ANNEXURE - I

ENGINEERING MATHEMATICS

(Common for all branches of Diploma in Engineering)

Unit-I:

Matrices:Matrices of 3rd order: Types of matrices-Algebra of matrices-Transpose of a matrix-Symmetric, skew symmetric matrices-Minor, cofactor of an element-Determinant of a square matrix-Properties-Laplace's expansion-singular and non singular matrices-Adjoint and multiplicative inverse of a square matrix-System of linear equations in 3 variables-Solutions by Crammer's rule, Matrix inversion method **.**

Partial Fractions: Resolving a given rational function into partial fractions.

Unit –II:

Trigonometry: Properties of Trigonometric functions – Ratios of Compound angles, multiple angles, sub multiple angles – Transformations of Products into sum or differenceand vice versa – Simple trigonometric equations – Properties of triangles – Inverse Trigonometric functions.

Complex Numbers: Modulus and conjugate, arithmetic operations on complex number— Modulus-Amplitude form (Polar form)-Euler form (exponential form)-Properties- De Movire's Theorem and its applications.

Unit – III : Analytical Geometry

Circles-Equation given center and radius-given ends of diameter-General equation-finding center and radius. Standard forms of equations of Parabola, Ellipse and Hyperbola – simple properties.

Unit – IV : Differentiation and its Applications

Functions and limits – Standard limits – Differentiation from the First Principles – Differentiation of sum, product, quotient of functions, function of function, trigonometric, inverse trigonometric, exponential, logarithmic, Hyperbolic functions, implicit, explicit and parametric functions – Derivative of a function with respect to another function-Second order derivatives –Geometrical applications of the derivative (angle between curves, tangent and normal) – Increasing and decreasing functions – Maxima and Minima (single variable functions) using second order derivative only – Derivative as rate measure -Errors and approximations - Partial Differentiation – Partial derivatives up to second order – Euler's theorem.

Unit – V : Integration and Its Applications

Indefinite Integral – Standard forms – Integration by decomposition of the integrand of trigonometric, algebraic, exponential, logarithmic and Hyperbolic functions – Integration by substitution – Integration of reducible and irreducible quadratic factors – Integration by parts – Definite Integrals and properties, Definite Integral as the limit of a sum – Application of Integration to find areas under plane curves and volumes of Solids of revolution – Mean and RMS value.

Unit – VI: Differential Equations

Definition of a differential equation-order and degree of a differential equation- formation of differential equations-solution of differential equation of the type first order, first degree, variable-separable, homogeneous equations, exact, linear differential equation of the form $dy/dx + Py = Q$, Bernoulli's equation, nth order linear differential equation with constant coefficients both homogeneous and non homogeneous and finding the Particular Integrals for the functions e^{ax}, x^m, *Sin ax, Cos ax.*

ANNEXURE - II
FOR DIPLOMA HOLDERS
MATHEMATICS (Common Syllabus)

Number of Questions to be Set Unit Wise (Total 50)

UNIT NO	TOPICS	MARKS
I	Matrices	05
	Partial Fractions	02
II	Trigonometry	10
	Complex numbers	02
III	Analytical geometry	06
IV	Differentiation and its applications	10
V	Integration and its applications	08
VI	Differential equations	07
TOTAL		50

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ANNEXURE - III
FOR DIPLOMA HOLDERS
MODEL QUESTIONS FOR MATHEMATICS

1. The maximum value of $5+8\cos\theta+6\sin\theta$ is

1) 25
2) 19
3) 15
4) 5

2. The value of $\cos10^0\cos50^0\cos70^0$ is

1) $\frac{\sqrt{3}}{4}$
2) $\frac{\sqrt{3}}{2}$
3) $\frac{\sqrt{3}}{6}$
4) $\frac{\sqrt{3}}{8}$

3. If $\sec2\theta = \frac{-2}{\sqrt{3}}$ then the general solution θ is

1) $2n\pi \pm \frac{5\pi}{6}$
2) $n\pi \pm \frac{5\pi}{6}$
3) $n\pi \pm \frac{5\pi}{12}$
4) $2n\pi \pm \frac{\pi}{6}$

4. The eccentricity of the ellipse $3x^2+2y^2=6$ is

1) $\frac{1}{3}$
2) $\frac{1}{\sqrt{3}}$
3) $\frac{1}{4}$
4) $\frac{1}{2}$

5. $\int_0^1 \frac{xe^x}{(1+x)^2}dx =$

1) $\frac{e-2}{2}$
2) e-2
3) $\frac{e-1}{2}$
4) e-1