I.B. (PG) COLLEGE, PANIPAT
(SESSION 2021-2022)

Weekly Lesson Plan (Odd Semester) Post Graduate **First Semester**

Name of the Paper:- Advanced Abstract Algebra -I **Class: M.Sc. Previous**

Name of the Teachers (Section wise): DEEPALI

WEEK	DATE	TOPICS
1	October (28 - 30)	Automorphism of a group G
		Inner automorphism of a group G
		The group Aut(G) and Inn(G)
VACATIONS: 31.10.2021 to 07.11.2021 - DIWALI BREAK		
2	November (8-13)	Automorphism group of a cyclic group
		Normaliser of a non-empty subset of a group
		Centraliser of a non-empty subset of a group
		Theorems on normaliser and centraliser
		Theorems on normaliser and centraliser
		Conjugate elements and conjugacy class
SUNDAY - 14.11.2021		
3	November (15 -20)	Class equation of a finite group
		Applications of a class equation
		Derived group
		Perfect group
		Holiday -19.11.2021 - Guru Nanak Dev Jayanti
		Theorem on perfect group
SUNDAY - 21.11.2021		
4	November (22-27)	Zassenhau's lemma
		Normal series
		Scheier's refinement theorem
		Simple group and composition series
		Theorems on composition series
		Theorems on composition series
SUNDAY - 28.11.2021		
5	November (29-30)	Jorden Holder theorem
		Composition series of group of order p^n and abelian groups
	December (1-4)	Cauchy theorem for finite groups
		p-groups
		Sylow theory
		Sylow theory
SUNDAY - 5.12.2021		

6	December (6-11)	Sylow theory
		Problem discussion of section-1
		Test of section -1
		Characteristic of a ring with unity
		Prime fields,theorem on prime fields
		Field extension
SUNDAY - 12.12.2021		
7	December (13-18)	Degree of an extension
		Algebraic and Transcendental elements
		Theorems on field extension
		Theorems on field extension
		Theorems on field extension
		Simple field extension
SUNDAY - 19.12.2021		
8	December (20-25)	Theorems on simple field extension
		Theorems on simple field extension
		Minimal polynomial of an algebraic extension
		Conjugate elements
		Algebraic extension
		Holiday -25.12.2021 - Christmas
SUNDAY - 26.12.2021		
9	December (27-31)	Finitely generated Algebraic extension
		Theorems on algebraic extension
		Theorems on algebraic extension
		Theorems on algebraic extension
		Algebraic closure and algebraically closed fields
	January (1)	Splitting fileds
SUNDAY -02.01.2022		

10	January (3-8)	Theorems on splitting fields
		examples on splitting fields
		Finite fields
		Normal extension
		Theorem Normal extension
		Problem discussion of section-2
Holiday -9.01.2022 -Guru Gobind Singh Jayanti		
11	January (10-15)	Test of section-2
		Seperable elements
		Seperable polynomial and seperable extension
		Theorems on seperable extension
		Theorems on seperable extension
		Theorems on seperable extension
SUNDAY - 16.01.2022		
12	January (17-22)	Theorem of primitive element
		Perfect fields
		Galois extension
		Galois group of an extension
		Dedekind lemma
		Fundamental theorem of Galois theory
SUNDAY - 23.01.2022		
13	January (24-29)	Frobenius automorphism of a finite field
		Klein's 4-group
		Holiday -26.01.2022 -Republic Day
		Diheadral group
		Galois groups of polynomials
		Fundamental theorem of algebra
SUNDAY - 30.01.2022		

14	January (31)	Problem discussion os section-3
	February (1-5)	Test of section -3
		Solvable groups
		Derived series of a group
		Simplicity of the alternating group An (n>=5)
	Holiday - 5.02.2022 -Vasant Panchami	
SUNDAY - 6.02.2022		
15	February (7-12)	Non-solvability of the symmetric group Sn
		Non-solvability of the alternating group An
		Roots of unity cyclotomic polynomials and their irreducibility over Q
		Radical extension
		Galois radical extension
		Cyclic extension
		SUNDAY -13.02.2022
16	February (14-19)	Solvability of polynomials by radicals over Q
		Construction with ruler and compass only
		Problem discussionof section -4
		Test of section -4
		Revision
		Discussion of previous year question papers
		SUNDAY - 20.02.2022
17	February (21-22)	Discussion of previous year question papers
		Test of previous year question papers

