Session 2019-20 (Odd semester)

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor : Dr. Kuldeep Mahiya

Class: B.Sc. III (5 th Semester)	Section:	B
Subject: Inorganic Chemistry Theory	Paper:	CH-301

Chapter –I Metal- Ligand Bonding in Transition Metal complexes
week 1, 16/0//2019 – 20/0//2019
• 1.1 Introduction
• 1.2 Overview of valence bond theory (VBT) and its limitations
Week 2, 22/07/2019 – 27/07/2019
• 2 Brief revision of previous week topics
• 2.1 Shape of <i>d</i> -orbitals and elementary ideas of crystal field theory (CFT)
2.2 Crystal field splitting in octahedral field
Week 3 $29/07/2019 = 03/08/2019$
• 3 Brief revision of previous week topics
 3 Dreview of previous week topics 3 1 Crystal field splitting in tetrahedral field
 3.1 Crystal field splitting in curated a field splitting in square planar field
• 5.2 Tetragonal distortion and crystal field splitting in square planal field
Week 4, 05/08/2019 – 10/08/2019
• 4 Brief revision of previous week topics
• 4.1 Crystal field splitting in trigonal bipyramidal field
4.2 Calculation of CFSE for various crystal fields
Week 5 12/08/2019 - 17/08/2019
• 5 Brief revision of previous week topics
 5.1 CFT and magnetic properties of complexes
 5.2 Factors determining the magnitude of CESE
Week 6, 19/08/2019 – 24/08/2019
6 Brief revision of previous week topics
• 6.1 Colour in transition metal complexes
6.2 Limitation of CFT and comparison with VBT
$W_{00} = 7.26/08/2010 = 21/08/2010$
• 7 Brief revision of previous week topics
 7 Dher revision of previous week topics 7 1 Pavision of chapter
 7.1 Revision of chapter 7.2 Problem solution and question answers
Chapter II Thermodynamics and Kinetic Aspects of metal complexes
Week 8, 02/09/2019 – 07/09/2019
• 1.1 Thermodynamic stability of complexes

• 1.2 Kinetic and thermodynamic stability
Week $9,00/00/2010,14/00/2010$
 2 Brief revision of previous week topics
 2 Drief revision of previous week topics 2 1 Eactors affecting the stability of complexes
 2.1 Factors ancesting the stability of complexes 2.2 Substitution reactions in square planar complexes
 Minor test
• White test
Week 10, 16/09/2019 – 21/09/2019
• 3 Brief revision of previous week topics
• 3.1 Trans effect
3.2 Mechanism of nucleophilic substitution in square planar complexes
Week 11 $23/00/2010 = 28/00/2010$
• A Brief revision of previous week topics
 4 Theories of trans effect
 4.2 Problem solution and question answers
Chapter III Magnetic properties of Transition metal complexes
Week 12, 30/09/2019 – 05/10/2019
 1.1 Magnetic properties of transition metals
1.2 Measurement of magnetic properties and magnetic moment
$W_{ack} = 12,07/10/2010, 12/10/2010$
• 2 Priof region of provious weak topics
 2 Bher revision of previous week topics 2 1 Variation of magnetic suscentibility with temperature
 2.1 Variation of magnetic susceptionity with temperature 2.2 Ferromagnetism and Antiferromagnetism
• 2.2 Performagnetism and Anthenomagnetism
Week 14, 14/10/2019 – 19/10/2019
• 3 Brief revision of previous week topics
• 3.1 Orbital contribution to magnetic moment
• 3.2 Quenching of orbital angular momentum in Oh and Th complexes
Week 15, $21/10/2019 - 26/10/2019$
• 4 Brief revision of previous week topics
 4.1 HP 4.2 Problem solution and question ensures
• 4.2 Problem solution and question answers
Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)
Chapter IV Electronic spectra of Transition metal complexes
Week 16, 28/10/2019 – 02/11/2019
• 1.1 Term symbols and coupling scheme
• 1.2 Spectroscopic term symbols and ground state terms

Week 17, 04/11/2019 – 09/11/2019

- 2 Brief revision of previous week topics
- 2.1Calculation of microstates
- 2.2 Russell Saunders states in Oh and Th crystal fields
- 2.3 Spectrochemical series

