Lesson Plan (2022-23)
ODD SEMESTERS

Name of Teaching Faculty: AJAY KUMAR

Subject: Mathematics Class : B.Sc. III/B.A. III Paper: Groups and Rings

Week	Date	Topics
Week 1	16/08/2022 to 21/08/2022	Introduction to groups
Week 2	22/08/2022 to 28/08/2022	Definition of a group with example and simple properties of groups , Subgroups and Subgroup criteria,Problem Discussion
Week 3	29/08/2022 to 04/09/2022	Generation of groups, cyclic groups, Cosets,Problem Discussion
Week 4	05/09/2022 to 11/09/2022	Left and right cosets, Index of a subgroup. Coset decomposition, Lagrange's theorem and its consequences, Normal subgroups, Quotient groups.
Week 5	12/09/2022 to 18/09/2022	Coset decomposition, Lagrange's theorem and its consequences,Problem Discussion,
Week 6	19/09/2022 to 25/09/2022	Homomorphism,isomorphisms, automorphisms and inner automorphisms of a group. Automorphisms of cyclic groups. Permutation groups. Even and odd permutations, Alternating groups,Problem Discussion
Week 7	26/09/2022 to 02/10/2022	Cayley's theorem, Centre of a group and derived group of a group. Introduction to rings,Problem Discussion
Week 8	03/10/2022 to 09/10/2022	Introduction to subrings, integral domains and fields, Characteristics of a ring, Problem Discussion
Week 9	10/10/2022 to 16/10/2022	Ring homomorphisms, ideals principle, prime and Maximal.Problem Discussion
Week 10	17/10/2022 to 23/10/2022	Quotient rings, Field of quotients of an integral domain.Problem Discussion
Week 11	24/10/2022 to 30/10/2022	Euclidean rings
Week 12	31/10/2022 to 06/11/2022	Euclidean rings
Week 13	07/11/2022 to 13/11/2022	Polynomial rings, Polynomials over the rational field. The Eisenstein's criterion of irreducibility.
Week 14	14/11/2022 to 20/11/2022	Polynomial rings over commutative rings. Unique factorization domain.

Week 15	21/11/2022 to 27/11/2022	R unique factorization domain implies so is R (X,, XX)
Week 16	28/11/2022 to 04/12/2022	Revision and problem solving

Name of Teaching Faculty: AJAY KUMAR

Subject: Mathematics Class :B.A.II\ B.Sc. II Paper: Advanced Calculus

Week	Date	Topics
Week 1	16/08/2022 to 21/08/2022	Introduction toContinuity
Week 2	22/08/2022 to 28/08/2022	Continuity, Sequential Continuity, properties of continuous functions, Uniform continuity,Problem discussion
Week 3	29/08/2022 to 04/09/2022	Uniform continuity,chain rule of differentiability,Problem discussion
Week 4	05/09/2022 to 11/09/2022	Mean value theorems; Rolle's Theorem and Lagrange's mean value theorem and their geometrical interpretations. ,Problem discussion
Week 5	12/09/2022 to 18/09/2022	Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives,Problem discussion
Week 6	19/09/2022 to 25/09/2022	Indeterminate forms, Limit and continuity of real valued functions two variables. Partial differentiation. Total Differentials,Problem discussion
Week 7	26/09/2022 to 02/10/2022	two variables. Partial differentiation. Total Differentials,Composite functions & implicit function,Change of variables,Problem discussion
Week 8	03/10/2022 to 09/10/2022	Homogenous functions & Euler's theorem on homogeneous functions. Taylor's theorem for functions of two variables,Problem discussion
Week 9	10/10/2022 to 16/10/2022	Differentiability of real valued functions of two variables,Problem discussion
Week 10	17/10/2022 to 23/10/2022	Schwarz and Young's theorems. Implicit function theorem. Maxima, Minima and saddle points of two variables. Lagrange's method of multipliers,Problem discussion
Week 11	24/10/2022 to 30/10/2022	Diwali Vacation and preparation,Maxima, Minima and saddle points of two variables,Problem discussion
Week 12	31/10/2022 to 06/11/2022	Lagrange's method of multipliers,jacobians,Problem discussion
Week 13	07/11/2022 to 13/11/2022	Beta and Gama functions,Problem discussion
Week 14	14/11/2022 to 20/11/2022	Double and Triple integrals, Dirichlets integralschange of order of integration in double integrals,Problem discussion

