SYLLABUS

1.2 APPLIED MATHEMATICS

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Section-A **(20%)**

DETAILED CONTENTS

1. Algebra **(30 Hrs)**

- Law of Indices, Formula of Factorisation and expansion i.e. $(a+b)^2$, (a^3+b^3) etc.
- Partial fraction:- Definition of Polynomial fraction proper & improper fractions and definition of partial fractions. To resolve proper fraction into partial fraction with denominator containing non-repeated linear factors, only.
- Complex numbers: definition of complex number, real and imaginary parts of a complex number, Polar and Cartesian Form and their inter conversion, Conjugate of a complex number, modulus and amplitude, addition subtraction, multiplication and division of complex number.
- Determinants and Matrices – Evaluation of determinants (up to 3 order) by laplace method. Solution of equations (up to 3 unknowns) by Cramer's Rule. Definition of Matrices and types, addition subtraction and multiplication of Matrices (up to 2 order).
- Permutation, combination formula, Values of ${}^nP_r$ and ${}^nC_r$.
- Binomial theorem for positive integral index , General term, simple problems

Section –B **(20%)**

2. Trigonometry **(14 Hrs)**

- Concept of angle: measurement of angle in degrees, grades, radians and their conversions.
- T-Ratios of standard angle (0^0,30^0,45^0etc) and fundamental Identities, Allied angles (without proof) Sum, Difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa)
- Applications of Trigonometric terms in engineering problems such as to find an angle of elevation, height, distance etc.

3. Co-ordinate Geometry **(12 Hrs)**

- Point: Distance Formula, Mid Point Formula, Centroid of triangle and area of triangle.

- Straight line: Slope of a line, equation of straight line in various standards forms (without proof); (slope intercept form, intercept form, one-point form, two-point form, normal form, general form), angle between two straight lines.

- Circle: General equation of a circle and identification of centre and radius of circle. To find the equation of a circle, given:
  * Centre and radius
  * Coordinates of end points of a diameter

Section –C **(60%)**

4. Differential Calculus **(40 Hrs)**

- Definition of function; Concept of limits (Introduction only) and problems related to four standard limits only.

- Differentiation of standard function (Only formulas), Differentiation of Algebraic function, Trigonometric functions, Exponential function, Logarithmic function

- Differentiation of sum, product and quotient of functions.

- Successive differentiation (up to 2nd order)

- Application of differential calculus in:

  (a) Rate measures
  (b) Maxima and minima

5. Integral Calculus **(28 Hrs)**

- Integration as inverse operation of differentiation with simple exs.

- Simple standard integrals, Integrations by parts and related Simple problems

- Evaluation of definite integrals with given limits.

  Evaluation of $\int_0^{\frac{\pi}{2}} sin^n x\, dx$, $\int_0^{\frac{\pi}{2}} cos^n x\, dx$, $\int_0^{\frac{\pi}{2}} sin^m x\, cos^n x\, dx$

  using formulae without proof (m and n being positive integers only) using pre-existing mathematical models.

- Applications of integration: for evaluation of area under a curve and axes (Simple problems where the limits are given).

- Numerical integration by Trapezoidal Rule and Simpson's $1/3^{rd}$ Rule using pre-existing mathematical models

6. Differential Equations (04 Hrs)

Definition, order, degree and linearity, of an ordinary differential equation. Solution of I^{st} order and I^{st} degree differential equation by variable separable method (Simple problems)

7. Statistics (12 Hrs)

- Measures of Central Tendency: Mean, Median, Mode
- Measures of Dispersion: Mean deviation from mean, Standard deviation
- Correlation coefficient and Coefficient of rank correlation (Simple problems)

DISTRIBUTION OF SYLLABUS FOR ASSESSMENTS & DISTRIBUTION OF MARKS

Section	**Assessment**	**Units to be covered**		**Distribution of Marks**
A	1st Internal	Unit 1:	Algebra	20
B	2nd Internal	Unit 2:	Trigonometry	10
		Unit 3:	Coordinate Geometry	10
C	Final	Unit 4	Differential Calculas	20
		Unit 5	Integral Calculas	16
		Unit 6	Differential equations	8
		Unit 7	Statistics	16