Week 18, 11/11/2019 - 16/11/2019

- 3 Brief revision of previous week topics
- 3.1 Orgel diagrams
- 3.2 Tanabe-Sugano diagrams

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor : Dr. Kuldeep Mahiya

Class: B.Sc. II (3rd Semester) Subject: Organic Chemistry-III (Theory)

Section: Α

Section	
Paper:	CCL-305

Chapter –I CARBOXYLIC ACIDS AND THEIR DERIVATIVES Week 1, 16/07/2019 – 20/07/2019 • 1.1 Introduction 1.2 Nomenclature of acids and derivatives • 1.3 Structure of acids and derivatives Week 2, 22/07/2019 – 27/07/2019 • 2 Brief revision of previous week topics • 2.1 Acidity of carboxylic acids • 2.2 Chemical properties of acid and acid derivatives (comparison) • 2.3 Reactions of carboxylic acids Week 3, 29/07/2019 - 03/08/2019 • 3 Brief revision of previous week topics • 3.1 Reactions of acid chloride • 3.2 Reactions of carboxylic acid anhydrides Week 4, 05/08/2019 - 10/08/2019 • 4 Brief revision of previous week topics • 4.1 Reactions of esters and amides • 4.2 Problem solution and question answers **Chapter II Amines and Diazonium salts** Week 5, 12/08/2019 - 17/08/2019 • 1.1 Introduction • 1.2 Nomenclature of amines • 1.3 Structure and basic character Week 6, 19/08/2019 – 24/08/2019 • 2 Brief revision of previous week topics • 2.1 Methods of preparation • 2.2 Chemical reactions of amines Week 7, 26/08/2019 - 31/08/2019 • 3 Brief revision of previous week topics • 3.1 Reactions of aromatic amines • 3.2 Aryl diazonium salts • 3.3 Problem solution and question answers **Chapter III Amino acids, Peptides and Proteins**

Week 8, 02/09/2019 - 07/09/2019

- 1.1 Introduction
- 1.2 Configuration of α-amino acids
- 1.3 Nomenclature and classification of α-amino acids

Week 9, 09/09/2019 - 14/09/2019

- 2 Brief revision of previous week topics
- 2.1 Preparation of α-amino acids
- Minor test-I

Week 10, 16/09/2019 - 21/09/2019

- 3 Brief revision of previous week topics
- 3.1 Preparation of α-amino acids (continue)
- Minor test-II

Week 11, 23/09/2019 – 28/09/2019

- 4 Brief revision of previous week topics
- 4.1 Acid-base properties
- 4.2 Isoelectronic point and separation of amino acids

Week 12, 30/09/2019 - 05/10/2019

- 5 Brief revision of previous week topics
- 5.1 Reactions of amino acids
- 5.2 Geometry of peptide bond

Week 13, 07/10/2019 - 12/10/2019

- 6 Brief revision of previous week topics
- 6.1 Nomenclature of peptides
- 6.2 Solution phase peptide synthesis

Week 14, 14/10/2019 - 19/10/2019

- 7 Brief revision of previous week topics
- 7.1 Solid phase peptide synthesis
- 7.2 Structure of proteins

Week 15, 21/10/2019 - 26/10/2019

- 8 Brief revision of previous week topics
- 8.1 Structure of proteins (continue)
- 8.2 Protein denaturation
- 8.3 Classification of proteins

Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

Chapter IV Carbohydrates

Week 16, 28/10/2019 – 02/11/2019

• 1.1 Introduction

- 1.2 Carbohydrate classification
- 1.3 D and L configuration
- 1.4 Cyclic structure of monosaccharides

Week 17, 04/11/2019 - 09/11/2019

- 2 Brief revision of previous week topics
- 2.1 Reactions of monosaccharides
- 2.2 Chain lengthening and chain shortening

Week 18, 11/11/2019 - 16/11/2019

- 3 Brief revision of previous week topics
- 3.1 Determination of configuration of monosaccharides
- 3.2 Disaccharides and polysaccharides