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Weekly Lesson Plan (Odd Semester) Post Graduate First Semester

Name of the Paper:- Complex Analysis Class: MSc Mathematics (Previous)

Name of the Teachers (Section wise): Sakshi Sharma

WEEK	DATE	TOPICS
1	October (28 - 30)	Introduction to Power Set
		Power Series
		Power Series
VACATIONS: 31.10.2021 to 07.11.2021 - DIWALI BREAK		
2	November (8-13)	Convergence of power series
		Radius of Convergence
		Examples based on convergence and ROC
		Problem Discussion
		Sum and product
		Differentiabilty of Sum function of power series
SUNDAY - 14.11.2021		
3	November (15 -20)	Differentiabilty of Sum function of power series
		Properties of differentiable function with derivative zero
		Exp z and its properties
		log z and its properties
		Holiday -19.11.2021 - Guru Nanak Dev Jayanti
		Power of a complex number (z)
SUNDAY - 21.11.2021		
4	November (22-27)	Branches with analyticity
		Path in a region
		Smooth path
		Piece wise smooth path
		Contour, Simply and multiply connected region
		Bounded Variation
SUNDAY - 28.11.2021		
5	November (29-30)	Total Variation
		Complex Integration
	December (1-4)	Cauchy Goursat Theorem
		Cauchy theorem for simply and multiply connected domains
		Problem discussion
		Class test based on the topics covered
SUNDAY - 5.12.2021		
6	December (6-11)	Index or winding number of a closed curve with simple properties
		Cauchy integral formula
		Extension of Cauchy integral formula for multiple connected domain
		Higher order derivative of Cauchy integral formula.
		Examples
		Gauss mean value theorem
SUNDAY - 12.12.2021		

7	December (13-18)	Morera's theorem
		Problem discussion
		Cauchy's inequality
		Zeros of an analytic function
		Zeros of an analytic function
		Entire function
SUNDAY - 19.12.2021		
8	December (20-25)	Radius of convergence of an Entire function
		Liouville's theorem
		Liouville's theorem
		Fundamental theorem of algebra
		Fundamental theorem of algebra
		Holiday -25.12.2021 - Christmas
SUNDAY - 26.12.2021		
9	December (27-31)	Taylor's theorem
		Taylor's theorem
		Problem discussion
		Class test based on the topics covered
	January (1)	Maximum modulus principle
		Minimum modulus principle
SUNDAY -02.01.2022		
10	January (3-8)	Schwarz Lemma
		Singularity, their classification
		Singularity, their classification
		Pole of a function and its order
		Laurent series
		Examples
Holiday -9.01.2022 -Guru Gobind Singh Jayanti		
11	January (10-15)	Cassorati – Weiertrass theorem
		Meromorphic functions
		Poles and zeros of Meromorphic functions
		Poles and zeros of Meromorphic functions
		The argument principle
		Rouche's theorem
SUNDAY - 16.01.2022		

12	January (17-22)	Inverse function theorem
		Examples based on above theorems
		Examples based on above theorems
		Problem discussion
		Problem discussion
		Class test based on the topics covered
		SUNDAY - 23.01.2022
13	January (24-29)	Residue : Residue at a singularity
		Residue at a simple pole
		Holiday -26.01.2022 -Republic Day
		Residue at infinity
		Cauchy residue theorem
		Use of Cauchy residue theorem to calculate certain integrals
		SUNDAY - 30.01.2022
14	January (31)	Definite integral
	February (1-5)	Definite integral
		Integral of different types
		Integral of different types
		Poles on the real axis
		Holiday - 5.02.2022 -Vasant Panchami
		SUNDAY - 6.02.2022
15	February (7-12)	Poles on the real axis
		Integral of many valued functions
		Integral of many valued functions
		Problem discussion
		Bilinear transformation
		Properties of bilinear transformation and classification
		SUNDAY -13.02.2022
16	February (14-19)	Cross ration, preservance of cross ration under bilinear transformation
		Preservance of circle and straight line under bilinear transformation
		Fixed point bilinear transformation
		Normal form of a bilinear transformation.
		Definition and examples of conformal mapping
		Critical points
		SUNDAY - 20.02.2022
17	February (21-22)	Problem discussion
		Problem discussion

