	Math Tutorials, problem solving and doubt clear
7.	37.	Algebra of derivative
	38.	Geometrical interpretations of the Derivatives
	39.	Derivative of standard functions
	40.	Derivatives of Trigonometric Functions
	41.	Derivative of composite function (Chain Rule)& its example
	42. .(Tutorial	Math Tutorials, problem solving and doubt clear of above
8.	43.	Derivatives of inverse trigonometric function
	44.	Derivatives of trigonometric transformation
	45.	Example solving of inverse trigonometric function and trigonometric transformation
	46.	Methods of differentiation of i) Parametric function and exponential functions
	47.	Example solving of Parametric function and exponential functions

	48. .(Tutorial	Math Tutorials, problem solving and doubt clear of Derivatives
9.	49.	Derivatives of ii) implicity function
	50.	Derivatives of iii) Logarithmic function
	51.	Derivatives of iv) a function with respect to another function
	52.	Applications of Derivative i) Successive Differentiation (up to second order)
	53.	Some important example solving of successive Differentiation
	54. .(Tutorial	Math Tutorials, problem solving and doubt clear fundamentals of integration
10.	55.	Partial Differentiation (function of two variables up to second order)
	56.	Example of Partial Differentiation
	57.	Problems based on whole Derivatives
	58.	**INTEGRATION:** Definition of integration as inverse of differentiation
	59.	General properties of integration
	60. .(Tutorial	Math Tutorials, problem solving of integrations
11.	61.	Integrals of standard functions & its example
	62.	Methods of integration i) integration by using standard formulae
	63.	ii) Integration by substitution with its example
	64.	Integrations by using trigonometric identities
	65.	Integrations by Trigonometric substitution
	66. .(Tutorial	Math Tutorials, problem solving
12.	67.	iii) Integration by parts
	68.	Integration of the following forms i)$\int dx/x^2 + a^2$ ii) $\int dx/x^2 - a^2$ iii) $\int dx/a^2 - x^2$
	69.	iv)$\int dx/\sqrt{x^2 + a^2}$ v)$\int dx/\sqrt{x^2 - a^2}$ vi) $\int dx/\sqrt{a^2 - x^2}$
	70.	vii)$\int dx/x\sqrt{} \sqrt{x^2 - a^2}$ viii)$\int \sqrt{a^2 - x^2}$
	71.	ix)$\int a^2 + x^2$ x) $\int x^2 - a^2$
	72. .(Tutorial	Math Tutorials, problem solving
13.	73.	Some important example of Integration by parts
	74.	Integrations of different forms

	75.	Definite integral, properties of definite integrals
	76.	Application of integration
	77.	i) Area enclosed by a curve and X – axis
	78. .(Tutorial)	Math Tutorials, problem solving
14.	79.	Area of a circle with centre at origin
	80.	**DIFFERENTIAL EQUATION** :Introductions of differential equations
	81.	Order and degree of a differential equation
	82.	Linear and Non-linear Differential Equation
	83.	Solution of differential equation
	84. .(Tutorial	Math Tutorials, problem solving
15	85.	1st order and 1st degree equation by the method of separation of variables
	86.	Linear equation , where P,Q are functions of x
	87.	Linear equation example solving
	88.	Some important questions of linear equations
	89.	Exercise questions solving of differential equations
	90. .(Tutorial	Math Tutorials, problem solving

Bhubaneswari Mishra.
18.01.24.

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18/01/24

Signature of faculty member

18/01/24

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