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor : Dr. Kuldoon Mahi

Name of the Assistant/Associate Professor . Dr. Kuideep Maniya			
Class: B.Sc. II (3 rd Semester)	Groups:	A and E	
Subject: Practical-III	Paper:	CCP-309	
Section A : Physical Chemistry			
Week 1, 16/07/2019 – 20/07/2019			
Introduction			
• Do's and don't in laboratory			
• Handling of chemical and glassware			
• Maintaining of lab note book and lab record			
Solutions		-	
Week 2 22/07/2019 - 27/07/2019			
• Determination of molecular weight by Rast method (Exr	periment -1)		
 Viva-voce 	, criment 1)		
Conductance			
Wook 3 20/07/2010 03/08/2010			
 Discussion on previous week experiment 			
 Introduction to next experiment 			
 Strong acid vs. strong base (Experiment -2) 			
 Viva-voce 			
Week 4, 05/08/2019 – 10/08/2019			
 Discussion on previous week experiment 			
 Introduction to next experiment 			
• Weak acid <i>vs</i> . strong base (Experiment -3)			
• Determination of equivalent conductance of weak acid (Experiment -4)		
Viva-voce			
Phase Equilibria			
Week 5, 12/08/2019 - 17/08/2019			
• Discussion on previous week experiment			
• Introduction to next experiment			
• Determination of CST of Phenol water system (Experim	ent -5)		
Viva-voce	,		
Week 6, 19/08/2019 – 24/08/2019			
Discussion on previous week experiment			
• Introduction to next experiment			
		-	

- Effect of impurity of NaCl on CST of Phenol water system (Experiment -6)
- Viva-voce

Week 7, 26/08/2019 - 31/08/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Phase diagram of a binary system by cooling curve (Experiment -7)
- Viva-voce

Section B : Organic Chemistry

Week 8, 02/09/2019 - 07/09/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Separation of amino acids by paper chromatography (Experiment -8)
- Viva-voce

Week 9, 09/09/2019 – 14/09/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Determination of conc. of glycine by formylation method (Experiment -9)
- Viva-voce

Week 10, 16/09/2019 - 21/09/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Titration curve of glycine (Experiment -10)
- Viva-voce

Week 11, 23/09/2019 – 28/09/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Action of salivary amylase on starch and effect of temperature (Experiment -11 & 12)
- Viva-voce

Week 12, 30/09/2019 - 05/10/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Differentiation between reducing and non reducing sugars (Experiment -13)
- Viva-voce

Week 13, 07/10/2019 - 12/10/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-I (Experiment -14)
- Viva-voce

Week 14, 14/10/2019 – 19/10/2019

- Discussion on previous week experiment
- Introduction to next experiment

- Systematic qualitative organic analysis-II (Experiment -15)
- Viva-voce

Week 15, 21/10/2019 – 26/10/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-III (Experiment -16)
- Viva-voce

Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

Week 16, 28/10/2019 - 02/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-IV (Experiment -17)
- Viva-voce

Week 17, 04/11/2019 – 09/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-V (Experiment -18)
- Viva-voce

Week 18, 11/11/2019 – 16/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-VI (Experiment -19)
- Viva-voce

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor: Dr. Kuldeep Mahiya

Class: B.Sc. I (1 st Semester)	Groups:	С
Subject: Practical-I	Paper:	CCP-109
Section A : Inorganic Chemistry – Volumetric Analysis		
Week 1, 16/07/2019 – 20/07/2019		
Introduction		
 Do's and don't in laboratory 		
Week 2, 22/07/2019 – 27/07/2019		
Handling of chemical and glassware		
 Primary and secondary standard solutions 		
Viva-voce	_	
Week 3, 29/07/2019 – 03/08/2019		
• Discussion on previous week experiment		
• Preparation of solutions		
• Maintaining of lab note book and lab record		
Viva-voce		
Week 4, 05/08/2019 – 10/08/2019		
• Discussion on previous week experiment		
Introduction to next experiment	•	
• Estimation of oxalic acid by fitrating with KMnO ₄ (Expension	riment -1)	
• V1va-voce		
Week 5, 12/08/2019 - 17/08/2019		
• Discussion on previous week experiment		
Introduction to next experiment		
• Estimation of Fe ²⁺ by titrating with K ₂ Cr ₂ O ₇ using international statements of the statement of th	al indicator (Exp	periment -1)
Viva-voce		
Week 6 19/08/2019 - 24/08/2019		
Discussion on previous week experiment		
Introduction to next experiment		
 Determination of water of crystallization in Mohr salt by 	titrating with K	MnO4
(Experiment -3)		
• Viva-voce		
Week 7, 26/08/2019 - 31/08/2019		
Discussion on previous week experiment		
• Introduction to next experiment		
• Estimation of Cu^{2+} ions iodometrically (Experiment-4)		