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Weekly Lesson Plan (Odd Semester) Post Graduate First Semester

Name of the Paper:- Differential Equation Class: M.Sc. I

Name of the Teachers (Section wise): Manish Kumar

WEEK	DATE	TOPICS
1	October (28 - 30)	Basic about differential equation
		degree and order,type of differential equation
		Related examples
VACATIONS: 31.10.2021 to 07.11.2021 - DIWALI BREAK		
2	November (8-13)	Related examples
		Initial value problem
		approximation solution
		equicontinuous set of function
		Related examples
		Related examples
SUNDAY - 14.11.2021		
3	November (15 -20)	Related examples
		Related examples
		Cauchy euler theorem
		Ascoli arzela theorem
		Holiday -19.11.2021 - Guru Nanak Dev Jayanti
		cauchy peano existence theorem and its corollary
SUNDAY - 21.11.2021		
4	November (22-27)	Lipschtiz condition
		Related examples
		Related examples
		Related examples
		Differential inequalties and uniquness
		gronwell inequality
SUNDAY - 28.11.2021		
5	November (29-30)	succesive approximation
		Related examples
	December (1-4)	Related examples
		Related examples
		Related examples
		Picard lindelof theorem
SUNDAY - 5.12.2021		

6	**December (6-11)**	continuation of solution
		maximal interval of existence
		maximal interval of existence
		maximal interval of existence
		Related examples
		Related examples
SUNDAY - 12.12.2021		
7	**December (13-18)**	Kneser theorem
		extension theorem
		theorems
		Related examples
		doubts
		Test
SUNDAY - 19.12.2021		
8	**December (20-25)**	linear differential system
		linear homogenous system
		fundamental matrix
		Related examples
		Adjoint system
		Holiday -25.12.2021 - Christmas
SUNDAY - 26.12.2021		
9	**December (27-31)**	Adjoint system
		Reduction to smaller homogrnous system
		non homogenous linear system
		variation of constant
		Related examples
	January (1)	
SUNDAY -02.01.2022		

10	January (3-8)	theorems
		linear system with constant coefficient
		linear system with periodic coefficients
		Related examples
		Related examples
		theorems
Holiday -9.01.2022 -Guru Gobind Singh Jayanti		
11	January (10-15)	Floquet theory
		Related examples
		theorems
		doubts
		class test
		Higher order equations
SUNDAY - 16.01.2022		
12	January (17-22)	linear differential equation of order n
		linear combinations
		linear depandence,independence of solution
		wronskian theory
		wronskian theory
SUNDAY - 23.01.2022		
13	January (24-29)	necessary and sufficient condition of solution
		Abels identity
		Holiday -26.01.2022 -Republic Day
		Related examples
		fundamental set
SUNDAY - 30.01.2022		

14	January (31)	more wronksian theory
	February (1-5)	reduction of order
		theorems
		Related examples
		variation of parameters
	Holiday - 5.02.2022 -Vasant Panchami	
SUNDAY - 6.02.2022		
15	February (7-12)	Adjoint equation
		Lagranges identity
		green formula
		linear equation of order n with constant coefficients
		Related examples
		system of differential equation
		SUNDAY -13.02.2022
16	February (14-19)	dependance of solution on initial conditions
		continuity and differentiability
		maximal and minimal solution
		differential inequalities
		wintner theorem
		kamke theorem , nagumo theorem
		SUNDAY - 20.02.2022
17	February (21-22)	Osgood theorem
		Problem discussion

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Weekly Lesson Plan (Odd Semester) Post Graduate **First Semester**

