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Pimpalner Education Society's

Karm. A. M. Patil Arts, Commerce & Kai. Annasaheb
N. K. Patil Science Senior College Pimpalner, Tal.- Sakri
Dist.- Dhule.



NAAC Reaccredited 'B' Grade

TEACHER'S DIARY

ACADEMIC YEAR : 2020 - 2021

Name : Prof. Kadu Dala Kadam

Designation : Associate Professor

Department : Mathematics

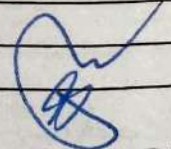


TEACHING PLAN

Class : F.Y.B.Sc. Sem.: I Subject : Matrix Algebra Paper Code. : MSH-101

Sr. No.	Month	Topics/Practical's
1.	Sep. 20	<p>Unit-1: Rank of Matrix</p> <ul style="list-style-type: none"> a. Elementary Operations on Matrices . b. Adjoint of a Matrix & Inverse of a Matrix . c. Existence & Uniqueness theorem of Inverse of a Matrix . d. Properties of Inverse of a Matrix . e. Elementary Matrices . f. Rank of and Normal form of a Matrix . <p>Reduction of a Matrix to its normal form .</p>
2.	Oct-20	<p>g. Rank of product of two matrices .</p> <p>Unit-2: System of Homogeneous Linear Equations</p> <ul style="list-style-type: none"> a. A System of linear equations . b. Consistency of system of linear equations . c. Application of matrices to solve the system of eqⁿ . d. Homogeneous system of linear equations .
3.	Nov. 20	<p>Unit-3: Eigen Values and Eigen Vectors</p> <ul style="list-style-type: none"> a. Orthogonal Matrices & Properties of Orthogonal Matrices . b. Ch. eqⁿ, Eigen Value & Eigen Vector of matrices . c. Cayley Hamilton Theorem, and its use to find the inverse of a matrix .
4.	Dec-20	<p>Unit-4: Matrix Transformation .</p> <ul style="list-style-type: none"> a. Two & Three dimensional matrix Transform . b. Application of matrices to scaling & shearing . c. Application of matrices to Reflection, Rotation & Transform .
5.	Jan. 21	<p>Revision .</p> <p>Test / Tutorial / Internal Exam .</p>

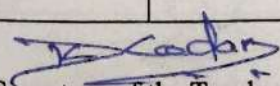
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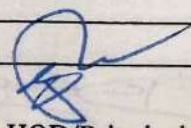

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TEACHING PLAN

Class : F.T.B.Sc. Sem.: I Subject : Calculus Paper Code. : MPH-102

Sr. No.	Month	Topics/Practical's
1.	Sep. 20	Unit-1: Limits and Continuity. a) ϵ - δ definition of limit of a function. b) Properties of limits, Indeterminate forms & L-Hospital's rule. c) Continuous functions, Properties of continuous functions on closed and bounded intervals. d) Theorems on boundedness of continuous functions including intermediate value theorem. e) Uniform Continuity.
2.	Oct-20	Unit-2: Mean Value Theorems. a) Differentiability. b) Rolle's Theorem. c) Lagrange's M.V.T. d) Cauchy's M.V.T. e) Geometrical interpretation & application.
3.	Nov. 20	Unit-3: Successive Differentiation. a) The n th derivative of some std. functions x^m , $(ax+b)^m$, e^{ax+tb} , $\frac{1}{ax+tb}$, $\log(ax+tb)$, $\sin(ax+tb)$ $\cos(ax+tb)$, $e^{ax} \sin(bx+tc)$ & $e^{ax} \cos(bx+tc)$. b) Leibnitz's Theorem and examples.
4.	Dec-20	Unit-4: Application of Calculus. a) Taylor's theorem with Lagrange's form of remainder and related examples. b) Maclaurin's theorem with Lagrange's form of remainder and related examples. c) Reduction formulae i) $\int_0^{\pi/2} \sin^n x dx$, ii) $\int_0^{\pi/2} \cos^n x dx$, iii) $\int_0^{\pi/2} \sin^m x \cos^n x dx$ & iv) $\int \frac{\sin^m x}{\cos^n x} dx$.
5.	Jan. 21	Revision. Test / Tutorial / Internal exam.