Week 15	21/11/2022 to 27/11/2022	change of order of integration in double integrals,Revision and Problem discussion
Week 16	28/11/2022 to 04/12/2022	Revision and Problem discussion

Name of Teaching Faculty: AJAY KUMAR

Subject: Mathematics Class : B.A. III/B.Sc.-III Paper:- Number Theory and Trigonometry

Week	Date	Topics
Week 1	16/08/2022 to 21/08/2022	Circular Functions of a complex variable.
Week 2	22/08/2022 to 28/08/2022	Expansion of Cos z and Sinz.
Week 3	29/08/2022 to 04/09/2022	Trigonometrical formulaes of circular functions.
Week 4	05/09/2022 to 11/09/2022	Hyperbolic Functions.
Week 5	12/09/2022 to 18/09/2022	Formulaes of Hyperbolic Functions.
Week 6	19/09/2022 to 25/09/2022	Inverse circular and hyperbolic functions.
Week 7	26/09/2022 to 02/10/2022	Logarithms of a complex quantity.
Week 8	03/10/2022 to 09/10/2022	Gregaroy series.
Week 9	10/10/2022 to 16/10/2022	Principal Value and General values.
Week 10	17/10/2022 to 23/10/2022	Series of Sines and Cosines of angles which are in A.P.
Week 11	24/10/2022 to 30/10/2022	Diwali Vacation & Introduction to summation of series .
Week 12	31/10/2022 to 06/11/2022	Congurences and Linear Diophantine Equations.
Week 13	07/11/2022 to 13/11/2022	Fermat's, Wilson's and Chinese Remaindor Theorms.
Week 14	14/11/2022 to 20/11/2022	Solved examples of all these theorms.
Week 15	21/11/2022 to 27/11/2022	Simultaneous Linear Congurences.
Week 16	28/11/2022 to 04/12/2022	Revision and Problem Solving.

Name of Teaching Faculty: AJAY KUMAR

Subject: Mathematics Class : B.Com. Ist Paper:- Business Mathematics

Week	Date	Topics
Week 1	16/08/2022 to 21/08/2022	Matrices and Determinants: concept of matrix, types, and algebra of matrices
Week 2	22/08/2022 to 28/08/2022	Properties of determinants; calculation of values of determinants up to third order,
Week 3	29/08/2022 to 04/09/2022	Adjoint of a matrix, elementary row or column Operations.
Week 4	05/09/2022 to 11/09/2022	Finding inverse of a matrix through adjoint.
Week 5	12/09/2022 to 18/09/2022	Elementary row or column operations; Solution of a system of linear equations having unique.
Week 6	19/09/2022 to 25/09/2022	Solution Involving not more than three variables.
Week 7	26/09/2022 to 02/10/2022	Compound Interest.
Week 8	03/10/2022 to 09/10/2022	Numerical of Compound Interest.
Week 9	10/10/2022 to 16/10/2022	Introduction of Logarithms, Logarithms, Anti-logarithms
Week 10	17/10/2022 to 23/10/2022	Introduction of Differentiation and their questions.
Week 11	24/10/2022 to 30/10/2022	Simple derivative of different functions Rules of differentiation (simple standard forms).
Week 12	31/10/2022 to 06/11/2022	Differentiation of Logarathmic and Exponential functions.
Week 13	07/11/2022 to 13/11/2022	Differentiation of Implicit functions.
Week 14	14/11/2022 to 20/11/2022	Maxima and Minima of functions of one variable.
Week 15	21/11/2022 to 27/11/2022	Test of Ist and 2nd unit.
Week 16	28/11/2022 to 04/12/2022	Revision and Problem Solving.

