



# RPS Degree College, Balana (Mahendergarh)

## Lesson Plan

2020-21(Odd Semester)

**Class and Section: HC 5th**

**Subject: Inorganic Chemistry**

**Name of the Faculty : Dr. Prashant Kumar**

Lecture	Topics
1	Introduction to Syllabus
2	Defination of Organomettalic compound,Classification of OMC
3	Classification of OMC
4	Classification of OMC
5	Structure and bonding of metal ethylenic complex
6	Structure and bonding of metal ethylenic complex
7	Structure and bonding of metal acetylenic complex
8	Structure and bonding of metal acetylenic complex
9	Structure and bonding of metal carbonyl
10	Structure and bonding of metal carbonyl
11	Homogenous catalysis
12	Homogenous catalysis
13	Catalysis cycle of hydrogenation
14	Catalysis cycle for hydrogenation
15	Catalysis cycle for hydroformylation
16	Catalysis cycle for hydroformylation
17	Catalysis cycle for methanol carbonylation
18	Catalysis cycle for methanol carbonylation
19	Polymerization Reactions
20	Polymerization Reactions
21	Polymerization Reactions
22	Polymerization Reactions
23	Metathesis Reaction of alkenes
24	Metathesis Reaction of alkenes
25	Metathesis Reaction of alkenes
26	Metathesis Reaction of alkynes
27	Metathesis Reaction of alkynes
28	Metathesis Reaction of alkynes
29	Ziegler-Natta polymerization of ethylene
30	Ziegler-Natta polymerization of ethylene
31	Ziegler-Natta polymerization of propylene
32	Ziegler-Natta polymerization of propylene
33	Ziegler-Natta polymerization of propylene
34	Essential and Trace elements in biological process

35	Essential and Trace elements in biological process
36	Essential and Trace elements in biological process
37	Essential and Trace elements in biological process
38	Bioinorganic Chemistry of Haemoglobin
39	Bioinorganic Chemistry of Haemoglobin
40	Bioinorganic Chemistry of Haemoglobin
41	Bioinorganic Chemistry of Myoglobin
42	Bioinorganic Chemistry of Myoglobin
43	Bioinorganic Chemistry of Myoglobin
44	Vit. B12, Carboxypeptidase
45	Nitrogen Fixation
46	Nitrogen Fixation
47	Nitrogen Fixation
48	Biological role of alkaline earth metal
49	Biological role of alkaline earth metal
50	Biological role of alkali metal



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## Lesson Plan

2020-21(Odd Semester)

**Class and Section: Hons. Chemistry 5th Sem**

**Subject: Inorganic Chemistry**

**Name of the Faculty : Dr. Vikas Sangwan**

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 and Kinetic stability of complexes
17	Stability Constant
18	Kinetic and thermodynamic stability
19	Factors affecting stability
20	Substitution reactions in square planar complexes
21	Rate law
22	Types of substitution reactions
23	Trans influence
24	Trans effect
25	Theories of trans effect
26	Revision
27	SECTION B: Magnetic properties of Transition Metal Complexes
28	LS coupling ,Measurement of magnetic susceptibility
29	Measurement of magnetic susceptibility
30	Relation between magnetic susceptibility and magnetic moment
31	Variation of magnetic susceptibility with temperature
32	Orbital contribution to magnetic moment
33	Neels Temperature, Curies Temperature and TIP
34	Magnetic behavior of 3d metal complexes & Anomalous magnetic moment

35	Revision
36	SECTION C: Electronic Spectra of Metal Complexes
37	Types of Electronic transitions
38	Term symbols and coupling schemes
39	Selection rules
40	Splitting of states in Octahedral and Tetrahedral fields
41	Splitting of states in Octahedral and Tetrahedral fields
42	Spectrochemical series
43	Orgel energy level diagrams
44	Electronic Spectra of complex ions
45	discussion of the electronic spectrum of $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$ complex ion.
46	discussion of the electronic spectrum of $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$ complex ion.
47	SECTION C: Hard and Soft Bases
48	Classification of acid and bases as Hard and Soft
49	Pearson HSAB Concept
50	Acid -base strength
51	Hardness and Softness
52	Symbiosis & Theoretical basis of Hardness and Softness
53	Electronegativity and its effect on Hardness & Softness
54	Revision
55	SECTION D: Silicones, Phosphazenes and S-N Compounds
56	Synthesis and properties of Silicones
57	Nature of bonding in Silicones and its applications
58	Synthesis and properties of Phosphazenes & S-N Compounds
59	Nature of bonding in Phosphazenes & S-N Compounds and its applications
60	Revision



# RPS Degree College, Balana (Mahendergarh)

## Lesson Plan

2020-21(Odd Semester)

Class and Section: B.Sc Hons Chemistry 5th sem

Subject: Organic Chemistry

Name of the Faculty : Renu Sharma

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
33	Introduction to organo sulphur compounds

34	Thiols , structure and bonding
35	properties of thiols, methods of preparation
36	thioether-structure and bonding
37	methods of preparation of thio ethers
38	sulphaguanidines
40	sulphonamides
41	detergents
42	cleansing action of soap and detergents
43	introduction to mass spectrometry
44	principle of mass spectrometry
45	M/Z ratio
46	molecular peak,base peak
47	fragmentation of alkanes
48	fragmentation of alkenes
50	fragmentation of benzene
51	fragmentation of substituted benzene
52	MAc Lafferty Rearrangement
53	Combine problems of mass and NMR