Viva-voce	
	/2010
week 8, 02/09/2019 – 07/09	/2019
• Discussion on previo	as week experiment
• Introduction to next e	xperiment
• Estimation of carbons	ate and bicarbonate in the mixture (Experiment-5)
• Viva-voce	
Section B : Organic Chemis	stry
Week 9, 09/09/2019 – 14/09	/2019
Discussion on previo	us week experiment
• Introduction to next e	experiment
• Preparation of Lasssa	igne's extract and detection of extra elements-I (Experiment-6)
• Viva-voce	
	0/2010
Week 10, 16/09/2019 – 21/0	9/2019
• Discussion on previo	us week experiment
Introduction to next e	xperiment
• Detection of extra ele	ments-II (Experiment-7)
• Viva-voce	
Week 11, 23/09/2019 – 28/0	9/2019
Discussion on previo	us week experiment
• Introduction to next e	experiment
Detection of extra ele	ments-III (Experiment-8)
Viva-voce	
Week 12, 30/09/2019 - 05/1	0/2019
Discussion on previo	us week experiment
• Introduction to next e	xperiment
• Detection of extra ele	ments-IV (Experiment-9)
Viva-voce	
Week 13 07/10/2019 - 12/1	0/2019
Discussion on previo	us week experiment
Introduction to next e	voer experiment
 Detection of extra ele 	ments_V (Experiment_10)
Viva voce	ments- v (Experiment-10)
Week 14, 14/10/2019 – 19/1	0/2019
Discussion on previo	us week experiment
• Introduction to next e	xperiment
Viva-voce	
Week 15, 21/10/2019 – 26/1	0/2019
 Diwali vacations 	

Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

Week 16, 28/10/2019 - 02/11/2019

- Discussion on previous week experiment
- Separation of mixtures of two compounds by paper chromatography (Experiment-11)
- Viva-voce

Week 17, 04/11/2019 - 09/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Separation of mixtures of two amino acids by paper chromatography (Experiment-12)
- Viva-voce

Week 18, 11/11/2019 – 16/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Separation of mixtures of two sugars by paper chromatography (Experiment-13)
- Viva-voce

Session 2019-20 (Odd semester)

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor: Mr. Jitender Kumar

Class: B.Sc. III (5 th Semester)	Section:	B
Subject: Physical Chemistry Theory	Paper:	CH-302

Chapter –I Quantum Mechanics

Week 1, 16/07/2019 - 20/07/2019

Black-body radiation, Plank's radiation law, photoelectric effect, postulates of quantum mechanics,

Week 2, 22/07/2019 – 27/07/2019

Quantum mechanical operator s, commutation relations, Hamiltonian operator, Hermi tian operator,

Week 3, 29/07/2019 – 03/08/2019

Average value of square of Hermitian as a positive quantity, Role of operators in quantum mechanics

Week 4, 05/08/2019 - 10/08/2019To show quantum mechanically that position and momentum cannot be predicated simultaneously

Week 5, 12/08/2019 - 17/08/2019 Determination of wave function & energy of a particle in one dimensional box.

Chapter II Physical Proper ties and Molecular Structure

Week 6, 19/08/2019 – 24/08/2019 Optical activity, polarization – (Clausius – Mossotti equationderivation excluded).

Week 7, 26/08/2019 - 31/08/2019

Orientation of dipoles in an electric field, dipole moment, induced dipole moment, measurement of dipole moment -temperature method and refractivity method

Week 8, 02/09/2019 – 07/09/2019

Dipole moment and structure of molecules, Magnetic permeability, magnetic susceptibility and its de termination.

Week 9, 09/09/2019 – 14/09/2019

Applicat ion of magnetic susceptibility, magnetic properties – paramagnetism, diamagnetism and ferromagnetism.