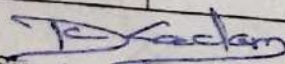

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TEACHING PLAN

Class : B.T.B.Sc. Sem.: I Subject : Graph Theory Paper Code : 525TH-103(B)

Sr. No.	Month	Topics/Practical's
1.	Sep. 20	Unit-1: Graphs. Graph, simple graph, multigraph, Hand shaking Lemma Types of graphs, Operations on graphs. Subgraphs, Isomorphism of graphs, Walk, path, cycles (or circuits)
2.	Oct. 20	Unit-2: Connected Graphs. Connected and disconnected graphs Bridges, Cut vertices, Edge connectivity and vertex connectivity, Eulerian graph, Hamiltonian graph, Plane graph, Euler's formula for plane graphs. Kuratowski's tree graphs Geometrical dual.
3.	Nov. 20	Unit-3: Trees and Directed Graphs. Definition & some properties of trees Distance & centre in a tree. Root. Binary trees, Spanning trees Minimal spanning trees, Directed graphs, Types of digraphs.
4.	Dec. 20	Unit-4: Application of the Graphs. Existence of graph for given no. of vertices and edges, coloring of the graph. Konigsberg's Seven Bridge Problem. Travelling Salesman Problem Dijkstra's algorithm Marshall's algorithm Formation of flowchart using rooted trees.
5.	Jan. 21	Revision Test/Tutorial/Internal Exam

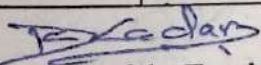

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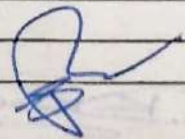

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TEACHING PLAN

Class: S-7-B.Sc. Sem.: IV Subject: Calculus of Several Variables Paper Code.: SMTH-301

Sr. No.	Month	Topics/Practical's
1.	Aug. 2020	Unit-1: Functions of Two and Three Variables 1.1: Explicit and Implicit Functions. 1.2: Continuity 1.3: Partial Derivatives
2.	Sep. 2020	1.4: Differentiability 1.5: Necessary and Sufficient Conditions for Differentiability 1.6: Partial Derivatives of Higher Order 1.7: Schwarz's Theorem 1.8: Young's Theorem
3	Oct 2020	Unit-2: Jacobian, Composite Functions & M.V.T. 2.1: Jacobian (only for Two & Three Variables) 2.2: Composite Functions (Chain Rule) 2.3: Homogeneous Functions. 2.4: Euler's Theorem for Homogeneous function. 2.5: M.V.T. for fun. of two variables.
4.	Nov. 2020	Unit-3: Taylor's Theorem and Extreme Values 3.1: Taylor's Theorem for fun. of Two Variables 3.2: Maclaurin's Theorem for fun. of Two Variables 3.3: Absolute and Relative Extremum. 3.4: Necessary Condition for Extrema. 3.5: Critical Point, Saddle Point. 3.6: Sufficient Condition for Extrema.
5.	Dec-2020	Unit-4: Double and Triple Integrals 4.1: Double Integral's by Using Cartesian and Polar Coordinates. 4.2: Change of Order of an Integration. 4.3: Area by Double Integral. 4.4: Evaluation of Triple Integral as Repeated Integral. 4.5: Volume by Triple Integral.
		Revision Test/Tutorial/Internal exam.

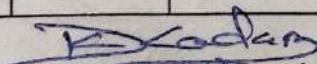

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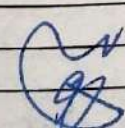

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TEACHING PLAN

Class : S.Y.B.Sc. Sem.: III Subject : Group Theory Paper Code : MTH-202103

Sr. No.	Month	Topics/Practical's
1.	Aug. 2020	Unit-1: Groups. 1.1: Def ⁿ & examples of group. 1.2: Simple properties of group. 1.3: Abelian Group.
2	Sep. 2020	1.4: Finite and Infinite Groups. 1.5: Order of a Group. 1.6: Order of an Element and It's Properties
2		Unit-2: Subgroups 2.1: Def ⁿ & Example of subgroups. 2.2: Simple Properties of Subgroups 2.3: Criteria for a subset to be a subgroup.
3.	Oct 2020	2.4: Cyclic Group. 2.5: Normal Subgroup and Coset Decomposition 2.6: Lagrange's Theorem for Finite Group 2.7: Euler's Theorem and Fermat's Theorem.
		Unit-3: Homomorphism and Isomorphism of Groups 3.1: Def ⁿ and Example of Group Homomorphism 3.2: Properties of Group Homomorphism.
4.	Nov. 2020	3.3: Kernel of a Group Homomorphism & it's properties 3.4: Def ⁿ & examples of Isomorphism 3.5: Def ⁿ & Examples of Automorphism of Groups. 3.6: Properties of Isomorphism of Groups.
		Unit-4: Rings. 4.1: Def ⁿ & Simple properties of a Ring 4.2: Commutative Ring Ring with unity, Boolean Ring.
5.	Dec. 2020	4.3: Ring with zero divisors and without zero divisors. 4.4: Integral Domain, Division Ring and Field. Simple Properties.
		Revision Test/Tutorial/ Internal Exam.

