



RPS Degree College, Balana (Mahendergarh)

Syllabus Plan

2020-21(Odd Semester)

Class and Section: B.Sc Non Medical 5th Sem

Subject: Inorganic chemistry

Lecture	Topics
1	Introduction of syllabus
2	Introduction of syllabus
3	SECTION A: VBT and its limitations
4	Postulates of CFT
5	Crystal field splitting in octahedral field
6	Crystal field splitting in octahedral field
7	Crystal field splitting in tetrahedral field
8	Crystal field splitting in tetrahedral field
9	Crystal field splitting in Square Planar complexes
10	Crystal field splitting in tetragonal complexes
11	Factors affecting CFSE
12	Factors affecting CFSE
13	Differences between CFT and VBT
14	Color of transition metal complexes
15	Revision
16	SECTION B: Thermodynamic stability of complexes
17	Stability Constant
18	Kinetic and thermodynamic stability
19	Factors affecting stability
20	Factors affecting stability
21	Substitution reactions in square planar complexes
22	Substitution reactions in square planar complexes
23	Rate law
24	Types of substitution reactions
25	Trans influence
26	Trans effect
27	Trans effect
28	Theories of trans effect
29	Theories of trans effect
30	Revision
31	SECTION C: Types of magnetic behaviour
32	LS coupling ,Measurement of magnetic susceptibility
33	Measurement of magnetic susceptibility
34	Relation between magnetic susceptibility and magnetic moment
35	Variation of magnetic susceptibility with temperature

36	Orbital contribution to magnetic moment
37	Orbital contribution to magnetic moment
38	Orbital contribution to magnetic moment
39	Neels Temperature, Curies Temperature
40	Temperature independent paramagnetism
41	Temperature independent paramagnetism
42	Magnetic behavior of 3d metal complexes
43	Magnetic behavior of 3d metal complexes
44	Anomalous magnetic moment
45	Revision
46	SECTION D: Basis of electron absorption spectroscopy
47	Term symbols and coupling schemes
48	Term symbols and coupling schemes
49	Selection rules
50	Selection Rules
51	Splitting of states in Octahedral and Tetrahedral fields
52	Splitting of states in Octahedral and Tetrahedral fields
53	Spectrochemical series
54	Orgel energy level diagrams
55	Orgel energy level diagrams
56	Electronic Spectra of complex ions
57	Electronic Spectra of complex ions
58	discussion of the electronic spectrum of $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$ complex ion.
59	discussion of the electronic spectrum of $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$ complex ion.
60	Revision



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Curriculum Plan

2020-21(Odd Semester)

Class and Section: B.sc 5th sem Non Medical

Subject: Organic Chemistry

Lecture	Topics
1	Principle of nuclear magnetic resonance
2	The PMR Spectrum
3	Number of signals
4	Peak areas
5	Equivalent and nonequivalent protons positions of signals and chemical shift
6	Shielding and deshielding of protons
7	Proton counting
8	Splitting of signals and coupling constants
9	Magnetic equivalence of protons
10	Discussion of PMR spectra of the molecules: Ethyl bromide
11	Npropyl bromide, Isopropyl bromide, 1,
12	1-dibromoethane, 1, 1,2-tribromoethane, ethanol
13	Acetaldehyde, ethyl acetate, toluene, Benzaldehyde and Acetophenone
14	Simple problems on PMR spectroscopy for structure determination of organic compounds
15	Classification and nomenclature. Monosaccharides
16	Mechanism of osazone formation
17	interconversion of glucose and fructose
18	Chain lengthening and chain shortening of aldoses
19	Configuration of monosaccharides
20	Erythro and threo diastereomers
21	Conversion of glucose into mannose
22	Formation of glycosides, ethers and esters
23	Determination of ring size of glucose and fructose
24	Open chain and cyclic structure of D(+)-Glucose & D(-) Fructose
25	Mechanism of mutarotation
26	Structures of ribose and deoxyribose
27	An Introduction to disaccharides(maltose, sucrose, lactose)
28	Polysaccharides(starch and cellulose) without involving structure determination
29	Organomagnesium compounds: the Grignard reagents-formation
30	Structure and chemical reactions
31	Organozinc compounds: Formation and chemical reactions
32	Organolithium compounds: Formation and chemical reactions



RPS Degree College, Balana (Mahendergarh)

Syllabus Plan

2020-21(Odd Semester)

Class and Section: B.Sc. 5th Non Medical

Subject: Physical Chemistry

Lecture	Topics
1	Introduction to Syllabus, Scheme of Exam
2	black body radiation
3	spectral distribution of black body radiation
4	Planck's radiation law
5	photoelectric effect
6	Compton effect
7	Schrödinger wave equation
8	eigen values and eigen function
9	operators
10	algebra of operator
11	examples of operator
12	born interpretation and wave function
13	postulates of quantum mechanics
14	difference between classical and quantum mechanics
15	particle in 1 dim box
16	physical properties of solids
17	optical activity and it's examples
18	clausius mosotti equation
19	magnetic properties
20	gouys method
21	dielectric properties of solids
22	introduction to spectra
23	width and intensity
24	types of spectra and radiation's used
25	born openheimer approximation
26	introduction to rotational spectra
27	rigid rotor
28	non rigid rotor
29	application of rotational spectra
30	numerical problems
31	introduction to vibrational spectra
32	harmonic oscillator
33	anharmonic oscillator
34	hot band , overtone, fundamental bands
35	types of vibrations
36	introduction to raman spectra

37	rotational Raman spectra
38	vibrational Raman spectra
39	numerical
40	previous years question paper solution
41	revision and problems

RPS Degree College, Balana (Mahendergarh)



Lesson Plan 2020-21(Odd Semester)

Class and Section: B.Sc. Non Medical 5th Sem.

