

# Lesson Plan of Paper : Algebra and Number Theory

Session: 2023-24.

Name of Teacher: ANUP SINGH

Class: BSc. /BA 1<sup>st</sup> year Sem. 2<sup>nd</sup>

Week	Topics
Week 1	Matrices and their types Examples based on matrices Symmetric matrices and their theorem Skew symmetric matrices and their theorem Theorems based on above method
Week 2	Orthogonal and unitary matrix Theorems based on above method Rank of a matrix Row rank and column rank Examples based on rank method
Week 3	Normal form of a matrix Problems based on above method Reduction of matrix into row echelon form Inverse of a matrix using elementary operations Examples based on above method
Week 4	Linear dependence and independence of row and column matrices Theorem related to linear independent and linear dependent Characteristic equation of a matrix Theorems based on above method Linear dependence and independence of row and column matrices
Week 5	Eigen values and eigen vectors of a matrix Cayley Hamilton theorem Problem based on this theorem Inverse of a matrix using Cayley Hamilton theorem Eigen values and eigen vectors of a matrix
Week 6	Minimal and characteristic polynomial Theorems Derogatory matrices. Derogatory matrices Examples based on these topics
Week 7	Relation between roots and coefficients of an equation Synthetic division method Problems and examples on above method Fundamental theorem of algebra Theorems and examples based on above problem
Week 8	Problems and examples on root of an equation

Lesson  
 Name  
 Class  
 Week

	Results on non root Problems on common root Assignment
<b>Week 9</b>	
	Transformation of Equations Roots with changed, roots multiplied by a given number and reciprocal roots Problems on above method Roots divided by a given number Transformation of Equations
<b>Week 10</b>	
	Problems based on above method Transformation of equations in general Equation of the difference of a cubic Descartes rule of sign Results on Descartes rule of sign Problems on results
<b>Week 11</b>	
	Linear Congruences Examples Fermat's theorem Examples Euler's theorem
<b>Week 12</b>	
	Examples based on Euler's and Wilson's theorem Test Linear Diophantine equations in two variables Complete residue system, Reduced residue system modulo m Examples. Assignment
<b>Week 13</b>	
	Query Revision

**Lesson Plan of : Real and Complex**

**Name of Teacher: ANUP SINGH**

**Class: B.A./B.Sc. 3rd year 6th Sem.**

**Session: 2023-2024**

Week	Topics
<b>Week 1</b>	Discussion about exam pattern. Review chapter. Jacobians Beta and Gama functions Examples.
<b>Week 2</b>	Double and Triple integrals Dirichlets integrals Examples.
<b>Week 3</b>	change of order of integration in double integrals. Fourier's series Examples. Test.
<b>Week 4</b>	Dirichlet's conditions Parseval's identity for Fourier series Examples. Assignment-1
<b>Week 5</b>	Fourier series for even and odd functions Examples.
<b>Week 6</b>	Half range series, Change of Intervais. Examples. Test
<b>Week 7</b>	Extended Complex Plane Stereographic projection of complex numbers Examples.
<b>Week 8</b>	continuity and differentiability of complex functions Analytic functions Examples.
<b>Week 9</b>	Cauchy-Riemann equations. Examples. Harmonic functions Examples. Test

<b>Week 10</b>	
	Mappings by elementary functions
	Conformal Mappings
	Assignment-2
	Examples.
<b>Week 11</b>	
	Fixed points
	Cross ratio
	Examples.
<b>Week 12</b>	
	Inverse Points
	critical mappings
	Examples.
<b>Week 13</b>	
	Query

**Lesson Plan of : Mathematics for Commerce and Social Sciences**

**Name of Teacher: Mr. Anup singh**

**Class: B.A 1st year 2nd Sem.**

<b>Week 1</b>	
	Matrices and Determinants: Definition of a matrix
	Order, Equality, Types of matrices,
	Operations on matrices: addition
	Multiplication
	Examples.
<b>Week 2</b>	
	Multiplication with a scalar and their simple properties.
	Examples.
<b>Week 3</b>	
	Minors, Co-factors, Determinant
	Properties of determinants and applications of determinants in finding the area of a triangle,
	Test.
<b>Week 4</b>	
	Differentiation
	Derivatives of simple functions and other functions having applications in business and social studies,
	Assignment
<b>Week 5</b>	
	Maxima and minima of a function and their applications to Revenue, Cost, Demand, Production
	Profit functions and other functions related to commercial and social Problems.
	Examples.
<b>Week 6</b>	
	Integration of simple functions and its applications in commercial and economic problems.
	Examples.
	Test
<b>Week 7</b>	
	Simple interest and compound interest.
	Examples.

<b>Week 8</b>	
	Annuities: Types of annuities
	Present value and amount of an annuity (including the case of continuous compounding)
	Examples.
<b>Week 9</b>	
	Valuation of simple loans and debentures
	Problems related to sinking funds.
	Examples.
	Test
<b>Week 10</b>	
	Linear Programming: Formulation of linear programming problems (LPP)
	Assignment
	Examples.
<b>Week 11</b>	
	Linear Programming: their solution by graphical and Simplex methods.
	Examples.
<b>Week 12</b>	
	Applications of linear programming in solving social science and business problems.
	Examples.

# Lesson Plan of : Numerical Ability

## Enhancement Skills

Name of Teacher: Mr. Anup singh

Class: B.A 1st year 2nd Sem.

<b>Week 1</b>	
	Real number system, Examples.
<b>Week 2</b>	
	Operations on numbers, Tests for divisibility of natural numbers Examples.
<b>Week 3</b>	
	Decimals, Fractions Square roots, Cube roots Test.
<b>Week 4</b>	
	Surds and indices Use of BODMAS. HCF LCM of integers Assignment
<b>Week 5</b>	
	Ratio and Proportion, Progressions: Arithmetic Progression, Geometric Progression Examples. Test
<b>Week 6</b>	
	Harmonic Progression with their simple and basic practical applications Number series completion Test
<b>Week 7</b>	
	Annuities: Types of annuities Present value and amount of an annuity (including the case of continuous compounding) Examples.
<b>Week 8</b>	
	Percentage Examples. Test
<b>Week 9</b>	
	Profit & Loss, Alligation or mixture

	Examples.
	Test
<b>Week 10</b>	
	Average, Average speed problems, Calendar.
	Assignment
	Examples.
<b>Week 11</b>	
	Logarithms, Area of Quadrilaterals ( Parallelogram, Square, Rectangle, Rhombus, Trapezium)
	Examples.
<b>Week 12</b>	
	Volume and surface area of Cube, Cuboid, Cylinder, Cone, Sphere and Hemisphere.
	Examples.