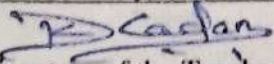

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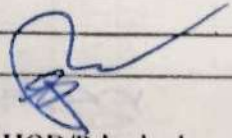

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TEACHING PLAN

Class : S.Y.B.Sc. Sem.: III Subject : Practical Course Based on MATH. 2019 MATH. 2020 Paper Code : MTH-303.

Sr. No.	Month	Topics/Practical's
1.	Aug-2020	1) Functions of Two and Three Variables
2.	Sep-2020	2) Jacobian, Composite function and M.T. 3) Taylor's Theorem and Extreme Values
3.	Oct-2020	4) Double and Triple Integrals. 5) Groups
4.	Nov-2020	6) Subgroups 7) Homomorphism and Isomorphism of Groups
5.	Dec-2020	8) Rings Revision/Test/Tutorial/Internal Exam.

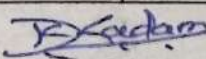

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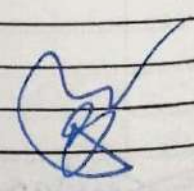

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TEACHING PLAN

Class : S.Y. Base. Sem.: III Subject : Set Theory & Logic Paper Code. : MTH-30A

Sr. No.	Month	Topics/Practical's
1.	Sep. 2020	Unit-1: Sets and Subsets - 1.1: Finite set and Infinite Set 1.2: Equality of Two Sets 1.3: Null set, Subset, Proper Subset, Symmetric Difference of Two Sets 1.4: Universal set, Power set, Disjoint Sets 1.5: Operation on sets: Union & Intersection 1.6: Venn Diagram 1.7: Equivalent Sets 1.8: Countable and Uncountable Sets
2.	Oct-2020	Unit-2: Relations and Functions 2.1: Product of Sets 2.2: Relations, Types of Relations, Reflexive, symmetric, Transitive relations and Equivalence relations. 2.3: Function, Type of Functions, One-one, Onto, Even, Odd and Inverse Functions 2.4: Composite Functions
3.	Nov. 2020	Unit-3: Algebra of Propositions 3.1: Statements, Conjunction, Disjunction 3.2: Negation, Conditional and Bi-conditional statements, Propositions. 3.3: Truth Table, Tautology and Contradiction. 3.4: Logical Equivalence, Logical equivalence statements
4.	Dec-2020	Unit-4: Quantifiers: 4.1: Propositional Functions and Truth Sets. 4.2: Universal Quantifier, Existential Quantifiers. 4.3: Negation of propositional which contain quantifiers, Counter examples. Revision Test/Tutorial/Internal Exams.

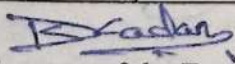

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TEACHING PLAN

Class : F.Y.B.Sc. Sem.: II Subject : Ordinary Diff. Eqⁿ Paper Code. : MSH-201

Sr. No.	Month	Topics/Practical's
1.	Mar-21	<p><u>Unit-1: Differential Equations of First Order & First Degree</u></p> <p>a) Partial Derivatives of First Order & Second Order.</p> <p>b) Exact Diff. Eqⁿ. Condition for exactness.</p> <p>c) Integrating factor (I. F.)</p> <p>d) Rules for finding integrating factors.</p> <p>e) Linear Diff. Eqⁿ.</p> <p>f) Bernoulli's Eqⁿ, Eqⁿ reducible to linear form.</p>
2.	Apr-21	<p><u>Unit-2: Differential Eqⁿ of First Order & Higher Degree.</u></p> <p>a) Diff. Eqⁿ of First Order & Higher Degree.</p> <p>b) Eqⁿ solvable for p.</p> <p>c) Eqⁿ solvable for q.</p> <p>d) Eqⁿ solvable for x.</p> <p>e) Clairaut's eqⁿ form of eqⁿ.</p>
3.	May-21	<p><u>Unit-3: Linear Diff. Eqⁿ with constant coefficients.</u></p> <p>a) Linear Diff. Eqⁿ with constant coefficients.</p> <p>b) Complementary Functions (C.F.)</p> <p>c) Particular Integral of $f(D)y = X$ where $X = e^{ax}, \cos(ax), \sin(ax), x^n, e^{ax}y, x^ny$ with usual notations</p>
4.	June-21	<p><u>Unit-4: Homogeneous Linear Diff. Eqⁿ</u></p> <p>a) Homogeneous Linear Diff. Eqⁿ (Cauchy's Diff. Eqⁿ)</p> <p>b) Example of Homo. linear diff. eqⁿ.</p> <p>c) Eqⁿ reducible to homogeneous linear diff. eqⁿ (Legendre's eqⁿ)</p> <p>d) Examples of Eqⁿ reducible to homo. linear diff. eqⁿ.</p>
5.	July-21	<p>Revisions</p> <p>Test/Tutorial/ Internal Exam.</p>

