

BHAVAN'S VIVEKANANDA COLLEGE
DEPARTMENT OF MATHEMATICS & STATISTICS
ACADEMIC ORGANISER
B.Sc. I YEAR SEMESTER -I 17-18 CBCS
Sub- MATHEMATICS PAPER- MT121
DIFFERENTIAL EQUATIONS & GROUP THEORY

UNIT NO	BUN	TOPICS	PERIODS PER
1		UNIT I D.E. of First Order and First Degree	(15)
JUNE&JULY	1	Introduction	1
	2	Partial differentiation	1
	3	Exact Differential Equations	2
	4	Non-Exact Differential Equations, Integrating factors, Methods	6
	5	Linear Differential Equations	3
	6	Differential Equations Reducible to Linear Form	2
2		II D.E. of the First Order but not of the First Degree	
JULY&AUG	1	Equations Solvable for p	3
	2	Equations Solvable for y	2
	3	Equations Solvable for x	2
	4	Clairaut's Equation	4
	5	Total differential equations	4
		UNIT III Groups-I (15)	
AUG	1	Introduction	1
	2	Groups-Definition and Elementary Properties	4
	3	Finite Groups and Group Tables	3
	4	Subgroups	3
	5	Cyclic Groups-Elementary properties, cyclic subgroups	7
		UNIT IV Groups-II (15)	
SEP	1	Permutations -functions and permutations	1
	2	Cycles and cyclic notations	1
	3	Even and odd permutations,	1
	4	Groups of permutations, Alternating groups	1
	5	Groups of Coset	3
	6	Criteria for the existence of a coset group	1
	7	Inner automorphism and Normal Subgroups, Definition of Factor group	2
	8	Homomorphisms-Def. and Elementary properties	2
	9	The fundamental theorem of homomorphism, applications	1
	10	Isomorphism-Def. and Elementary properties, Cayley's theorem	2
GRAND TOTAL			60

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DEPARTMENT OF MATHEMATICS & STATISTICS
ACADEMIC ORGANISER

B.Sc. I YEAR

SEMESTER -II CBC 17-18

Sub- MATHEMATICS

PAPER- MT221

DIFFERENTIAL CALCULUS & HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS

NIT NO.	SUB UN	TOPICS	PERIODS PER SUBUNIT
1		Differential Calculus I	
NOV&DEC	1	1 Introduction	1
	2	2 Succesive differentiation	3
	3	3 Calculation of nth derivatives of standard, rational & products of powers of sines and cosines	3
	4	4 Leibnitz's thereom. The nth derivative of product of two function	3
	5	5 Partial differntiation	
	6	6 Homogeneous functions and Eulers theorem.	3
	7	7 Total derivatives	1
2		Differential Calculus I (15)	
DEC&JAN	1	1 Neighbourhood, interval, supremum, infimum, limits, continuity	1
	2	2 Taylors and Maclaurins theorem	3
	3	3 Rolles , lagranges & Cauchy's theorem with geometric explanati	4
	4	4 Taylors and Maclaurins series	3
	5	5 Indeterminate forms	3
	6	6 Maxima and minima of two variables	1
3		Higher Order Linear Differential Equations-I (15)	
JAN	1	1 Solution of Homogeneous Linear Differential Equations of Order n with Constant Coefficients	3
	2	2 Solution of Non-homogeneous Linear Differential Equations with Constant Coefficients by means of Polynomial Operators	12
4		Higher Order Linear Differential Equations-II (12)	
FEB	3	1 Method of Variations of Parameters(Non-homogeneous Linear Differential Equations with Constant Coeff.)	3
	4	2 Reduction of order method	3
	5	3 The Cauchy-Euler Equation	3
	6	4 Legender's equation	3
		GRAND TOTAL	60

