GOVERNMENT COLLEGE CHHACHHRAULI (LESSON PLAN- 2022-23)

Dr. Indu Bala   **Class:- B.A./B.Sc. I (Ist Sem.)**

Paper:- Algebra

Sr. No.	Period	Topics
1.	Sept 2022	Relations between the roots and coefficients of general polynomial equation in one variable. Solutions of polynomial equations having conditions on roots. Common roots and multiple roots. Transformation of equations. Assignment I
2.	Oct. 2022	Nature of the roots of an equation Descarte's rule of signs. Solutions of cubic equations (Cardon's method). Biquadratic equations and their solutions. Class Test
3.	Nov. 2022	Symmetric, Skew symmetr ic, Hermitian and skew Hermitian matrices. Elementar y Operations on matrices. Rank of a matrices. Inverse of a matrix. Linear dependence and independence of rows and columns of matrices. Row rank and column rank of a matrix. Eigenvalues, eigenvectors and the characteristic equation of a matrix. Minimal polynomial of a matrix. Cayley Hamilton theorem and its use in finding the inverse of a matrix. Assignment II
4.	Dec. 2022	Applications of matrices to a system of linear (both homogeneous and non– homogeneous) equations. Theorems on consistency of a system of linear equations. Unitary and Orthogonal Matrices, Bilinear and Quadratic forms.

GOVERNMENT COLLEGE CHHACHHRAULI (LESSON PLAN- 2022-23)

Dr. Indu Bala   **Class:- B.A./B.Sc. II (IIIrd Sem.)**

Paper:- Advanced Calculus

Sr. No.	Period	Topics
1.	Sept 2022	Limit and continuity of real valued functions of two variables. Partial differentiation. Total Differentials; Composite functions & implicit functions. Change of variables. Homogenous functions & Euler's theorem on homogeneous functions. Taylor's theorem for functions of two variables. Assignment I
2.	Oct 2022	Differentiability of real valued functions of two variables. Schwarz and Young's theorem. Implicit function theorem. Maxima, Minima and saddle points of two variables. Lagrange's method of multipliers. Class Test
3.	Nov 2022	Continuity, Sequential Continuity, properties of continuous functions, Uniform continuity, chain rule of differentiability. Mean value theorems; Rolle's Theorem and Lagrange's mean value theorem and their geometrical interpretations. Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives, Indeterminate forms. Assignment II
4.	Dec 2022	Curves: Tangents, Principal normals, Binormals, Serret-Frenet formulae. Locus of the centre of curvature, Spherical curvature, Locus of centre of Spherical curvature, Involutes, evolutes, Bertrand Curves. Surfaces: Tangent planes, one parameter family of surfaces, Envelopes.

GOVERNMENT COLLEGE CHHACHHRAULI (LESSON PLAN- 2022-23)

Dr. Indu Bala   **Class:- B.A./B.Sc. III (Vth Sem.)**

Paper:- Real Analysis

Sr. No.	Period	Topics
1.	Sept 2022	Riemann integral, Integrabililty of continuous and monotonic functions, The Fundamental theorem of integral calculus. Mean value theorems of integral calculus. Assignment I
2.	Oct. 2022	Improper integrals and their convergence, Comparison tests, Abel's and Dirichlet's tests, Frullani's integral, Integral as a function of a parameter. Continuity, Differentiability and integrability of an integral of a function of a parameter. Class Test
3.	Nov. 2022	Definition and examples of metric spaces, neighborhoods, limit points, interior points, open and closed sets, closure and interior, boundary points, subspace of a metric space, equivalent metrics, Cauchy sequences, completeness, Cantor's intersection theorem, Baire's category theorem, contraction Principle Assignment II
4.	Dec. 2022	Continuous functions, uniform continuity, compactness for metric spaces, sequential compactness, Bolzano-Weierstrass property, total boundedness, finite intersection property, continuity in relation with compactness, connectedness , components, continuity in relation with connectedness.

GOVERNMENT COLLEGE CHHACHHRAULI (LESSON PLAN- 2022-23)

Dr. Indu Bala   **Class:- B.C.A. I (Ist Sem.)**

Paper:- Elements of Mathematical Foundations-I

Sr. No.	Period	Topics
1.	Sept 2022	Set, Subset and operations on sets, Venn diagram of sets. Power set of a set, Equivalence relation on a set and partition of a set, Permutation and combinations, Partially ordered sets, Lattices (definition & examples), Boolean algebra (definition & examples). Assignment I
2.	Oct. 2022	Epsilon and delta definition of the continuity of a function of a single variable, Basic properties of limits, Continuous functions and classifications of discontinuities, Derivative of a function, Derivatives of logarithmic, exponential, trigonometric, inverse trigonometrical and hyperbolic functions. Higher order derivatives. Class Test
3.	Nov. 2022	Formation of differential equations, order and degree of the differential equation, Geometrical approach to the existence of the solution of the differential equation $dy / dx = f(x, y)$. Ordinary differential equations of first degree and the first order, exact differential equations. Assignment II
4.	Dec. 2022	Linear differential equations of higher order with constant coefficients, Homogeneous linear differential equations and linear differential equations reducible to homogeneous differential equations. Applications of differential equations to geometry.