Minor test

Chapter III Spectroscopy

Week 10, 16/09/2019 – 21/09/2019

Introduc tion: Electromagnetic radiation, regions of spectrum, basic features of spectroscopy, statement of Born-oppenheimer approximation, Degrees of freedom.

Week 11, 23/09/2019 – 28/09/2019

Selection rules, Energy levels of rigid rotator (semi-classical principles), rotational spectra of diatomic molecules.

Week 12, 30/09/2019 – 05/10/2019

Spectral intensity distribution using population distribution (Maxwell-Boltzmann distribution), determination of bond length and isotopic effect .

Week 13, 07/10/2019 – 12/10/2019

Vibrational spectrum Selection rules, Energy levels of simple harmonic oscillator, and qualitative

Week 14, 14/10/2019 – 19/10/2019

Pure vibrational spectrum of diatomic molecules, determination of force constant

Week 15, 21/10/2019 - 26/10/2019

Relation of force constant and bond energy, idea of vibrational frequencies of different functional groups.

Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

Chapter IV Electronic spectra of Transition metal complexes

Week 16, 28/10/2019 – 02/11/2019 Raman Spectrum Concept of polarizibility, pure rotational and pure vibrational

Week 17, 04/11/2019 – 09/11/2019 Raman spectra of diatomic molecules, selection rules, Quantum theory of Raman spectra.

Week 18, 11/11/2019 – 16/11/2019 Numerical Problem of all Spectroscopy

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor: Mr. Jitender Kumar

Class: B.Sc. II (3rd Semester) Subject: Physical Chemistry-II (Theory)

Section: A Paper: CCL-304

Solution

Week 1, 16/07/2019 – 20/07/2019

Solutions Thermodynamics of ideal solutions: Ideal solutions and Raoult's law

Week 2, 22/07/2019 – 27/07/2019

Deviations from Raoult's law – non-ideal solutions. Vapour pressure-composition and temperature composition curves of ideal and non-ideal solutions.

Week 3, 29/07/2019 – 03/08/2019 Distillation of solutions. Azeotropes. Colligative properties of solutions.

Week 4, 05/08/2019 – 10/08/2019 Thermodynamic derivations of relation between amount of solute and elevation in boiling point and depression in freezing point.

Week 5, 12/08/2019 - 17/08/2019 Partial miscibility of liquids: Critical solution temperature; effect of impurity on partial miscibility of liquids. Immiscibility of liquids- Principle of steam distillation.

Chapter II Phase Equilibrium

Week 6, 19/08/2019 – 24/08/2019 Phases, components and degrees of freedom of a system, criteria of phase equilibrium.

Week 7, 26/08/2019 - 31/08/2019 Derivation of Clausius – Clapeyron equation and its importance in phase equilibria.

Week 8, 02/09/2019 – 07/09/2019 Phase diagrams of one-component systems (water and sulphur) and two component systems

Week 9, 09/09/2019 - 14/09/2019

Phase Diagram involving eutectics, congruent and incongruent melting points (lead-silver, and Na-K only).

Minor test-I

Conductance

Week 10, 16/09/2019 – 21/09/2019

Conductivity, equivalent and molar conductivity and their variation with dilution for weak and strong electrolytes.

Week 11, 23/09/2019 - 28/09/2019

Kohlrausch law of independent migration of ions. Transference number, ionic mobility.

Week 12, 30/09/2019 – 05/10/2019

Applications of conductance measurements: determination of degree of ionization of weak electrolyte, solubility and solubility products of sparingly soluble salts, ionic product of water, hydrolysis constant of a salt.

Week 13, 07/10/2019 – 12/10/2019

Conductometric titrations (only acid-base). Concept of pH and pKa, buffer solution, buffer action, Handerson Hazel Blac equation. Minor test-II

Electrochemistry

Week 14, 14/10/2019 - 19/10/2019

Rversible and irreversible cells. Concept of EMF of a cell. Measurement of EMF of a cell. Nernst equation and its importance. Types of electrodes.

Week 15, 21/10/2019 – 26/10/2019 Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

Week 16, 28/10/2019 – 02/11/2019

Calculation of equilibrium constant from EMF data. Concentration cells with transference and without transference

Week 17, 04/11/2019 – 09/11/2019

Potentiometric titrations -qualitative treatment (acid-base and oxidation-reduction only). Liquid junction potential and salt bridge.pH determination using hydrogen electrode and quinhydrone electrode.

