

UNIT I

Chapter 1 : Matrices 1-1 to 1-53

Syllabus :

- 1.1 Concept of Matrix
- 1.2 Types of Matrices
- 1.3 Addition, Subtraction and multiplication by scalar of matrices
- 1.4 Product of two matrices
- 1.5 Adjoint and Inverse of a matrix of order 2X2 and 3X3.
- 1.6 Solution of Simultaneous linear equations of two variables.

1.1	Introduction	1-1
1.2	Definition	1-1
1.3	Comparison between Determinant and Matrix	1-2
1.4	Types of Matrices	1-2
1.5	Algebra of Matrices	1-6
1.5.1	Addition	1-6
1.5.2	Subtraction	1-6
1.5.3	Equality of Matrices	1-7
1.5.4	Multiplication of Matrices	1-7
1.5.5	Illustrative Examples	1-9
1.5.6	Examples Based on Multiplication of Matrices	1-13
1.5.7	Transpose of a Matrix	1-25
1.5.8	Orthogonal Matrix	1-26
1.5.9	Determinant of a Matrix	1-32
1.5.10	Minor of an Element	1-35

1.5.11	Cofactor of an Element	1-35
1.5.12	Adjoint of a Matrix	1-35
1.5.13	Solved Examples	1-36
1.5.14	Inverse of a Matrix by Adjoint Method	1-38
1.6	Solution of Simultaneous Equations by Matrix Inversion Method	1-43
1.7	Steps to Solve the System	1-44

UNIT II

Chapter 2 : Derivatives 2-1 to 2-57

Syllabus :

- 2.1 Concept and Definition of Differentiation
- 2.2 Working rules: Sum, Product, Division
- 2.3 Chain Rule
- 2.4 Derivative of Implicit functions
- 2.5 Derivative of Parametric functions
- 2.6 Logarithmic Differentiation
- 2.7 Successive Differentiation up to second order
- 2.8 Applications : Velocity, Acceleration, Maxima & Minima of given simple functions.

2.1	Introduction	2-1
2.2	Definition of Derivative	2-1
2.3	Geometrical Meaning of Derivatives.....	2-2
2.4	Derivatives of Standard Functions	2-2
2.4.1	Constant Function.....	2-2
2.4.2	Power Function.....	2-2
2.4.3	Exponential Function	2-3
2.4.4	Logarithmic Function.....	2-3

2.4.5 Trigonometric Functions By using First Principle..... 2-4

2.4.6 Derivatives of Inverse Trigonometric Functions..... 2-6

2.5 Derivatives of Some Standard Functions..... 2-8

2.6 Rules of Differentiation 2-9

2.6.1 Derivative of Sum..... 2-9

2.6.2 Derivative of Difference 2-9

2.6.3 Examples 2-9

2.6.4 Derivative of Product..... 2-12

2.6.5 Derivative of Quotient 2-14

2.6.6 Derivatives of a Composite Functions (Chain Rule) 2-16

2.7 Composite Derivatives..... 2-17

2.8 Derivatives of Inverse Functions..... 2-21

2.9 Derivatives of Inverse Trigonometric Functions by Suitable Substitution 2-22

2.10 Derivatives of Implicit Functions 2-24

2.11 Logarithmic Differentiation..... 2-27

2.12 Derivatives of Parametric Functions..... 2-31

2.13 Derivative of One Function with respect to another Function 2-36

2.14 Successive Differentiation Second Order Differentiation 2-37

2.15 Application of Derivative : 2-42

2.16 Maxima and Minima 2-45

UNIT III

Chapter 3 : Definite Integraton 3-1 to 3-92

Syllabus :

- 3.1 Concept and Definition of Integration.
- 3.2 Working rules and Integral of standard functions.
- 3.3 Method of substitution.
- 3.4 Integration by parts.
- 3.5 Definite Integral and its properties.
- 3.6 Applications: Area and volume. (Simple problems)

3.1 Integration 3-1

3.1.1 Indefinite Integral..... 3-1

3.1.2 Integration of Standard Function..... 3-1

3.2 Rules of Integration 3-2

3.3 Solved Examples on Simple Integration 3-2

3.4 Integration of Composite Function..... 3-7

3.5 Integrals of Simple Algebraic Rational Functions 3-8

3.6 Integration by Trigonometric Transformation.. 3-9

3.7 Integration by Substitution Method..... 3-15

3.7.1 Some Substitutions..... 3-16

3.8 Solved Examples 3-16

3.9 Integral of the Form..... 3-24

3.9.1 Solved Example..... 3-24

3.10 Integration by Partial Fraction..... 3-26

3.11 Integral of the Form..... 3-31

3.11.1 Examples 3-31

3.12 Integrals of the Form..... 3-33

3.12.1 Integrals of the Form..... 3-33

3.13 Integration by Parts..... 3-36

3.14 Definite Integral..... 3-41

3.15 Some Properties of Definite Integral 3-41

3.15.1 Examples 3-42

3.16 Problems on Property of Definite Integration..... 3-50

3.17 Definite Integral by Method of Substitution..... 3-59

3.18 Integration by Parts..... 3-67

3.18.1 Examples 3-67

3.19 Introduction..... 3-69

3.20 Area under the Curve as a Definite Integral... 3-71

3.20.1 Examples 3-71

3.21 Area between Two Curves..... 3-79

3.21.1 Examples 3-79

3.22 Volume of a Solid of Revolution 3-84

3.22.1 Examples 3-84

UNIT IV

Chapter 4 : Differential Equations 4-1 to 4-29

Syllabus :

4.1 Concept and Definition, Order and Degree of differential Equation.

4.2 Solution of DE of first degree and first order by Variable Separable method.

4.3 Solution of linear Differential Equation.

4.1 Introduction 4-1

4.2 Solved Examples 4-1

4.3 Solution of Differential Equations of First Order and First Degree 4-6

4.4 Examples..... 4-6

4.5 Equation Reducible to Variable Separable Form4-13

4.6 Solved Examples4-13

4.7 Solution of Linear Differential Equation4-14

UNIT V

Chapter 5 : Statistics 5-1 to 5-20

Syllabus :

5.1 Mean for ungrouped and grouped data.

5.2 Mean deviation and Standard deviation about Mean for ungrouped and grouped data.

5.1 Introduction 5-1

5.2 Sources of Data..... 5-1

5.2.1 Primary Data 5-1

5.2.2 Secondary Data 5-1

5.2.3 Objects of Classification 5-1

5.3 Types of Classification 5-1

5.3.1 Quantitative Classification 5-1

5.3.2 Qualitative Classification 5-2

5.3.3 Variable..... 5-2

5.3.4 Discrete Variable 5-2

5.3.5 Continuous Variable 5-2

5.4 Frequency Distribution..... 5-2

5.4.1 Discrete Frequency Distribution 5-2

5.4.2	Continuous and Discontinuous Grouped Frequency Distribution	5-2	5.6.4	Standard Deviation (S.D.)	5-12
5.5	Measures of Central Tendency	5-3	5.6.5	Variance (σ^2)	5-12
5.6	Mean (Arithmetic Mean)	5-3	5.6.6	Coefficient Standard Deviation	5-12
5.6.1	Mean of Ungrouped Data :	5-3	5.6.7	Coefficient of Variation	5-12
5.6.2	Mean of Grouped Data :	5-6			
5.6.3	Mean deviation for ungrouped data	5-9			