

RPS Degree College, Balana (Mahendergarh)

on Plan

2020-21(Odd Semester)

Class and Section: B.Sc. HM 5th Sem.

Subject: Real Analysis

Lecture	Topics
1	Introduction to Syllabus, Scheme of Exam & Learning Objectives/Outcomes
2	Test to Check the Learning Level of the Students
3	Bounds of Sets
4	Topology of real numbers
5	Upper and lower sums
6	Defination of riemann integral
7	Relation between sums
8	Examples on based on upper and lower sums
9	Condition of integrability
10	Integrability of continuous function
11	Seceond defination of integrability
12	Properties of riemann integral
13	First mean value theorem
14	Primitive of a function
15	Fundamental theorem of integral calculus
16	Generalised mean value theorem
17	Verify mean value theorem
18	Improper integral
19	Types of improper integral
20	Comparison test for convergence
21	An important comparison integral
22	Convergence of Beta function
23	General test for convergence
24	Comparison test
25	General test for convergence at infinty
26	Convergence of Gamma function
27	Dirichlet's test for convergence
28	Frullani's integral
29	Integral as a function of a parameter
30	Leibnitz rule
31	Induced metric
32	Semi metric space
33	Bounded and unbounded metric space
34	Open and closed sphere, interior point
35	Limit point,discrete metric space
36	properties of open and closed set
37	Equivalent metrics
38	Convergence in metric space
39	Complete metric space
40	Completeness of Real number
41	Cantor's intersection theorem
42	First category space
43	Baire's Category theorem
44	Contraction principle in metric space
45	Continuous function

46	Isometry
47	Contraction mapping
48	Compact set and compact metric space
49	Bolzano weierstrass property
50	Countably compact space
51	Finite intersection property
52	Total boundedness
53	Continuity and compactness
54	Connected and disconnected set
55	Theorems on separated set



RPS Degree College, Balana (Mahendergarh)

Syllabus Plan

2020-21(Odd Semester)

Class and Section: BSc HM 5th Sem.

Subject: Group and Rings (BM-352)

Lecture	Topics
1	Introduction to Syllabus, Scheme of Exam & Learning Objectives/Outcomes
2	Test to Check the Learning Level of the Students
3	Theory of Group
4	Example of Group
5	properties of Group
6	Subgroup
7	Subgroup criteria
8	Generation of Group
9	Cyclic Group
10	question based on Group
11	question based on subgroup
12	Question based cycle Group
13	Cosets
14	Left coset
15	Right coset
16	Theorem based on Cosets
17	Index of a subgroup
18	Coset decomposition
19	Lagrange's theorem
20	Consequences of Lagrange's theorem
21	Normal Subgroup
22	Quotient Group
23	Theorem on Normal Subgroup
24	Theorem on Quotient Group
25	Homomorphism
26	Isomorphism
27	Automorphism
28	Inner Automorphism
29	Automorphism of Cyclic Group
30	Permutation Group
31	Even permutation
32	Odd permutation
33	Alternating Group
34	Caley's theorem
35	Centre of a group

36	Derived group of a group
37	Introduction to Rings
38	Subrings
39	Integral Domain
40	Field
41	Characteristics of a Ring
42	Ring homomorphism
43	Ideals
44	Quotient Rings
45	Field of quotient of an integral Domain
46	Euclidean rings
47	Polynomial rings
48	polynomial over the rational fiel
49	The Eisenstein's criterion of irreducibility
50	Polynomial rings over commutative rings
51	Unique factorization domain
52	R unique factorization domain implies so is $R\{X_1, X_2, \dots, X_n\}$
53	Theorem on irreducible polynomial



RPS Degree College, Balana (Mahendergarh)

1 Plan

Class and Section: B.Sc. HM 5th Sem.

Subject: Numerical Analysis

Lecture	Topics
1	Introduction to Syllabus, Scheme of Exam & Objectives/Outcomes Learning
2	Test to Check the Learning Level of the Students
3	Finite Differences operators and their relations
4	Finite Differences operators and their relations
5	Finding the missing terms and effect of error in a difference tabular values
6	Interpolation with equal intervals
7	Newton's forward interpolation formulae derivation
8	Newton's forward interpolation formulae questions
9	Newton's forward interpolation formulae questions
10	Newton's backward interpolation formulae derivation
11	Newton's backward interpolation formulae questions
12	Newton's backward interpolation formulae questions
13	Interpolation with unequal intervals
14	Newton's divided difference formula
15	Lagrange's Interpolation formulae
16	Hermite Formula
17	Questions on above topics
18	Questions on above topics
19	Central Differences: Gauss forward interpolation formulae derivation
20	Gauss forward interpolation formulae questions
21	Gauss's backward interpolation formulae derivation
22	Gauss's backward interpolation formulae questions
23	Questions on above topics
24	Questions on above topics
25	Sterling formula derivation.
26	Questions on Sterling formula
27	Bessel Formula derivation
28	Questions on Bessel formula
29	Probability distribution of random variables
30	Binomial distribution
31	Poisson's distribution
32	Normal distribution
33	Mean, Variance and Fitting
34	Mean, Variance and Fitting
35	Numerical Differentiation
36	Derivative of a function using Newton's forward interpolation formulae
37	Derivative of a function using Newton's backward interpolation formulae
38	Derivative of a function using Gauss forward interpolation formulae
39	Derivative of a function using Gauss backward interpolation formulae
40	Derivative of a function using Newton's divided difference interpolation formulae