BHAVAN'S VIVEKANANDA COLLEGE
DEPARTMENT OF MATHEMATICS & STATISTICS
ACADEMIC ORGANISER 17-18

RING THEORY & PARTIAL DIFFERENTIAL EQUATIONS

B.Sc. II YEAR
Sub- MATHEMATICS

SEMESTER -III
PAPER- MT321

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT
1	Rings-I (15)		
AUGUST	1	Introduction	1
	2	Rings-Def. ,Some non-commutative Examples , basic properties	2
	3	Divisors of zero ,cancellation laws	2
	4	Integral Domains, Fields	3
	5	Characteristic of a ring	2
SEP	6	Ideals and Factor Rings.	5
2	Rings-II (15)		
SEP & OCT	1	Homomorphisms of rings-Def, elementary properties, kernal of homomorshism	4
	2	Maximal and prime ideals , Prime fields	4
	3	Rings of Polynomials-Polynomials in an indeterminate form	4
	4	The evaluation homomorphism	3
3	PARTIAL DIFFERENTIAL EQUATIONS-I (15)		
JUNE	1	Introduction	1
	2	Formation of partial differential equations	3
	3	Easilyintegrable partial differential equations	1
	4	Linear partial differential equations of first order	2
JULY	5	Non Linear partial differential equations of first order	5
	6	Charpits method	3
4	PARTIAL DIFFERENTIAL EQUATIONS-II (15)		
JULY	1	Homogeneous linear equations with constant coefficients	8
	2	Non Homogeneous linear partialdifferential equations	4
	3	Separation of variables	3



BHAVAN'S VIVEKANANDA COLLEGE
DEPARTMENT OF MATHEMATICS & STATISTICS
ACADEMIC ORGANISER 17-18
REAL ANALYSIS

B.Sc. II YEAR
Sub- MATHEMATICS

SEMESTER -IV
PAPER- MT421

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT
1	UNIT-I (15)		
NOV	1	Limit of Sequences	4
	2	Limit Theorems for Sequences	4
DEC	3	Monotone Sequences	4
	4	Cauchy Sequences	3
2	UNIT-II (15)		
DEC	1	Subsequences	4
	2	Lim sup's and Lim inf's	1
JAN	3	Series	5
	4	Alternating Series	3
	5	Integral Tests	2
3	UNIT-III (15)		
JAN	1	Sequences of functions	3
	2	Series of functions	3
	3	Power Series	3
FEB	4	Uniform Convergence	3
	5	Differentiation and Intergration of Power Series(Theorems in this section without proofs)	3
4	UNIT-IV (15)		
FEB & MARCH	1	The Riemann Integral	5
	2	Properties of Riemann Integral	5
	3	Fundamental Theorem of Calculus	5





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Academic Organiser 2017-18
Department of Mathematics & Statistics
B.Sc. III year Semester V
Subject: NUMERICAL ANALYSIS

Month	UNIT.NO.	Topics	No.of classes per topic	TOTAL NO.OF PERIODS
J U N E & J U L Y	UNIT 3	Solutions of Linear system of equations		12
		Introduction	1	
		Matrix Inversion method	2	
		Gauss elimination method	2	
		Method of factorisation-LU Decomposition method	2	
		ill conditioned linear system	1	
		Jacobi's method	2	
		Gauss -seidel method	2	
J U L Y & A U G U S T	UNIT 4	Numerical solution of ordinary Differential equations		11
		Picard's method of successive approximations	2	
		Solution by Taylor's series	2	
		Euler's method	2	
		Modified Euler's method	2	
		Runge-Kutta method	3	
A U G U S T	UNIT 1	ERRORS IN NUMERICAL COMPUTATIONS		10
		Introduction	1	
		Significant digits, Rounding errors and truncation errors	1	
		Absolute, relative and percentage errors	2	
		General error formula	2	
		Errors in series expansion	2	
S E P T E M B E R	UNIT 2	Solutions of Algebraic and Transcendental Equations		12
		Bisection method	3	
		The method of false position	2	
		The iteration method	2	
		Newton Raphson method	2	
		Generalized Newton's method	2	
		Revision	1	

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DEPARTMENT OF MATHEMATICS
BHAVAN'S VIVEKANANDA COLLEGE
ACADEMIC ORGANISER
MATHEMATICS PAPER III
B.Sc. - III Year SEM -V(2017-18)
REAL ANALYSIS-II&LINEAR ALGEBRA-I