# RPS Degree College, Balana (Mahendergarh)

## Lesson Plan

2020-21(Odd Semester)

**Class and Section: B. Sc (H) CHEMISTRY 5th**

**Subject : Organic Chemistry**

**Name of the Faculty : Mr. Narender Saini**

Lecture	Topics
1	Heterocyclic Compounds
2	aromatic characteristics of pyrrole, furan, thiophene and pyridine
3	Methods of synthesis Of pyrrole, furan
4	Methods of synthesis Of thiophene, pyridine
5	chemical reactions with particular emphasis on the mechanism of electrophilic substitution.
6	Mechanism of nucleophilic substitution reactions in pyridine derivatives.
7	Comparison of basicity of pyridine, piperidine and pyrrole.
8	Introduction to condensed five and six- membered heterocycles. Preparation and reactions of indole, quinoline and isoquinoline
9	Fisher indole synthesis, Skraup synthesis and Bischler- Napieralski synthesis.
10	Mechanism of electrophilic substitution reactions of indole, quinoline and isoquinoline
11	Mechanism of electrophilic substitution reactions of indole, quinoline and isoquinoline
12	Class test
13	1 . Organo Phosphorus Compounds: Nomenclature, Trivalent phosphorus compounds - trialkyl and triaryl phosphine
14	Penta valent phosphorus compounds, organic phosphoranes, phosphorus ylides,
15	wittig reaction. Biological role of phosphorus.
16	Polymers : Brief history of macromolecular Science, Natural polymers: Starch, cellulose
17	Classification, types of polymerisation: Addition, condensation and their mechanisms(free radical, ionic
18	coordination-ZieglerNattaCatalyst),methodsof polymerisation - bulk suspension, emulsion and solution.
19	(I)Phenol formaldehydes resins. (II)Urea formaldehydes resins.
20	(III)Polyesters (IV)Polyamides.
21	(V)Natural and synthetic rubbers

22	Class test
23	Organic Synthesis via Enolates
24	Synthesis of ethyl acetoacetate: the Claisen condensation. Keto- enol tautomerism of ethyl acetoacetate.
25	Alkylation of 1,3-dithianes. Alkylation and acylation of enamines
26	Synthetic Dyes Colour and constitution (electronic concept). Classification of dyes.
27	Chemistry and synthesis of Methyl orange,
28	Congo red, Malachite green, Crystal violet,
29	Phenolphthalein, Fluorescein, Alizarin and Indigo
30	Class test
31	Classification, structure and stereochemistry of amino acids. Acid-base behavior, isoelectric point
32	electrophoresis. Preparation and reactions of $\alpha$ - amino acids.
33	Structure and nomenclature of peptides and proteins. Classification of proteins. Peptide structure determination,
34	end group analysis, selective hydrolysis of peptides. Classical peptide synthesis, solid – phase peptide synthesis.
35	Structures of peptides and proteins. Levels of protein structure. Protein denaturation/ renaturation.
36	Purines and pyrimidines: Introduction to purines and pyrimidines, preparation and reactions of adenine,
37	guanine, cytosine, uracil, thymine,
38	tautomerism in purines and pyrimidines.
39	Nucleic acids: introduction. Constituents of nucleic acids.
40	Ribonucleosides and ribonucleotides
41	The double helical structure of DNA.
42	Class test





# RPS Degree College, Balana (Mahendergarh)

## Lesson Plan

2020-21(Odd Semester)

**Class and Section: B.Sc HC 5th Sem**

**Subject: Physical Chemistry Paper 1**

**Name of the Faculty : Ms. Vandana**

Lecture	Topics
1	introduction of solution
2	methods of expressing concentration of solution
3	methods of expressing concentration of solution
4	activity and activity coefficient
5	partial molar quantities and chemical potential
6	ideal and non ideal solution
7	dilute solution and definition of colligative properties
8	raoult's law
9	relative lowering of vapour pressure
10	molecular weight determination
11	osmotic law of osmotic pressure and its measurements
12	determination of molecular weight by osmotic pressure method
13	elevation of boiling point and depression in freezing point
14	thermodynamic derivation of relation between molecular weight and elevation in boiling point
15	thermodynamic derivation of relation between molecular weight and depression in freezing point
16	experimental methods for determining various colligative properties
17	abnormal molar mass
18	degree of dissociation and Association of solutes
19	introduction of rotational spectroscopy
20	introduction of electromagnetic radiations and regions of the spectrum and basic features of different spectrometers
21	statement of the born open heimer approximation
22	degree of freedom of diatomic molecule
23	energy level of a rigid rotor selection rule and spectral intensity
24	distribution using population distribution
25	determination of Bond length
26	qualitative description of non rigid rotator and isotopic effect
27	introduction of phase equilibrium

28	statement and meaning of the terms phase component and degree of freedom
29	Phase rule and its thermodynamics derivation
30	phase equilibria of one component system water and sulphur system
31	phase equilibria of two component system
32	solid- liquid equilibria ,simple eutetic ,de-solventisation of lead
33	solid solution compound formation with congruent melting point and incongruent melting point
34	introduction of photochemistry
35	interaction of radiation with matter
36	photochemical reactions and their difference with thermal reaction law of photochemistry
37	grothus, drapper law, Stark einstein law
38	Lambert law, beers law
39	Jablonski diagram depicting various processes appearing in the excited state
40	qualitative description of fluorescence
41	qualitative description of phosphorescence
42	non radiation processes
43	Quantum yield photosensitized reactions
44	energy transfer processes



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2020-21 (Odd Semester)

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