41	Derivative of a function using Lagranges interpolation formulae
42	Derivative of a function using Hermite interpolation formulae
43	Derivative of a function using Sterling interpolation formulae
44	Derivative of a function using Bessel interpolation formulae
45	Eigen Value Problems
46	Power method
47	Jacobi's method
48	Given's method
49	House-Holder's method
50	QR method
51	Lanczos method
52	Questions on above topics
53	Questions on above topics
54	Numerical Integration
55	Newton-Cote's Quadrature formula
56	Newton-Cote's Quadrature formula
57	Trapezoidal rule,
58	Simpson's one- third and rule
59	Simpson's and three-eighth rule
60	Chebychev formula
61	Gauss Quadrature formula
62	Numerical solution of ordinary differential equations
63	Picard's method
64	Picard's method questions
65	Taylor's series method
66	Euler's method
67	Modified Euler's method
68	Runge-Kutta Methods
69	Runge-Kutta Methods questions
70	Milne-Simpson's method

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2019-20(Odd Semester)

Class and Section: B.Sc(H.M.) 5th Sem.

Subject: Operations Research-I, BHM-356

Name of the Faculty : Mr. Satyender Singh

Lecture	Topics
1	Introduction to Syllabus, Scheme of Exam & Learning Objectives/Outcomes
2	Definition and Scope of Operations Research
3	Methodologies used in Operations Research
4	Different Fields of Application
5	Detailed discussion over Applications continued
6	Types of Operations Research Models
7	Advantages and features of Operations Research
8	Concept of Optimization Problems
9	Linear Programming problems
10	General form, Canonical form and Standard form of LPP
11	Terminology used in LPP
12	Formulation of LPP
13	Numericals on Formulation of LPP
14	Graphical method of Solution of LPP : Discussion
15	Procedural steps to solve LPP by graphical method
16	Numericals on Graphical Method
17	Numericals Continued
18	Advantages of LP Models
19	Limitations of LP Model
20	Multiple and unbounded solution problems
21	Infeasible solution instances of LP Problems
22	Simplex Method for solution of LPP
23	Standard and canonical form of an LPP
24	Basic solution and Basic feasible solution of LPP
25	Computational procedure for simplex method
26	Cases of unique feasible solution
27	Problems with no feasible solution
28	Problems with unbounded solution
29	Degenerace in LPP
30	Artificial variable technique
31	Two phase method for LPP
32	Numericals continued
33	Big-M method for solution of LPP
34	Numericals Continued
35	Duality in LPP
36	Primal-Dual problem: Different types
37	Transportation problems : Discussion
38	Solution of Transportation problems
39	Problems Continued
40	Modified distribution method
41	Unbalanced and degenerate transportation problems
42	Transshipment problem
43	Maximization in transportation problem
44	Assignment Problems
45	Hungarian Method
46	Unbalanced Assignment problems
47	Maximization in Assignment problems
48	Crew Assignment Problems
49	Travelling Salesman problem
50	Numericals on Assignment problems
51	Game theory Terminology
52	Games with saddle points
53	m by 2 and 2 by n games
54	m by n games
55	Numericals continued
56	The rule of dominance
57	Solution of a Game
58	Algebraic method
59	Graphical method for Games
60	Problems continued
61	Linear Programming method for solution of a game
62	Revision of Section 4
63	Revision Continued
64	Problems session
65	Presentation Lecture
66	Revision Section 3
67	Isometry
68	Section 3 Problems session
69	Presentation Lecture
70	Section 2 Revision
71	Problems Discussion
72	Revision Continued
73	Presentation Lecture
74	Section 1 Discussion
75	Problems Discussion
76	Revision Continued
77	Revision Continued
78	Presentation Lecture
79	Subject Extensions
80	Future Scope of the Subject Matter

RPS Degree College, Balana (Mahendergarh)

Lesson Plan

2020-21(Odd Semester)