Name of the Paper:- REAL ANALYSIS-I **Class: M.SC.(PREVIOUS)**

Name of the Teachers (Section wise): KOMAL

WEEK	DATE	TOPICS
1	October (28 - 30)	Definition and existence of riemann integral function
		Definition and existence of RIEMANN STIELJES INTEGRAL,and some examples
		theorem based on upper sum
VACATIONS: 31.10.2021 to 07.11.2021 - DIWALI BREAK		
2	November (8-13)	theorem based on lower sum
		theorem based on refinement and common refinement
		theorem based on integration
		thorem based on differentiation
		cauchy criteria for integrability
		theorem based on differentiation continued.
SUNDAY - 14.11.2021		
3	November (15 -20)	doubt session
		first mean value theorem
		Change of variable
		fundamental theorem of integral calculus
		Holiday -19.11.2021 - Guru Nanak Dev Jayanti
		integration by parts
SUNDAY - 21.11.2021		
4	November (22-27)	theorem based on integration by parts
		doubt session
		integration by vector valued function
		examples based on integration by vector valued function
		unit step function(introduction)
		rectifiable curves general introduction
SUNDAY - 28.11.2021		
5	November (29-30)	theorem based on rectifiable curve
		doubt session
	December (1-4)	general introduction to sequence and series
		convergence of a sequence
		convergence of a series
		pointwise convergence and examples
SUNDAY - 5.12.2021		

6	December (6-11)	uniform convergence and example based on uniform convergence
		Cauchy criterion for uniform convergence
		weirstrass M-TEST
		Abel's test for uniform convergence
		Dirichlet's test for uniform convergence
		doubt session
SUNDAY - 12.12.2021		
7	December (13-18)	Uniform continuity
		examples based on uniform continuity
		RIEMANN STIELTJES INTEGRATION
		UNIFORM CONVERGENCE AND DIFFERENTIATION
		EXISTENCE OF REAL CONTINUOUS NOWHERE DIFFERENTIABLE FUNCTION
		doubt session
SUNDAY - 19.12.2021		
8	December (20-25)	Introduction to equicontinuous families of fuctions
		theorem based of equicontinuous functions
		weierstrass approximation theorem
		doubt session
		general introduction to variables
		Holiday -25.12.2021 - Christmas
SUNDAY - 26.12.2021		
9	December (27-31)	intro about functions of several variables
		LINEAR TRANSFORMATION
		THEOREMS BASED ON LINEAR TRANSFORMATION
		derivative in an open subset of R^n
		definitions of fixed point contration mapping
	January (1)	examples of contartion mapping
SUNDAY -02.01.2022		
10	January (3-8)	banach fixed point theoprem(CONTRATION PRINCIPAL)
		CHAIN RULE
		DEFINITION OF CONVEX SET and some theorems based on it
		partial derivative
		Differential derivatives
		INVERSE FUNCTION THEOREM
Holiday -9.01.2022 -Guru Gobind Singh Jayanti		

11	**January (10-15)**	IMPLICIT FUNCTION THEOREM
		JACOBIANS
		EXTREME PROBLEMS WITH CONSTRAINTS
		LAGRANGE'S MULTIPLIER METHOD
		doubt session
SUNDAY - 16.01.2022		
12	**January (17-22)**	test of section 1
		derivative of hiogher order
		mean value theorem for real functions of two variables
		interchange of the order of differentiation
		doubt session
SUNDAY - 23.01.2022		
13	**January (24-29)**	test of section 2
		differentiation of integrals
		Holiday -26.01.2022 -Republic Day
		introduction to power series
		examples of power series
		uniqueness theorem for power series
SUNDAY - 30.01.2022		
14	**January (31)**	ABEL'S AND TAUBER'S THEOREM
	February (1-5)	TAYLOR'S THEOREM
		Exponential &logarithm fuctions
		functions
		trigonomertic functions
	Holiday - 5.02.2022 -Vasant Panchami	
SUNDAY - 6.02.2022		
15	**February (7-12)**	fourier series
		gamma function
		doubt session
		test (half section 3)
		test(remaining half section-3)
		integration of differtial forms
		SUNDAY -13.02.2022

16	**February (14-19)**	partitions of unity
		differential forms
		STOKES THEOREM
		Doubt session
		test of section -4(first half portion)
		test of section -4(second half portion)
		SUNDAY - 20.02.2022
17	**February (21-22)**	Revision
		Revision

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Weekly Lesson Plan (Odd Semester) Post Graduate **First Semester**

