

K.T.S.P.Mandal's
Hutatma Rajguru Mahavidyalaya, Rajgurunagar
Department Of Mathematics
Teaching Plan
Academic Year-2023-24
Sem-I

Sr. No.	Class	Subject	Name of Teacher
1	F.Y.B.Sc.	Algebra	Prof. Toke R.N.
		Calculus-I	Prof. Wayal R. M.
2	S.Y.B.Sc.	Calculus of Several Variable	Prof. Wayal R.M.
		Numerical Analysis & its application	Prof. Wayal R.M.
3	F.Y.B.Com	Business Mathematics & Statistics	Prof. Toke R.N.

Class: F.Y.B.Sc
Name: Prof. R. N. Toke

Subject : Algebra
No. of Lectures:36

Month	Topic
July	Sets, relation, equivalence relation, Equivalence classes, Function Types of function
August	Inverse of function, composition of function, Mathematical induction, division algorithm, greatest common divisor, Euclid's lemma. The Euclidean algorithm, fundamental theorem of arithmetic.
September	Prime numbers, theory of congruence, properties of congruence. Fermat's theorem, Sums and products, basic algebraic properties of complex number.
October	, moduli, complex conjugates Polar and exponential form of complex number, De-Moivers theorem, N^{th} root of unity

Class - F.Y.B.Sc

Name:-Prof. R. M. Wayal

Subject:- Calculus I

Total No. of lectures - 36

Month	Topic
July	Algebraic properties of \mathbb{R} , Order properties of \mathbb{R} , Well-Ordering Property of \mathbb{N} , Arithmetic mean-Geometric mean inequality, Bernoulli's inequality, Absolute value function and its properties, triangle inequality and its consequences. Definitions of Upper bound, Lower bound, supremum, infimum of subsets of \mathbb{R} , completeness property of \mathbb{R} . Archimedean property and its consequences, The density theorem. Sequences of real numbers.
August	Definition of limit of sequence and uniqueness of limit, bounded sequence, Monotone sequences, Monotone convergence theorem, Definition of subsequence, Divergence criteria, Monotone Subsequence theorem, Bolzano - Weierstrass theorem, The Completeness Property of \mathbb{R} . Functions, domain and range, graphs of functions.
September	Piecewise defined functions, increasing and decreasing functions, symmetry, common functions, limit of a function, divergence criteria, Squeeze theorem, one-sided limits, infinite limits, Definition of continuous function at a point.
October	sequential criterion for continuity, Divergence criterion, combination of continuous functions. Properties of continuous functions on an interval, Boundedness theorem, The minimum -maximum theorem,
November	Location of root theorem, Bolzano's intermediate value theorem. Continuous function maps closed bounded interval to closed bounded interval.

Class: S.Y.B.Sc

Name: Prof. R. M. Wayal

Subject : Calculus of Several Variables

No. of Lectures:36

Month	Topic
July	Functions of two variables, Domain and Range,
August	Graphs, Level Curves. Functions of Three or More Variables, Limits by using definition, different paths, polar coordinates. Continuity, Definition and examples of partial derivative. Higher Derivatives, Clairaut's Theorem, higher order partial derivative, Differential, Equations, Wave equation. Differentiable function, Differentials, Chain Rule.
September	Homogeneous Functions, Euler's theorem, Extreme values of functions of two variables. Necessary conditions for extreme values. Second Derivative Test.
October	Lagrange Multipliers. Iterated Integrals, Fubini's Theorem. Double integral over general regions, Change of order of integration for two variables. Double integral in Polar coordinates. Triple integrals, Evaluation of triple integrals. Triple

	integrals in spherical coordinates. Jacobians, Change of variables in multiple integrals.
--	---

Class - S.Y.B.Sc.

Subject:- Numerical Analysis &It's Application

Name:- Prof. R. M. Wayal

Total No. of lectures - 36

Month	sTopic
August	Errors and their computations, Bisection method. The method of False position,Newton- Raphson method, Finite Difference Operators and their relations (Forward, Backward difference and Shift operator). Differences of a polynomial, Newton's forward Interpolation Formula.
September	Newton's Backward Interpolation Formulae, Lagrange's Interpolation Formula, Numerical Differentiation, A General Quadrature formula, The rapezoidal rule, Simpson's 1/3rd rule. Simpson's 3/8th rule.
October	Taylor's series method, Picard's Method successive approximations.Euler's & Modified Euler's Methods. Runge Kutta Method (Second and fourth order).

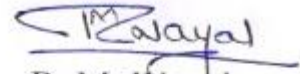
Class - F.Y.B.Com.

Subject:- Business Mathematics & Statistics

Name:- Prof. R. N. Toke

Total No. of lectures - 48

Month	Topic
July	Interest:-Concept of Present value and future value , simple interest ,compound interest, nominal and effective rate of interest, example and problems. Annuity:- Ordinary Annuity, Sinking Fund, Annuity due, present value and future value, equated monthly installment by interest of reducing balance and flat interest method, examples and problem, Share :-Concept of share, face value, market value.
August	dividend, brokerage, equity shares, preferential shares, examples and problem.Mutual Funds:- Concept of mutual funds, problems on calculation of net income ,Change in net asset value. Definition of Statistics, Scope of statistics in economics.
September	Management Science and Industry. Concept population and sample, method of data collection: Census and sampling with illustration . method of random sampling -(SRSWR, SRSWOR, Stratified, Systematic), Frequency distribution : Row data, attributes and variables.
October	classification of data, frequency distribution, cumulative frequency distribution, Histogram and ogive curves. Requisites of ideal, Arithmetic mean, Median, Mode, Geometric mean,Harmonic mean, Standard Deviation (S.D),Coefficient of variation(C.V)



R. M. Wayal

Head

Department of Mathematics
Hutatma Rajguru
Mahavidyalaya, Rajgurunagar