TRADE MARK

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Teacher's Lesson Note

ENGINEERING MATHEMATICS-I

1st Sem (Winter) - 2023-2024

MECHANICAL - I & II, CIV

NAME - Dinesh Kumar Sethy

TEACHERS LESSON NOTE

Date	Week / Period	Class	Subject	Topic (Concept)	Sub-Topic (Sub-Concept)	Learning Activities to be taken up	TLM to be used	Evaluative Questions	Expected learning outcome	Project work to be assigned	Signature of the Teacher	Signature of the Headmaster	Remark
1	2	3	4	5	6	7	8	9	10	11	12	13	14
16/08/2023	1st Week	1st	MATH-1	Algebra	Matrices & Determinant	Types of matrices			• Definition of matrix. Ex- $A=\begin{bmatrix} a_{11} & \cdots & a_{1n} \\ a_{m1} & - & a_{mn} \end{bmatrix}$		Dsth 16/08/23	16/08/23	
17/08/2023		2nd		"		"			Derive the types of matrix • Row matrix • Column matrix • Null matrix		Dsth 17/08/23	17/08/23	
18/08/2023		3rd		"		Algebra of matrix			Describe about equality of matrix • Addition of matrix with Example		Dsth 18/08/23	18/08/23	
21/08/2023		4th		"		"			Describe about properties of matrix with Example • Commutative • associative • Identity matrix • Additive Inverse		Dsth 21/08/23	21/08/23	

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
22/08/2023	3rd Week	1st	MATH -1	Algebra		Determinant • Minor & Cofactor • Expansion of determinants		Find the minor & Cofactor of all elements of the matrix (i) $\begin{vmatrix} 2 & 3 \\ -1 & 4 \end{vmatrix}$ (ii) $\begin{vmatrix} 1 & 2 & 1 \\ 2 & 1 & 3 \\ 1 & 4 & 2 \end{vmatrix}$	Describe about determinant order 2, Higher order determinants with examp		Death 22/08/23	Death 22/08/23	
23/08/2023		2nd				properties of Determinant		Expand $\begin{vmatrix} 1 & 1 & 1 \\ x & y & z \\ x^3 & y^3 & z^3 \end{vmatrix}$ by using properties of determinant	Describe Property-1 property-2 $\lvert A' \rvert = A$ where A' = transpose of matrix A pro-3, pro-4, pro-5		Death 23/08/23	Death 23/08/23	
24/08/2023		3rd				Inverse of a matrix		Find the inverse of the matrix $\begin{bmatrix} 1 & 4 \\ -1 & 0 \end{bmatrix}$	Describe Inverse of Matrix & problem Solve		Death 24/08/23	Death 24/08/23	
25/08/23		4th				Cramer's Rule		Solve by Cramer's rule $2x - 3y = 8$ $3x + y = 1$	Derive $a_1x + b_1y = d_1$ $a_2x + b_2y = d_2$ $\frac{x}{d_1b_2 - d_2b_1} = \frac{y}{a_1d_2 - a_2d_1} = \frac{1}{a_1b_2 - a_2b_1}$		Death 25/08/23	Death 25/08/23	

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1	2	3	4	5	6	7	8	9	10	11	12	13	
25/08/2023	3rd week	1st	MATH -I	Algebra		Solution of Simultaneous eqn by matrix Inverse method		consider the following System of linear eqn $3x+4y=1$ $2x+y=8$	Describe about $a_1x+b_1y=c_1$ $a_2x+b_2y=c_2$ $AX=B$		28/08/23	28/08/25	
29/08/2023		2nd		Trigonometry		Trigonometrical Ratios			Describe about Introduction of Trigonometric • Measurement of an angle • Sexagesimal System		29/08/23	29/08/25	
31/08/2023		3rd				//			• Centesimal System • Circular System Describe about all quadrant		31/08/23	31/08/25	
7/09/2023		4th				Trigonometric Funn			Trigonometric Funn are given by $\sin: R \to [-1,1]$ $\cos: R \to [-1,1]$ $\tan: R - (2n+1)$		7/09/23	7/09/23	