Name of Teaching Faculty: AJAY KUMAR

Subject: Mathematics Class : B.A. II/ B.Sc. II Paper: Numerical Analysis

Week	Date	Topics
Week 1	16/08/2022 to 21/08/2022	Finite Difference operators and their relations, difference table, finding the missing terms and effect of error in a difference tabular values
Week 2	22/08/2022 to 28/08/2022	Interpolation with equal intervals: derivations of Newton's forward and Newton's backward interpolation formulae and their applications
Week 3	29/08/2022 to 04/09/2022	Interpolation with unequal intervals: derivations of Newton's divided difference & Lagrange's Interpolation formulae and their applications.
Week 4	05/09/2022 to 11/09/2022	Central Difference interpolation formulae: derivations of Gauss's forward and Gauss's backward interpolation formulae, Sterling,Bessel formulae and their applications. Numerical Differentiation: Relation between difference operator and derivative operator
Week 5	12/09/2022 to 18/09/2022	Derivative of a function using interpolation formulae (as studied in Sections – I & II). Numerical Integration: Newton-Cote's Quadrature formula,
Week 6	19/09/2022 to 25/09/2022	Trapezoidal rule, Simpson's one- third rule and Simpson's three-eighth rule, Chebychev formula, Gauss Quadrature formula.
Week 7	26/09/2022 to 02/10/2022	Solution of Algebraic and Transcendental equations: Bisection method, Regula-Falsi method, Secant method, Newton-Raphson's method, Newton's iterative method for finding pth root of a number.
Week 8	03/10/2022 to 09/10/2022	Simultaneous linear algebraic equations: Gauss-elimination method, Gauss-Jordan method, Triangularization method (LU decomposition method).
Week 9	10/10/2022 to 16/10/2022	Iterative method, Jacobi's method, Gauss-Seidal's method, Relaxation method.
Week 10	17/10/2022 to 23/10/2022	Eigen Value Problems: Power method, Jacobi's method, Given's method, House-Holder's method.
Week 11	24/10/2022 to 30/10/2022	Numerical solution of ordinary differential equations: Single step methods-Picard's method. Taylor's series method, Euler's method
Week 12	31/10/2022 to 06/11/2022	Modified Euler's method, Runge-Kutta Methods.
Week 13	07/11/2022 to 13/11/2022	Multiple step methods; Predictor-corrector method, Milne-Simpson's method
Week 14	14/11/2022 to 20/11/2022	Revision and problem solving.
Week 15	21/11/2022 to 27/11/2022	Revision and problem solving
Week 16	28/11/2022 to 04/12/2022	Revision and problem solving

Name of Teaching Faculty: AJAY KUMAR

Subject: Mathematics Class :B.A. I\ B.Sc. I Paper: Algebra

Week	Date	Topics
Week 1	05/09/2022 to 11/09/2022	Introduction to Matrices, Inverse of matrix
Week 2	12/09/2022 to 18/09/2022	Symmetric, Skew-Symmetric, Hermitian and Skew-Hermitian matrics. Rank of a matrix.
Week 3	19/09/2022 to 25/09/2022	Row rank and column rank of a matrix. Eigen values, eigen vectors
Week 4	26/09/2022 to 02/10/2022	characteristic equations of a matrix, Minimal polynomial of a matrix.Cayley Hamilton theorem
Week 5	03/10/2022 to 09/10/2022	Applications of matrices to a system of linear(both homogeneous and non-homogenous) equations.
Week 6	10/10/2022 to 16/10/2022	Theorems of consistency of a system of linear equations.Unitary and Orthogonal Matrices, Bilinear Form and Quadratic Form
Week 7	17/10/2022 to 23/10/2022	Canonical form of a bilinear form. Matrix notation of bilinear and quadratic Form
Week 8	24/10/2022 to 30/10/2022	Relations between the roots and coefficients of general polynomial equation in one variable.
Week 9	31/10/2022 to 06/11/2022	Solutions of polynomial equations having conditions on roots.Common roots and multiple roots. Transformation of equations.
Week 10	07/11/2022 to 13/11/2022	Nature of roots of an equation, Solutions of cubic equations by Cardan's Method
Week 11	14/11/2022 to 20/11/2022	Biquadratic equations and their solutions Discarte' Method and Ferarri Method.
Week 12	21/11/2022 to 27/11/2022	Descarte's rule of signs for polynomial
Week 13	28/11/2022 to 04/12/2022	Revision and Problem discussion

