K.T.S.P.Mandal's

Hutatma Rajguru Mahavidyalaya, Rajgurunagar

Department Of Mathematics

Syllabus Completion Report

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   **Subject : Algebra**
Name: Prof. R. N. Toke   **No. of Lectures:40**

Month	Topic	No. of lectures
July	Sets, relation, equivalence relation,.	09
August	Equivalence classes, Function Types of function, inverse of function, composition of function, Mathematical induction, division algorithm, greatest common divisor, Euclid's lemma. The Euclidean algorithm, fundamental theorem of arithmetic.	11
September	Prime numbers, theory of congruence, properties of congruence. Fermat's theorem,.	09
October	Sums and products, basic algebraic properties, moduli, complex conjugates Polar and exponential form of complex number, De-Moivers theorem, N^{th} root of unity	11

Class - F.Y.B.Sc   **Subject:- Calculus I**
Name:-Prof. R. M. Wayal   **Total No. of lectures - 37**

Month	Topic	No. of lectures
July	Algebraic properties of R, Order properties of R, Well-Ordering Property of 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 R, completeness property of R. Archimedean property and its consequences, The density theorem**.**	13
August	Sequences of real numbers. 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 - Wierstrass theorem, The Completeness Property of R.	12
September	Functions, domain and range, graphs of functions, Piecewise defined functions, increasing and decreasing functions, symmetry, common functions, limit of a function, divergence criteria, Squeeze theorem, one-sided limits, infinite limits,	
October	Definition of continuous function at a point , sequential criterion for continuity, Divergence criterion, combination of continuous functions. Properties of continuous functions on an interval, Boundedness theorem, The minimum -maximum theorem,	8
November	Location of root theorem, Bolzano's intermediate value theorem. Continuous function maps closed bounded interval to closed bounded interval.	4

Class: S.Y.B.Sc   **Subject : Calculus of Several Variables**
Name: Prof. R. M. Wayal   **No. of Lectures:44**

Month	Topic	No. of lectures
July	Functions of two variables	2
August	Domain and Range, 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.	12
September	Differentiable function, Differentials, Chain Rule, homogeneous Functions, Euler's theorem, Extreme values of functions of two variables. Necessary conditions for extreme values.Second Derivative Test.	10

Month	Topic	No. of lectures
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.	14
November	Jacobians, Change of variables in multiple integrals	06

Class - S.Y.B.Sc.   **Subject:- Numerical Analysis &It's Application**
Name:- Prof. R. M. Wayal   **Total No. of lectures - 46**

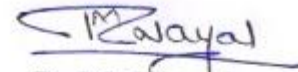| Month	Topic	No. of lectures
August	Errors and their computations, Bisection method. The method of False position,Newton- Raphson method, Finite Difference Operators and their relations (Forward, Backward difference and Shift operator). Differences of a polynomial,	15
September	Newton's forward Interpolation Formula, Newton's Backward Interpolation Formulae, Lagrange's Interpolation Formula, Numerical Differentiation, A General Quadrature formula, The rapezoidal rule, Simpson's 1/3rd rule.	13
October	Simpson's 3/8th rule. . Taylor's series method, Picard's Method successive approximations.Euler's & Modified Euler's Methods. Runge Kutta Method (Second and fourth order).	18

Class - F.Y.B.Com.   **Subject:- Business Mathematics & Statistics**
Name:- Prof. R. N. Toke   **Total No. of lectures - 54**

Month	Topic	No. of lectures
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	15
August	Share :-Concept of share, face value, market value, 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.	14
September	Definition of Statistics, Scope of statistics in economics , 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)	12
October	Frequency distribution : Row data, attributes and variables,	13

| | 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

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