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
7/09/2023	4th week	1st	MATH-I	Trigonometry		Trigonometry Identity $\sin^2\theta+\cos^2\theta=1$ $\sec^2\theta-\tan^2\theta=1$ $\operatorname{cosec}^2\theta-\cot^2\theta=1$		prove that $\frac{\sin\theta}{1+\cos\theta}+\frac{1+\cos\theta}{\sin\theta}$ $=2\operatorname{cosec}\theta$	Now prove that $\sin^2\theta+\cos^2\theta=1$ $\sec^2\theta-\tan^2\theta=1$ $\operatorname{cosec}^2\theta-\cot^2\theta=1$		07/09/23	07/09/23	
12/09/2023		2nd				Sign of T Ratios			Describe about Sign of T Ratios in Right Angle		12/09/23	12/09/23	
13/09/23		3rd				Trigonometric Ratio of Selected angle		Find the value of $\frac{5\cos^2 60^\circ+4\sec^2 30^\circ-\tan^2 45^\circ}{\sin^2 30^\circ+\cos^2 30^\circ}$	The value of of T Ratios of some Selected angle like 0° to 90°		13/09/23	13/09/23	
14/09/23		4th				"		State $\cos 302^\circ$ is positive or negative	Values of T-Ratios of allied angles T-Ratios of $(-\theta)$ interms of θ		14/09/23	14/09/23	

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
21/09/2023	5th week	1st	MATH -I	Trigonometry		Addition Theorem		Prove that $\sin A \cdot \sin(B-C) + \sin B \sin(C-A) + \sin C \sin(A-B) = 0$	Proof that (i) $\sin(A+B) = \sin A \cos B + \cos A \sin B$ (ii) $\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \cdot \tan B}$		Dc.Th 21/09/23	Dc.Th 21/09/23	
22/09/2023		2nd				Inverse Trigonometric Fun^n		prove that • Self adjusting • Reciprocal property • Conversion property	Describe about properties of Inverse Trigonometric fun^n		Dc.Th 22/09/23	Dc.Th 22/09/23	
25/09/23		3rd				//		prove that $\sin^{-1}\frac{4}{5} + \sin^{-1}\frac{5}{13} = \cos^{-1}\frac{16}{65}$	Describe about Theorem-1 to Theorem-7.		Dc.Th 25/09/23	Dc.Th 25/09/23	
27/09/2023		4th				//			problem Solve (Trigonometry		Dc.Th 27/09/23	Dc.Th 27/09/23	

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
30/09/2023	6th WEEK	1st	MATH-I	Coordinate geometry in two dimension Two Dimensional Geometry		Introduction			Describe about coordinate geometry in two dimensions		Ds.Th 30/09/23	30/9/23	
03/10/2023		2nd				Coordinate System			Discuss about Coordinates System • origin • Quadrant		Ds.Th 03/10/23	03/10/23	
5/10/2023		3rd				Representation of any point (x,y) on the Cartesian plane		Find the distance both the point P(1,2) & Q(2,-3)	Distance formula Describe		Ds.Th 5/10/23	5/10/23	
6/10/2023		4th				Division/ Section formula		Find the Coordinates of the Point which divides the line joing the point P(2,3) & Q(3,1) in ratio 3:2	Describe about Internal division • Midpoint formula • External division		Ds.Th 6/10/23	06/10/23	

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
11/10/2023	7th Week	1st	MATH-7	Coordinate geometry in two dimensional Geometry (Two Dimensional Geometry)		Centroid of triangle		• Two vertices of a triangle are (1,2), (3,5) & its Centroid is at the origin.	Describe about Centroid of triangle		Dc.Th 11/10/23	11/10/23	
12/10/23		2nd				Area of a triangle		Find the area of angle whose vertices are A(4,4), B(3,-2) & C(-3,10)	Describe the Area of a triangle		Dc.Th 12/10/23	12/10/23	
17/10/23		3rd				Slope (Gradient) of a line.			Slope of a line Joining two point P(x1, y1) & Q(x2, y2)		Dc.Th 17/10/23	17/10/23	
07/11/23		4th						Find Slope of a line Joing P(2,3) & Q(1,4)	Diff betn vertical line & Horizontal line		Dc.Th 07/11/23	07/11/23	