Name of Teaching Faculty: AJAY KUMAR

Subject: Mathematics Class :B.A. I\ B.Sc. I Paper: Calculus

Week	Date	Topics
Week 1	05/09/22-11/09/22	Limit , Continuity and Differntiability,
Week 2	12/09/22-18/09/22	Succeesive Differentiation
Week 3	19/09/22-25/09/22	General Theorem on Exapnsion
Week 4	26/09/22-02/10/22	Asymptotes,
Week 5	03/10/22-09/10/22	Singular Points
Week 6	10/10/22-16/10/22	Curve Tracing
Week 7	17/10/22-23/10/22	Reduction formulae
Week 8	24/10/22-30/10/22	Rectification
Week 9	31/10/22-06/11/22	Quadrature
Week 10	07/11/22-13/11/22	CURVATURE
Week 11	14/11/22-20/11/22	Volume and Area of Solid of revolution
Week 12	21/11/22-27/11/22	Volume and Area of Solid of revolution
Week 13	28/11/22-04/12/22	Revision and tests

Name of Teaching Faculty: AJAY KUMAR

Subject: Mathematics Class : B.Sc. III/B.A. III Paper: Sequence and series

Week	Date	Topics
Week 1	16/08/2022 to 21/08/2022	Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set
Week 2	22/08/2022 to 28/08/2022	Neighborhoods, interior points, isolated points, limit points, Open sets, closed set, interior of a set, closure of a set in real numbers and their properties
Week 3	29/08/2022 to 04/09/2022	Sequence: Real sequences and their convergence, theorem on limits of sequence, bounded and monotonic sequences.
Week 4	05/09/2022 to 11/09/2022	Cauchy's sequence, Cauchy general principle of convergence, subsequences, subs sequential limits.
Week 5	12/09/2022 to 18/09/2022	Infinite series: Convergence and divergence of Infinite Series, Comparison Tests of positive terms Infinite series ,Cauchy's general principle of Convergence of series.
Week 6	19/09/2022 to 25/09/2022	Convergence and divergence of geometric series, Hyper Harmonic series or p-series. D-Alembert's ratio test.
Week 7	26/09/2022 to 02/10/2022	Fourier's series: Fourier expansion of piecewise monotonic functions, Properties of Fourier Coefficients, Dirichlet's conditions
Week 8	03/10/2022 to 09/10/2022	Parseval's identity for Fourier series, Fourier series for even and odd functions, Half range series
Week 9	10/10/2022 to 16/10/2022	Change of Intervals. Riemann integral: Definition and examples.
Week 10	17/10/2022 to 23/10/2022	Integrabililty of continuous, monotonic functions and discontinuous functions.
Week 11	24/10/2022 to 30/10/2022	Properties of integrable functions. Continuity and differentiability of integrable functions.
Week 12	31/10/2022 to 06/11/2022	Primitive. The Fundamental theorem of integral calculus, Mean value theorems of integral calculus
Week 13	07/11/2022 to 13/11/2022	Revision and problem solving
Week 14	14/11/2022 to 20/11/2022	Revision and problem solving

Week 15	21/11/2022 to 27/11/2022	Revision and problem solving
Week 16	28/11/2022 to 04/12/2022	Revision and problem solving