Subject: Real Analysis , BM-351

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 Non Medical 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. Non Medical 5th Sem.

Subject: Numerical Analysis (Code: BHM112)

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



Lesson plan

Class and Section: B.Sc Physics, Semester 5th

Subject: Paper I: Quantum Mechanics (PHY-501)

Lectures	Topics
1.	Introduction to classical mechanics (Unit I)
2.	Failure of classical E. M. Theory
3.	Old quantum theory
4.	Photon and its properties
5.	Photoelectric effect
6.	Continue...
7.	Einstein's Photoelectric equation
8.	Continue...
9.	Numericals of photoelectric effect
10.	Compton effect (theory)
11.	Compton effect (result)
12.	Numericals of Compton effect
13.	Inadequacy of old quantum theory
14.	de-Broglie hypothesis
15.	Numericals of de-Broglie hypothesis
16.	Davisson and Germer experiment
17.	G. P. Thomson experiment
18.	Phase velocity
19.	Group velocity
20.	Heisenberg's uncertainty principle
21.	Time-energy and angular momentum-angle uncertainty
22.	Uncertainty principle from de-Broglie wave particle duality
23.	Gamma ray microscope experiment
24.	Electron diffraction from a slit
25.	Test
26.	Basic introduction to wave function (Unit-II)
27.	Derivation of time dependent Schrodinger wave equation in one dimension
28.	Derivation of time dependent Schrodinger wave equation in three dimensions
29.	Eigen values and eigen functions
30.	Wave function and its significance
31.	Normalization of wave function
32.	Numericals of normalization of wave functions
33.	Concept of observable and operator
34.	Expectation value of a variable
35.	Numericals of expectation value and probability density
36.	Solution of Schrodinger equation for harmonic oscillator ground state
37.	Continue...
38.	Solution of Schrodinger equation for harmonic oscillator excited state
39.	Continue...

40.	Test
41.	Basic introduction to applications of Schrodinger wave equation (Unit-III)
42.	Free particle in one dimensional box
43.	One dimensional potential barrier, $E > V$
44.	Continue...
45.	One dimensional potential barrier, $E < V$
46.	Continue...
47.	Test
48.	Test distribution and discussion
49.	(Revision) & discussion of previous paper (Unit I)
50.	(Revision) & discussion of previous paper (Unit II)
51.	(Revision) & discussion of previous paper (Unit III)

Class:- B. Sc. Non Medical 5th Sem.

Subject Name:- SOLID STATE PHYSICS (PHY-502)

Lectures	Particular
1.	SUBJECT INTRODUCTION
2.	COURSE INTRODUCTION
3.	INTRODUCTION UNIT 1
4.	CRYSTAL LATTICE, BASIS
5.	CRYSTAL STRUCTURE
6.	2D AND 3D BRAVAIS LATTICE
7.	TYPES OF SOLIDS
8.	CRYSTALLINE AND NON CRYSTALLINE
9.	LIQUID CRYSTAL
10.	MILLER INDICES MILLER PLANES
11.	MILLER DIRECTIONS NUMERICALS
12.	MILLER INDICES PROBLEM
13.	INTER PLANAR SPACING
14.	BCC FCC SC UNIT CELL PRIMITIVE CELL
15.	EFFECTIVE NO. OF ATOMS PACKING FRACTION
16.	1 UNIT TEST
17.	HCP DISCUSSION
18.	CO. NO. PACKING FRACTION
19.	C/A RATIO OF HCP
20.	JANMASTMI HOLIDAY
21.	X RAY DIFFRACTION
22.	IMPORTANCE OF X RAY DIFFRACTION
23.	BRAGGS LAW
24.	LAUE X RAY DIFFRACTION ROTATING CRYSTAL DIFFRACTION
25.	POWDER METHOD
26.	K SPACE
27.	RECIPROCAL LATTICE SPACE
28.	RPL SIGNIFICANCE AND CONSTRUCTION
29.	RECIPROCAL LATTICE VECTORS RPL TO SC
30.	RPL TO FCC RPL TO BCC
31.	2 UNIT TEST
32.	SPECIFIC HEAT OF SOLIDS
33.	MHATMA GANDHI JYANTI
34.	EINSTEIN THEORY OF SP INTRO
35.	ETSP COMPLETE

36.	DEBYE THEORY INRO
37.	DEBYE THEORY COMPLETE
38.	RIVISION BRAVAIS LATTICE
39.	RIVISION RPL
40.	RIVISION INTER PLANNER SPACING
41.	RIVISION
42.	RIVISION
43.	NUMERICAL ON BRAGGS LAW
44.	NUMERICALS ON INTWER PLANNER SPACING
45.	RIVISION
46.	3 UNIT TEST
47.	TEST DISCUSSION
48.	PRIVIOUS YEAR PAPER
49.	PRIVIOUS YEAR PAPER
50.	PRIVIOUS YEAR PAPER
51.	PRIVIOUS YEAR PAPER