Week 18, 11/11/2019 – 16/11/2019

Standard electrode potential. Electrochemical series. Thermodynamics of a reversible cell, calculation of thermodynamic properties: ΔG , ΔH and ΔS from EMF data.

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor: Mr. Jitender Kumar

Class: B.Sc. III (5 th Semester)	Groups:	C and D
Subject: Practical-III	Paper:	CH-307

Section A : Inorganic Chemistry

Week 1, 16/07/2019 – 20/07/2019

- Introduction
- Do's and don't in laboratory
- Handling of chemical and glassware
- Maintaining of lab note book and lab record

Week 2, 22/07/2019 – 27/07/2019

Semimicro qualitative analysis of mixture containing not more than four radicals (excluding interf ering, Combinat ions and insoluables):

Pb2+, Hg2+, Hg2+, Ag+, Bi3+, Cu2+, Cd2+, As3+, Sb3+, Sn2+, Fe3+, Cr3+, Al3 + , Co2 + , Ni2 + , Mn2 + , Zn2 + , Ba2 + , Sr2 + , Ca2 + , Mg2 + , NH4+, CO3 , S2 - , SO3, S2O3 CH3COO-, Cl-, Br -, I-, NO3-3

-Viva-voce

Week 3, 29/07/2019 – 03/08/2019

Semimicro qualitative analysis of mixture containing not more than four radicals (excluding interf ering, Combinat ions and insoluables):

Pb2+, Hg2+, Hg2+, Ag+, Bi3+, Cu2+, Cd2+, As3+, Sb3+, Sn2+, Fe3+, Cr3+, Al3 + , Co2 + , Ni2 + , Mn2 + , Zn2 + , Ba2 + , Sr2 + , Ca2 + , Mg2 + , NH4+, CO3 , S2 - , SO3, S2O3 CH3COO-, Cl-, Br -, I-, NO3-3

Week 4, 05/08/2019 - 10/08/2019

Semimicro qualitative analysis of mixture containing not more than four radicals (excluding interf ering, Combinat ions and insoluables):

Pb2+, Hg2+, Hg2+, Ag+, Bi3+, Cu2+, Cd2+, As3+, Sb3+, Sn2+, Fe3+, Cr3+, Al3 +, Co2 +, Ni2 +, Mn2 +, Zn2 +, Ba2 +, Sr2 +, Ca2 +, Mg2 +, NH4+, CO3 , S2 - , SO3, S2O3 CH3COO-, Cl-, Br -, I-, NO3-

Week 5, 12/08/2019 - 17/08/2019

To determine the strength of the given acid solution (mono acid only) conductometrically. Viva-voce

Week 6, 19/08/2019 – 24/08/2019

To determine the solubility and solubility product of a sparingly soluble electrolyte conductometrically.

Viva-voce

Week 7, 26/08/2019 - 31/08/2019

To determine the strength of given Ferrous ammonium sulphate solution potentiometrically. **Section B: Physical Chemistry**

Week 8, 02/09/2019 – 07/09/2019 To determine the molecular weight of a non-volatile solute by Rast method.

Week 9, 09/09/2019 – 14/09/2019 Preparation of acidic and basic buffers and comparison of their pH with theoretical values.

Week 10, 16/09/2019 – 21/09/2019 To determine the specific rotation of optically active substance (any two).

Week 11, 23/09/2019 – 28/09/2019 To determine the specific rotation of optically active substance (any two).

Section C: Organic Chemistry

Week 12, 30/09/2019 – 05/10/2019 Determination of Rf values and identification of organic Compounds)

Week 13, 07/10/2019 – 12/10/2019 Separation of a mixture of coloured organic compounds using common organic solvents.

Week 14, 14/10/2019 – 19/10/2019 To prepare salicylic acid from Aspirin.

Week 15, 21/10/2019 – 26/10/2019 To prepare p-bromoaniline from p-bromoacetanilide.

Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

Week 16, 28/10/2019 – 02/11/2019 To prepare m-nitroaniline from m-dinitrobenzene.