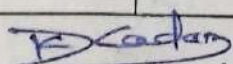

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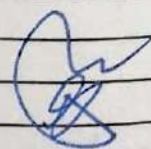
TEACHING PLAN

Class : F.Y. B.Sc. Sem.: II Subject : Theory of Equations Paper Code. : MTH-202

Sr. No.	Month	Topics/Practical's
1.	Mar-21	<p><u>Unit-1: Divisibility of Integers.</u> Natural number, Well Ordering Principle Principle of Mathematical Induction. Divisibility of Integers and theorems. Division Algorithm, GCD & LCM. Euclidean Algorithm. Unique Factorization Theorem.</p>
2.	April-21	<p><u>Unit-2: Polynomials</u> Division of Polynomials, Horner's method of synthetic division Existence and Uniqueness of GCD of the polynomials Polynomial eqⁿ, Factor Theorem and Generalised Factor Theorem for polynomials. Fundamental theorem of algebra. Methods to find common roots of polynomial eqⁿ Descartes's rule of sign. Newton's method of divisors for the integral roots.</p>
3.	May-21	<p><u>Unit-3: Theory of Equations-I</u> Relation betⁿ roots & coefficients of general poly. eqⁿ in one variable. Relation betⁿ roots & coefficients of quadratic, cubic, biquadratic eqⁿ. Symmetric function of roots.</p>
4.	June-21	<p><u>Unit-4: Theory of Equations-II</u> Transformation of eqⁿ Cardan's Method of Solving Cubic Eqⁿ. Biquadratic Equations Descartes's Method of Solving Biquadratic eqⁿ.</p>
5.	July-21	<p>Revision. Test / Tutorial / Internal Exsm.</p>



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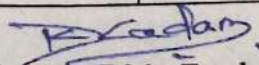


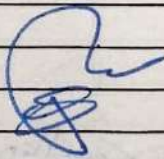
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TEACHING PLAN

Class : F.Y.B.Sc. Sem.: II Subject : Numerical Analysis Paper Code. : MTH-203(B)

Sr. No.	Month	Topics/Practical's
1.	Mar-21	Unit-1: Solution of Algebraic & Transcendental Equations Error and their computation. Absolute, relative and percentage errors. The Bisection Method. The Iteration Method The Method of false position Newton-Raphson Method.
2.	April-21	Unit-2: Interpolation Finite Differences Forward & Backward Differences Central Differences Symbolic relation and separation of symbols. Gauss's forward difference formula. Gauss's backward difference formula Interpolations with unequally spaced points Lagrange's interpolation formula Inverse Lagrange's formula.
3.	May-21	Unit-3: Curve Fitting Least square curve fitting procedure fitting of a st. line. Non-linear curve fitting Power fun. $y = ax + b$. Fitting of polynomial of degree two $y = a + bx + cx^2$ Fitting of exponential fun. $y = ae^{bx}$.
4.	June-21	Unit-4: Numerical Solution of Ordinary Diff. Eq ⁿ Numerical solution of first order ODE by Taylor's series Euler's Method and Modified Euler's Method Runge-Kutta's Method Runge-Kutta's method second and fourth order formulae
5.	July-21	Revision Test/Tutorial/Internal Exam.