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
10/11/23	8th	1st	MATH-I	Coordinate geometry in two dimensi		Condition of parallelism & perpendi cularity			(1) Two line L_1 & L_2 are parallel (2) Two lines are perpendicular to each other		10/11/23	10/11/23	
15/11/23		2nd				Angle betn two lines		Determine x so that the line passing through (3,4) & (x,5) makes 135°	Describe about Angle betn two lines		15/11/23	15/11/23	
23/11/23		3rd				Eqn of line passing through a point			• Parallel to a line • ⊥ or to line		23/11/23	24/11/23	
24/11/23		4th				Equation of a line passing through the intersection of two lines		Find the distance betn the parallel lines $3x-4y+9=0$ $6x-8y-15=0$	Distance of a point from a line		24/11/23	24/11/23	

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
25/11/2023	9th	1st	MATH-I	~~Circle~~ Two Dimensional Geometry	Circle	Definition of Circle			• Standard Form of a circle Some particular cases ① When the circle passes through the origin		25/11/23	25/11/23	
28/11/2023		2nd		"	"	General form Circle		The circle be $25x^2+25y^2-30x-10y-6=0$ Find out the Radious	$x^2+y^2+2gx+2fy+c=0$ Radius is $\sqrt{g^2+f^2-c}$		28/11/23	28/11/23	
30/11/2023		3rd		"	"	Eqn of circle Satisfying Certain given Condn			Describe about Circle Satisfying Nature		30/11/23	30/11/23	
2/12/2023		4th		Coordinate Geometry in three Dimension		Three dimensional Rectangular Coordinates System			Distance Formula Three-dimensional Coordinate Describe		2/12/23	2/12/23	

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
4/12/2023	10th	1st	MATH-1	Coordinate Geometry in three Dimensions		Internal division Formula			Solved Internal division formula		4/12/23	4/12/23	
8/12/2023		2nd		"		Direction Ratio			$\frac{l}{a} = \frac{m}{b} = \frac{n}{c}$ (cosines)		08/12/23	08/12/23	
9/12/2023		3rd		"		Direction cosines in terms of direction ratios		Find the direction cosines of lines whose direction ratios are 1, 2, 3	$l = \frac{a}{\pm\sqrt{a^2+b^2+c^2}}$ $m = \frac{b}{\pm\sqrt{a^2+b^2+c^2}}$ $n = \frac{c}{\pm\sqrt{a^2+b^2+c^2}}$		9/12/23	9/12/23	
12/12/2023		4th				Angle between two lines have Slope m_1 & m_2		Line 1 - $y = 2x+3 \rightarrow m_1 = 2$ Line-2 $y = -\frac{1}{2}x \rightarrow m_2 = ?$	General form $a_1x + b_1y + c_1 = 0$ $a_2x + b_2y + c_2 = 0$		11/12/23	11/12/23	

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1	2	3	4	5	6	7	8
13/12/2023	11th	1st	MATH-1	Equation of a plane		• eqn of a sphere • Centre radius form • General form • Angle betn two planes	
18/12/2023		2nd		Sphere		a. eqn of a sphere (i) Centre radius form (ii) General form (iii) Two ends point of a diameter form	
19/12/2023		3rd		11		problem	
		4th					

Evaluative Questions	Expected learning outcome	Project work to be assigned	Signature of the Teacher	Signature of the Headmaster	Remarks
9	10	11	12	13	14
	Two plane Given $A_1x+B_1y+C_1z+D_1=0$ $A_2x+B_2y+C_2z+D_2=0$ $\cos\theta=\frac{A_1A_2+B_1B_2+C_2C_2}{\sqrt{A_1^2+B_1^2+C_1^2}\sqrt{A_2^2+B_2^2+C_2^2}}$		Checked 13/12/23	Checked 13/12/23	
• find the eqn of a sphere with center (2, -1, 4) & radius 5 • find the center & radius of the sphere -	formula discussed $(x-a)^2+(y-b)^2+(z-c)^2=r^2$ General form $x^2+y^2+z^2+2gx+2fy+2hz+c$		Checked 18/12/23	Checked 18/12/23	
Q - find the Centre & radius of the sphere $x^2+y^2+z^2-4x+6y-8z+9=0$	Diameter Edge points from formula		Checked 19/12/23	Checked 19/12/23	