Name of the Paper:- **Topology** **Class: M.Sc. P**

Name of the Teachers (Section wise): Mansi Bansal

WEEK	DATE	TOPICS
1	October (28 - 30)	Definition of topological space
		Examples of topological space
		Examples of topological space
VACATIONS: 31.10.2021 to 07.11.2021 - DIWALI BREAK		
2	November (8-13)	Neighbourhood system of a point and its properties
		Neighbourhoods
		Interior point and interior of a point
		Interior of various topologies
		Theorems on interior point
		Theorems on interior point
SUNDAY - 14.11.2021		
3	November (15 -20)	Interior as an operator and its properties
		Problem discussion
		Closed set as a complement of open set
		Limit point of a set
		Holiday -19.11.2021 - Guru Nanak Dev Jayanti
		Derived set of a set
SUNDAY - 21.11.2021		
4	November (22-27)	Definition of closure of a set as a union of the set and its derived points
		Theorems on limit point
		Adherent point of a set
		Closure of a set as set of adherent points
		Properties of closure
		Closure as an operator and its properties
SUNDAY - 28.11.2021		
5	November (29-30)	Boundary of a set
		Theorems on boundary of a set
	December (1-4)	Dense set
		Base for topology and its characterization
		Base for neighbourhood system
		Theorems on base for topology and neighbourhood system
SUNDAY - 5.12.2021		

6	**December (6-11)**	Sub-base for topology
		Induced topology and subspace of a topological space
		Alternate methods of defining a topology
		Kuratowski closure operator
		First countable space
		Second countable space
SUNDAY - 12.12.2021		
7	**December (13-18)**	Seperable space
		Complete lattice
		Problem discussion
		Continuous function
		Composition of continuous functions
		Open and closed functions
SUNDAY - 19.12.2021		
8	**December (20-25)**	Homeomorphism
		Embedding
		Tychonoff product topology in terms of standard subbase
		Projection maps
		Characterisation of product topology as the smallest topology with projections
		Holiday -25.12.2021 - Christmas
SUNDAY - 26.12.2021		
9	**December (27-31)**	Continuity of a function from a space into product of spaces
		T0 ,T1 SPACE
		T2,T3 Space
		Hereditary property
		Quotent topology w.r.t. a map
	January (1)	About Hausdorffness of quotent space
SUNDAY -02.01.2022		

10	**January (3-8)**	Problem discussion
		Completely regular and tychonoff space
		Hereditary properties
		Productive properties
		Embedding lemma
		Embedding theorem
Holiday -9.01.2022 -Guru Gobind Singh Jayanti		
11	**January (10-15)**	Normal and T4 spaces
		Examples
		Urysohn's lemma
		Complete regularity of a regular normal space
		T4 implies tychonoff space , TIETZE'S EXTENSION THEOREM
		Filters on a set
SUNDAY - 16.01.2022		
12	**January (17-22)**	Collection of all filters on a set as a p.o. set
		Finer filter
		Ultra filter and its characterization
		Ultra filter principle
		Image of filter under a function
		Convergence of filters
SUNDAY - 23.01.2022		
13	**January (24-29)**	Limit point and limit of a filter
		Continuity in terms of convergence of filters
		Holiday -26.01.2022 -Republic Day
		Hausdrorffness anf filter convergence
		Problem discussion
		Compactness
SUNDAY - 30.01.2022		

14	January (31)	Definition of a compact subset oa a compact subspace
	February (1-5)	Relation of open cover of a subset of a topological space in the sub-space with that
		Compactness in terms of finite intersection property
		Continuity and compact sets
		Closedness of compact subset
	Holiday - 5.02.2022 -Vasant Panchami	
SUNDAY - 6.02.2022		
15	February (7-12)	Hausdorff space and its consequence
		Regularity and normality of a comact hausdorff space
		Compactness and filter convergence
		Convergence of filters in a product space
		Convergence of filters in a product space
		Tychonoff product theorem using filters
		SUNDAY -13.02.2022
16	February (14-19)	Hausdroff Compactification
		Hausdroff Compactification
		Stone-cech compactification
		Stone-cech compactification
		Problem discussion
		Test
		SUNDAY - 20.02.2022
17	February (21-22)	Revision
		Revision