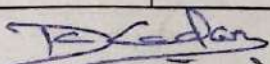

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TEACHING PLAN

Class : S.T.B.Sc. Sem.: IV Subject : Complex Variables Paper Code. : MTH-401

Sr. No.	Month	Topics/Practical's
1.	Feb. 21	<p>Unit-1: Complex Numbers .</p> <p>1.1: Complex Numbers, Modulus & Amplitude, Polar form</p> <p>1.2: Triangle Inequality and Argand's Diagram.</p> <p>1.3: De Moivre's Theorem for rational indices & applications</p> <p>1.4: n^{th} root of complex number.</p> <p>1.5: Elementary Functions: Trigonometric functions, Hyperbolic functions of a complex variable</p>
2.	Mar. 21	<p>Unit-2: Functions of Complex Variables</p> <p>2.1: Limits, Continuity and Derivatives .</p> <p>2.2: Analytic Functions, A necessary & sufficient condition for analytic function .</p> <p>2.3: Cauchy Riemann Equations</p> <p>2.4: Laplace Equation & Harmonic Functions</p> <p>2.5: Construction of analytic functions.</p>
3.	April 21	<p>Unit-3: Complex Integrations .</p> <p>3.1: Line Integral and Theorems on it .</p> <p>3.2: Statement & Verification of Cauchy-Goursat's Theorem</p> <p>3.3: Cauchy's Integral formulae for $f(z)$, $f'(z)$ and $f^{(n)}(z)$</p> <p>3.4: Taylor's and Laurent's series</p>
4.	May 21	<p>Unit-4: Calculus of Residues</p> <p>4.1: Zeros and Poles of a function .</p> <p>4.2: Residue of a function .</p> <p>4.3: Cauchy's Residue Theorem .</p> <p>4.4: Evaluation of Integrals by using Cauchy's Residue Theorem .</p> <p>4.5: Contour Integration of the type $\int_{\gamma} f(z) dz$, $\int_{\gamma} \frac{f(z)}{z-a} dz$ and $\int_{\gamma} \frac{f(z)}{z-a} dz$.</p>
5.	June 21	<p>Revision</p> <p>Test/Tutorial/ Internal Exam .</p>

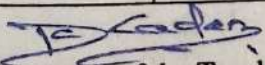

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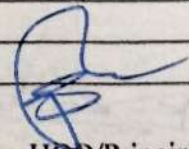

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TEACHING PLAN

Class : S-7-BSc. Sem.: IV Subject : Differential Equations Paper Code. : 505TH-4025A

Sr. No.	Month	Topics/Practical's
1.	Feb-21	Unit-1: Theory of Ordinary Differential Equations 1.1: Lipschitz's Condition. 1.2: Existence and Uniqueness Theorem. 1.3: Linearly Dependent and Independent solutions 1.4: Wronskian. 1.5: Linear Combinations of solutions 1.6: Theorems on i) Linear Combination of solutions ii) Linearly Independent solutions iii) Wronskian is zero. iv) Wronskian is non-zero.
2	Mar-21	Unit-2: Simultaneous Differential Equations 2.1: Simultaneous linear diff. eq ⁿ of first order 2.2: Simultaneous diff. eq ⁿ of the form $\frac{dx}{p} = \frac{dy}{q} = \frac{dz}{r}$ 2.3: Rule-I: Method of combinations 2.4: Rule-II: Method of multipliers 2.5: Rule-III: Properties of Ratios 2.6: Rule-IV: Miscellaneous
3.	April-21	Unit-3: Total Differential or Pfaffian Differential Equations 3.1: Pfaffian Diff. Eq ⁿ . 3.2: Necessary & Sufficient Condition for Integrability 3.3: Conditions for exactness 3.4: Method of solution by Inspection 3.5: Solution of Homogeneous Equations
4.	May-21	Unit-4: Difference Equations 4.1: Introduction, Order of difference eq ⁿ , degree of difference eq ⁿ . 4.2: Solution of difference eq ⁿ & formation of difference eq ⁿ . 4.3: Linear Difference Eq ⁿ Linear homogeneous difference eq ⁿ with constant coefficients 4.4: Non-homogeneous linear difference eq ⁿ with constant coefficients.
5.	June-21	Revision. Test/Reparial / Internal Exam.


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TEACHING PLAN

Class : S.T.B.Sc.


Sem. : IV

Subject : Practical Paper based on MATHS

Paper Code. : MTH-403

Sr. No.	Month	Topics/Practical's
1.	Feb-21	1) Complex Numbers
2.	Mar-21	2) Functions of Complex Variable
3.	"	3) Complex Integrations
4.	April-21	4) Calculus of Residues
5.	"	5) Theory of Ordinary Differential Equations
6.	May-21	6) Simultaneous Differential Equations
7.	"	7) Total (Puffin) Differential Equations
8.	June-21	8) Difference Equation
9.	"	Revision
10.	"	Test/Tutorial/ Internal Exam.

