## ANNEXURE I MATHEMATICS (Common Syllabus) FOR DIPLOMA HOLDERS

#### **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,-Gauss-Jordan methods.

**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 difference and 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.

## $\underline{\text{Unit} - V}$ : 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.

### <u>Unit – VI:</u> 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

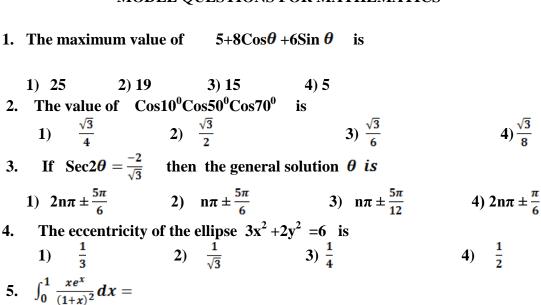
dy/dx + Py = Q, Bernoulli's equation, nth order linear differential equation with constant coefficients both homogeneous and non homogeneous and finding the Particular Integrals for the functions  $e^{ax}$ ,  $x^m$ ,  $Sin\ ax$ ,  $Cos\ ax$ .

## ANNEXURE II FOR DIPLOMA HOLDERS MATHEMATICS (Common Syllabus)

## **Number of Questions to be Set Unit Wise (TOTAL 50)**

UNIT NO	TOPICS	MARKS
Ι	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

# ANNEXURE III FOR DIPLOMA HOLDERS MODEL QUESTIONS FOR MATHEMATICS



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