Class and Section: HM 5th sem

Subject: Integral Equation

Name of the Faculty : Ms.Nisha

Lecture	Topics
1	Introduction to Syllabus, Scheme of Exam & Learning Objectives/Outcomes
2	Test to Check the Learning Level of the Students
3	Definition of integral equation
4	Linear integral equation and singular integral equation
5	Some basic identities
6	Initial value problem reduced to volterra integral equation
7	Example of initial value problems reduced to volterra integral equations
8	Example of initial value problem reduced to volterra integral equations
9	Method of successive approximation to solve volterra integral equation of second kind
10	Method of successive approximation to solve volterra integral equation of second kind
11	Example of volterra integral equation by method of successive approximation
12	Example by method of successive approximation
13	iterated kernels
14	Neumann series
15	Solution of volterra integral equation by method of iterated kernels
16	Resolvent kernel as a series
17	Resolvent kernel of volterra integral equation of second kind
18	Resolvent kernel
19	Laplace transformation and convolution product
20	Laplace transformation and convolution product
21	Solution of volterra integral equation by laplace transformation
22	Solution of volterra integral equation by laplace transformation
23	Solution of volterra integral equation by laplace transformation
24	Boundary value problem reduced to free dol integral equation
25	Boundary value problem reduced to Fre integral equation
26	Method of successive approximation to solve Fredholm equation of second kind
27	Method of successive approximation to solve Fredholm equation of second kind
28	Itreated Kernel sand neumann series for Fredholm equations
29	Resolvent kernel as a sum of series
30	Fredholm resolvent kernel as a ratio of two series
31	Degenerate kernel
32	Fredholm questions with degenerate kernel
33	Approximation of kernel by a degenerate kernel
34	Fredholm alternative

35	Green's function
36	Method of variation of parameters to construct green function
37	Basic four properties of the green function
38	Construction of the green's function by using its four properties
39	Green's function
40	Green's function
41	Method of series representation of the green function
42	Reduction of boundary value problem to Fredholm integral equation
43	Reduction of BVP to Fredholm eq.
44	Symmetric kernel
45	Orthonormal and orthogonal set
46	Fredholm eq. with symmetric kernels
47	solution of Fredholm eq. of second kind with symmetric kernels
48	Method of Fredholm resolvent kernel
49	Method of iterated kernel
50	Fredholm eq. of first kind with symmetric kernels
51	Fredholm eq. of first kind
52	Revision
53	Revision
54	Revision
55	Revision

RPS Degree College, Balana (Mahendergarh)

Lesson Plan

Class and Section: Hons. Maths 5th Sem.

Subject: Mathematics - Methods of applied mathematics

Name of the Faculty : Ms. Ananta Thakur

Lecture	Topics
1	Preliminary concepts
2	Useful equation in cylindrical coordinates
3	Crystal results
4	Solution of laplace equation in cylindrical co-ordinates
5	Axially symmetrical solution 3-D laplace equation
6	Determination of potential function
7	Solution of heat (diffusion) equation
8	Solution of wave equation
9	Solution of transverse vibration of thin membrane
10	Vibration of a circular membrane
11	Useful equation in spherical coordinates
12	Solution of laplace equation in spherical co-ordinates
13	Solution of laplace equation in spherical co-ordinates
14	Determination the potential on a spherical surface
15	Steady state temperature due to spherical symmetry
16	Heat equation in spherical polar coordinates
17	Temperature in a sphere at surface
18	3D wave equation in spherical polar coordinate
19	Regular Sturm Liouville Problem
20	Temperature in a bar with insulated ends
21	Temperature distribution in a bar with radiating end
22	Steady state temperature in plates
23	Dirichlet's problem
24	Steady state temperature in a rectangular plates
25	Wave equation in a infinite string
26	Wave equation for a semi-infinite string
27	Heat conductor in a semi-infinite bar
28	Steady state temperature in a infinite plate
29	Temperature distribution in a infinite cylinder
30	D'Alembert Solution
31	Hankel Transforms
32	Bessel's Function
33	Laplace Transformation
34	Gamma function
35	Dirac delta function
36	Properties of delta diracfunction
37	Hankel Transforms of nth order
38	Inverse hankel transform
39	Operational properties of hankel transform
40	Application of hankel transform in p.d.e
41	Steady temperature distribution in a semi infinite solid
42	Axis symmetric diffusion equation
43	Finite fourier sine and cosine Transforms
44	Conduction problem in a finite domain with the dirichlet data
45	Heat conduction problem in a finite domain
46	Application of multiple finite fourier Transform
47	Moment of inertia of a particle
48	Angular momentum of a body
49	Principle Moment of Inertia of a rigid body
50	kinetic energy of rigid body
51	kinetic energy in terms of P.I and M.I
52	Equipomental system
53	Numericals
54	Theorems
55	Numericals
56	coplanar mass distribution
57	momental ellipsoid
58	Numericals
59	Revision
60	Numericals
61	Numericals
62	Numericals
63	REVISION
64	REVISION
65	Numericals
66	Isometry
67	Definitions
68	Numericals
69	Numericals
70	Numericals
71	Addition theorem and multiplication theroem
72	Numericals
73	Revision
74	REVISION
75	revision
76	overall analysis
77	Extensions of the subject
78	Future scope of the subject