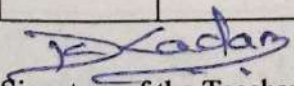
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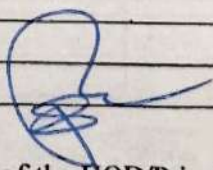

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TEACHING PLAN

Class : S-Y B.Sc. Sem.: IV Subject : Vector Calculus Paper Code. : 507TH-404

Sr. No.	Month	Topics/Practical's
1.	Feb-21	Unit-1: Product of Vectors 1.1: Scalar Product . 1.2: Vector Product . 1.3: Scalar Triple Product . 1.4: Vector Product of Three Vectors . 1.5: Reciprocal Vectors .
2.	Mar-21	Unit-2: Vector Functions 2.1: Vector function of single variable . 2.2: Limits and Continuity 2.3: Differentiability, Algebra of differentiation 2.4: Curves in space, Velocity & Acceleration 2.5: Vector function of two or three variables 2.6: Limits, Continuity, Partial Differentiation
3.	April-21	Unit-3: The Vector Operator ∇ . 3.1: The vector differentiation operator ∇ . 3.2: Gradient . 3.3: Divergence and curl . 3.4: Formulae involving ∇ . Identities .
4.	May-21	Unit-4: Vector Integration 4.1: Ordinary Integrals of Vectors 4.2: Line Integrals . 4.3: Surface Integrals
5.	June-21	Revision Test / Tutorial / Internal Exgm


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Year - 2020-2021

Pimpalner Education Society's

Karm. A. M. Patil Arts, Commerce & Kai. Annasaheb
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NAAC Reaccredited 'B' Grade

TEACHER'S DIARY

ACADEMIC YEAR : 2019 - 2020


Name : Dr. W. B. Shirsath
Designation : Associate Professor
Department : Chemistry



TEACHING PLAN

Class: F.Y.B.Sc., Sem.: I Subject: Chemistry Paper Code.: CH-101

Sr. No.	Month	Topics/Practical's
		Chapter - I - Electrolytic conductance
	August 2020	Introduction, Electrolytic conductance, Specific conductance, Equivalent conductance, Determination of conductance, Conductivity cell, Determination of Cell constant
		Variation of conductance with dilution, Equivalent conductance at infinite dilution
		Kohlrausch's law of independent migration of ions & its application.
		Application of conductance measurement - a) Determination of solubility of sparingly soluble Determination of degree of ionisation Determination of ionic product of water.
		Conductometric titration - S.A. vs S.B., W.A. vs S.B., S.A. vs W.B. Precipitation titration. Advantage of conductometric titration.
		Chapter - 2 Surface Chemistry
		Introduction; Adsorption, mechanism of Adsorption, Factor affecting the adsorption of gases on Solid Surface
		Types of Adsorption Physical & chemical adsorption Adsorption of gases by Solids Freundlich's Adsorption isotherm Langmuir Adsorption isotherm
		Chapter - 3 unit 3 - mathematical preparation in Chemistry - Introduction
		Unit - 1 - Logarithm; Natural logarithm Finding logarithm of any number. Determination of characteristics Determination of mantissa

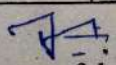

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TEACHING PLAN

Class : _____ Sem.: _____ Subject : _____ Paper Code : _____

Sr. No.	Month	Topics/Practical's
		Antilogarithm, Negative logarithm Examples on 'logarithm' unit.
		Unit-2 - Graphical representation of eq ⁿ . of st. line Important characteristics of graphs Plotting graph, The eq ⁿ . of st. line Slope of line, Intercept of line, point slope form Characteristics of st. line examples on it.
		Unit-3 - Derivative - Rules of derivative Problem/ examples on derivative Differentiation of function of function Differentiation of exponential & logarithmic functions Important point of differentiation, examples/ problems
		Unit-4 - Integration - Rules of Integration Application of Integration examples/ problems.
		Chapter-4 :- Periodic Properties :- Periodic law, size of atoms & ions, Atomic ionic, covalent and Vander-Waals radius. Variation of atomic radii in group & period Ionization energy - factors affecting I.E. Trends in I.E. Application of I.E. to chemical behaviour of an element. Electronegativity - factors affecting e ⁿ . affinity Trends in e ⁿ . affinity - in group & period Electronegativity - factors affecting electronegativity Trends in period & groups Determination of electronegativity - Pauling & Mulliken scale; Electronegativity & its ionic character
		Chapter-5 - s-Block elements - Introduction General characteristics, s-block elements. Electronic configuration, electronic configuration of alkali metals, electronic configuration of alkaline earth metals. Atomic radii, Ionization energy, colour of flame Reducing property, metallic property Complex formation - complex of alkali metal with acetylacetonide & acetyl acetone. Complex of alkali metal such as Beryllium complex ion


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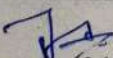
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TEACHING PLAN