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
REAL ANALYSIS-II				
1		DIFFERENTIATION		10
JUNE & JULY	1	Continuity and Properties of Continuous Funcions	2	
	2	The Derivative-Increasing and Decreasing Functions, Darboux Theorem	2	
	3	Rolle's, Lagranges and Cuachy's Mean Value Theorems	2	
	4	Higher order Derivatives (Taylor's and Maclaurin's Expansions)	2	
	5	Indeterminate Forms	2	
2		RIEMANN INTEGRAL		12
JULY	1	Definition and existence of integral	4	
	2	Conditions for Integrability	2	
	3	Theorems on Integrability	3	
	4	The Primitive	1	
	5	The Fundamental Theorem of Integral Calculus	2	
Linear Algebra I				
3		Vector Spaces		13
AUG & SEP	1	Introduction	1	
	2	Vector Spaces - General Properties	1	
	3	Vector Subspaces - Algebra of subspaces	1	
	4	Linear Combinatons of vectors, Linear span,Linear sum of two subspaces	2	
	5	Linear dependence and Linear Independence of vectors	3	
	6	Basis of vector space Finite dimensional vector spaces	3	
	7	Dimension of vector spaces and vector subspaces	2	
4		INNER PRODUCT SPACES		10
SEP	1	Inner Product Spaces-Definition	1	
	2	Euclidean and unitary spaces	1	
	3	Norm or length of a vector	1	
	4	Schwartz Inequality, Triangle Inequality	2	
	5	Othogonality, Orthogonal Set, Orthonormal set, orthonormal Basis	3	
	7	The Gram-Schmidt Orthogonalization Process	2	
GRAND TOTAL				45





**Bharatiya Vidya
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Academic Organiser 2017-18

Department of Mathematics & Statistics

B.Sc. III year Semester VI

Subject: NUMERICAL ANALYSIS

Month	UNIT.NO.	Topics	No.of classes per topic	TOTAL NO.OF PERIODS
N O V & D E C	UNIT 1	INTRODUCTION WITH UNIFORM SPACING		12
		Newton's Forward Interpolation formula	2	
		Newton's Backward Interpolation formula	2	
		Central Difference formula-Gauss Forward	2	
		Lagrange's Interpolation Formula	2	
		Stirling's Interpolation formula	2	
		Relation between the operators	2	
D E C & J A N	UNIT 2	INTERPOLATION WITH NON-UNIFORM MESH SPACING		11
		Lagrange's Interpolation Formula	4	
		Inverse Lagrange's Interpolation formula	3	
		Newton's divided difference formula	4	
J A N & F E B	UNIT 3	NUMERICAL DIFFERENTIATION & INTEGRATION		11
		DIFFERENTIATION -Newton's forward &backward	3	
		INTEGRATION- General Quadrature formula	1	
		Trapezoidal rule	2	
		Simpson's rule	3	
		Boole's & Weddle's rule	3	
F E B	UNIT 4	CURVE FITTING		11
		Linear curve fitting-Fitting a straight	3	
		Non-Linear curve fitting	3	
		Fitting an exponential curve	2	
		Fitting a power curve	3	

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MATHEMATICS PAPER III

B.Sc. - III Year SEM -VI (2017-18)

LINEAR ALGEBRA II & VECTOR INTEGRATION

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
Linear Algebra II				
1		LINEAR TRANSFORMATION-I		12
NOV & DEC	1	Linear transformation , Properties of Linear transformations	3	
	2	Range , Null Space , Rank and Nullity of Linear transformation	3	
	3	Invertible linear transformations	3	
	4	Representation of Transformation by Matrices- Matrix of a Linear transformation only.	3	
2		LINEAR TRANSFORMATIONS -II		13
DEC & JAN	1	Characteristic values and Characteristic vectors of a Linear transformation	3	
	2	Characteristic values and Characteristic vectors of a Matrix	4	
	3	Cayley-Hamilton Theorem	3	
	4	Diagonalizable Operators	3	
VECTOR INTEGRATION				
3		VECTOR INTEGRATION-I		10
JAN	1	Integration of Vector-Introduction, Definite Integral	2	
	2	Line Integrals	2	
	3	Surface Integrals,	3	
	4	Volume Integrals	3	
4		VECTOR INTEGRATION-II		10
FEB & MAR	1	Integral Transformations- Gauss Divergence theorem and its deductions	4	
	2	Greens theorem in a plane	3	
	3	Stokes theorem in a plane	3	
TOTAL				45