Class : S.Y. B.Sc. Sem.: I Subject : Chemistry

Paper Code. : CH-301

Sr. No.	Month	Topics/Practical's
		<p>Chapter - Solution - Introduction, Solubility, Factors affecting solubility, Types of solution, Different way of expressing the concentration of solution. Ideal and non-ideal soln, Raoult's law & its limitation.</p> <p>The v.p. of actual liquid pairs and v.p. of ideal soln, classification of binary soln of completely miscible liquids (Type-I, Type-II, Type-III) on the basis of Raoult's law</p> <p>Boiling Point diagrams of miscible binary mixtures, Distillation of binary miscible solution, Azeotropes, the fractionating column Solubility of partially miscible liquid pairs</p> <p>Phase diagram - phenol-water system, Picric acid-amine-water & alicative water system.</p>
		<p>Chapter-2 - Colligative Properties -</p> <p>Introduction lowering of v.p. of solvent, Calculation of molecular wt of solute from lowering of v.p. of solvent, B.p. elevation of solution, F.p. depression of solution, Calculation of mol. wt. of solute from depression in f.p. osmosis and o.p. Relation of o.p. to v.p., Van't Hoff eqn. for o.p., Landolt's method for the determination of elevation of b.p. Beckmann method for determination of depression in f.p., Berthelot and Hardy method, Solution of electrolyte, colligative properties of electrolyte</p> <p>Related numerical.</p>
		<p>The d-block elements - Elements of 2nd and 3rd transition series, General characteristics of d-block elements - a) metallic character b) molar volume and density c) Atomic radii & Ionic radii d) m.p. & B.p. e) I.E. f) Reactivity g) oxidation state h) std. electrode potential i) Reducing properties j) colour k) magnetic properties l) catalytic properties</p> <p>Tendency to form complex.</p>


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TEACHING PLAN

Class : S.Y. B.Sc. Sem.: I Subject : Chemistry Paper Code. : CH-304

Sr. No.	Month	Topics/Practical's
		<p><u>1. Introduction to Analytical Chemistry</u> Introduction, Analytical Chemistry, Its Interdisciplinary nature, Importance of Analytical chemistry, Type of analysis, Quantitative and qualitative analysis.</p> <p>Concept of Sampling, definition, Procedure for Sampling, types of Sampling.</p> <p>Accuracy, Precision, Significant figure, Significance of zero, rounding off.</p> <p>Errors, Definition, Types of error. Sources of error, minimisation errors; Good laboratory practices, material safety data sheet, fire safety, Handling of chemicals.</p>
		<p><u>2. Acid-Base titration:</u> - Principles Acid-Base Indicator Henderson-Hasselbalch eqⁿ, titration range of Indicator.</p> <p>Acid-Base titration w.r. to neutralization Curve, selection of Indicator, Calculation of pH a) S.A. V S.B b) W.A. V S.B, Application of Acid-Base titration.</p>
		<p><u>3. Precipitation titration:</u> - Principle, Precipitation titration Curve, use of Indicator, detection of end of precipitation at AgNO₃ solⁿ Standardization by Mohr's method, Estimation of chloride by Fajans method Application of precipitation titration.</p>
		<p><u>4. Chromatography:</u> - Defⁿ, Introduction, Advantages & disadvantages of chromatography, Principle of chromatography Classification of chromatography - Partition, adsorption, Ion exchange chromatography.</p> <p>Paper-chromatography - Principle, Technique Rf value ascending & descending technique, Separation of metal ions; Application.</p> <p>Thin layer chromatography (TLC) Principle, technique & application.</p> <p>Ion exchange (column) chromatography (Cation and anion-exchange resins, Principle technique & application.</p>

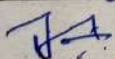
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TEACHING PLAN

Class : F.Y B.Sc Sem. II Subject : Chemistry Paper Code. : CH-201

Sr. No.	Month	Topics/Practical's
		<p><u>Chapter-1 - Gaseous State.</u></p> <p>MAR-2021 The kinetic theory of ideal gases, Assumptions of kinetic theory of gases, Kinetic gas equation & its significance, Deduction of gas law - Avogadro Principle, Graham's law, Kinetic energy of translation, Derivation of ideal gas from ideal behaviour, Reasons for deviation, Compressibility factor, Vander-Waal eqⁿ & its application, Andrew's isotherm of CO₂, Dalton's law, Critical constant and Vander-Waal constant, liquefaction of gases, Joule Thomson effect, related numerical.</p>
		<p><u>Chapter-2 - Liquid State.</u></p> <p>Introduction, Surface tension of liquid, unit of surface tension, factors affecting S.T. Determination of S.T. of liquids by capillary method and stalagmometer method, Viscosity of liquid, units of viscosity, measurements of viscosity of liquid by Ostwald method, related numerical.</p>
		<p><u>Chapter-3 - 2nd law of thermodynamics</u></p> <p>Introduction, Limitation of 1st law of thermodynamics, Spontaneous & non-spontaneous process with examples, Statement of 2nd law of thermodynamics, Entropy, Entropy changes in isolated system; Entropy changes for systems only, Entropy of mixing of gases, Entropy change in ideal gases and physical transformations, Numerical.</p>
		<p><u>Chapter-4 - Metals & Metallurgy - occurrence of metals, various steps involved in metallurgical process</u> Concentration of ores, Calcination, roasting, deduction to free metal, electrometallurgy, refining of metals.</p>
		<p><u>Chapter-5 - p-block elements.</u> - Electronic configuration of p block elements, Variation in properties, atomic radius, I.E., e^h. affinity, electronegativity, metallic character, oxidation states, reactivity, Acidic-basic character of hydrides, Bonding & shapes of following molecules - AlBr₃, P₄, S₈, ClF₃, SO₂.</p>


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TEACHING PLAN

Class : S.Y.B.Sc. Sem.: IV Subject : Chemistry Paper Code. : CH-401

Sr. No.	Month	Topics/Practical's
	MAR-2021	<p><u>Chapter-1 Electrochemistry -</u> Introduction, EMF and its measurements, Reversible and irreversible cells, Std. cell, Cell notation & EMF Convention regarding sign of EMF, single electrode potential, Std. hydrogen & Calomel electrode. Calculation of single electrode potential, Calculation of cell EMF from single electrode potential Thermodynamics of electrode potential (Nernst eqⁿ) Standard potential and eqⁿ constant. Classification of electrodes, Related numericals.</p>
		<p><u>Chapter-2 Chemical Thermodynamics</u> Introduction, The Helmholtz free energy ΔA for reaction, Gibbs free energy & ΔG for reaction; Properties and significance of Gibbs free energy change. Calculation of free energy change Fugacity and activity concepts, The reaction isotherm, Std. free energy change of formation Initial of eqⁿ, physical equilibria involving Pure substances, Clapeyron eqⁿ and its use. v.p. of liquid and relation of v.p. with temperature. Clausius-Clapeyron eqⁿ. Different form of Clausius-Clapeyron eqⁿ and its application Related numericals.</p>
		<p><u>Chapter-3 - Basic concept of Co-ordination Chemistry</u> Double salt and Co-ordination compounds, Co-ordination complex and Complex ions, Co-ordination number Unidentate, bidentate, and polydentate ligands. Chelating ligand and chelate, Physical method used in study of complex, Nomenclature of Co-ordination compounds.</p>
		<p><u>Chapter-4 :- conductors, Insulators and Semiconductors</u> General Properties of the metals, Conductors Insulators & Semiconductors, Intrinsic & extrinsic Semiconductors, Application of Semiconductors</p>

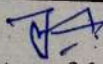
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TEACHING PLAN

Class : S.Y.B.Sc Sem.: IV Subject : Advanced Analytical Chemistry Paper Code : CH-204

Sr. No.	Month	Topics/Practical's
		<p><u>Chapter-1 - Redox titration.</u> Oxidation, Reduction, Redox reaction, Oxidising -reducing agents, Redox titration, Titration of Ce^{4+} & Fe^{2+}, Nature of titration curve, Calculations of end during titration Detection of end Pt - Redox Indicator Self indicator & Starch Indicator Titration involving iodine - Iodimetry & Iodometry Determination of dissolved oxygen (DO) of a water sample. Application of redox titration</p>
		<p><u>Chapter-2 - Complexometric titration</u> Complexes, ligand, types of ligand, Chelate Chelating agent formation of complexes, formation constant, Chelating agent, EDTA EDTA equilibrium, EDTA titration curve. Detection of end - Use of Indicator, principle involved in colour change of Indicator, Characteristic of metal ion indicator Application of complexometric titration with reference to analysis of soil, Estimation of calcium and magnesium ions by complexometric titration</p>
		<p><u>Chapter-3 - Gravimetric analysis -</u> Introduction, Advantage of gravimetric analysis Solubility product, Condition for precipitation Steps of gravimetric analysis precipitation of soil. Precipitation digestion, Impurities in the precipitate, Co-precipitation and Post precipitation filtration, Washing, drying or ignition, Weighing Application - estimation of Ba as BaSO_4 Ni as Ni-DMG, Pb as PbCrO_4</p>


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