Week 17, 04/11/2019 – 09/11/2019 To prepare S-Benzyl-iso-thiouronium chloride from Thiourea. Viva-voce

Week 18, 11/11/2019 – 16/11/2019 Discussion on previous week experiment Viva-voce

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor: Mr. Jitender Kumar

Class: B.Sc. I (1 st Semester)	Groups:	С
Subject: Practical-I	Paper:	CCP-109
Section A : Inorganic Chemistry – Volumetric Analy	rsis	
Week 1, 16/07/2019 – 20/07/2019		
• Introduction		
• Do's and don't in laboratory		
Week 2. 22/07/2019 - 27/07/2019		
• Handling of chemical and glassware		
 Primary and secondary standard solutions 		
Viva-voce		
Week 3 $29/07/2019$ $03/08/2019$		
Discussion on previous week experiment		
 Preparation of solutions 		
 Maintaining of lab note book and lab record 		
 Viva-voce 		
Week 4, 05/08/2019 – 10/08/2019		
 Discussion on previous week experiment 		
 Introduction to next experiment 		
• Estimation of oxalic acid by titrating with KMn0	D ₄ (Experiment -1)	
Viva-voce		
Week 5, 12/08/2019 - 17/08/2019		
• Discussion on previous week experiment		
• Introduction to next experiment		
• Estimation of Fe ²⁺ by titrating with K ₂ Cr ₂ O ₇ usir	ng internal indicator (E	Experiment -1)
Viva-voce		
Week 6 19/08/2019 - 24/08/2019		
Discussion on previous week experiment		
 Introduction to next experiment 		
 Determination of water of crystallization in Moh 	r salt by titrating with	KMnO ₄
(Experiment -3)	,	
Viva-voce		
Week 7, 26/08/2019 - 31/08/2019		
• Discussion on previous week experiment		
• Introduction to next experiment		
 Estimation of Cu²⁺ ions iodometrically (Experim 	nent-4)	

• Estimation of Cu²⁺ ions iodometrically (Experiment-4)

٠	Viva-voce
Week	8 02/09/2019 - 07/09/2019
•	Discussion on previous week experiment
•	Introduction to next experiment
•	Estimation of carbonate and bicarbonate in the mixture (Experiment-5)
•	Viva-voce
Sectio	on B : Organic Chemistry
Week	<u>9,09/09/2019 – 14/09/2019</u>
•	Discussion on previous week experiment
•	Introduction to next experiment
•	Preparation of Lasssaigne's extract and detection of extra elements-I (Experiment-6)
•	Viva-voce
Week	x 10, 16/09/2019 - 21/09/2019
•	Discussion on previous week experiment
•	Introduction to next experiment
•	Detection of extra elements-II (Experiment-7)
•	Viva-voce
Wook	11 23/09/2019 - 28/09/2019
•	Discussion on previous week experiment
•	Introduction to next experiment
•	Detection of extra elements-III (Experiment-8)
•	Viva-voce
Week	x 12, 30/09/2019 - 05/10/2019
•	Discussion on previous week experiment
•	Introduction to next experiment
•	Detection of extra elements-IV (Experiment-9)
•	Viva-voce
Wook	13 07/10/2010 - 12/10/2010
VV CCM	Discussion on provious work experiment
	Introduction to next experiment
•	Detaction of extra elements V (Experiment 10)
•	Vive voce
	viva-voce
Week	: 14, 14/10/2019 – 19/10/2019
•	Discussion on previous week experiment
	Introduction to next experiment
•	introduction to next experiment

• Diwali vacations

Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

Week 16, 28/10/2019 – 02/11/2019

- Discussion on previous week experiment
- Separation of mixtures of two compounds by paper chromatography (Experiment-11)
- Viva-voce

Week 17, 04/11/2019 – 09/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Separation of mixtures of two amino acids by paper chromatography (Experiment-12)
- Viva-voce

Week 18, 11/11/2019 – 16/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Separation of mixtures of two sugars by paper chromatography (Experiment-13)
- Viva-voce

Session 2019-20 (Odd semester)

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor : Mr. Shyam Lal

Class: B.Sc. III (5 th Semester)	Section:	B
Subject: Organic Chemistry Theory	Paper:	СН-303

Chapter –I NMR Spectroscopy
 Week 1, 16/07/2019 – 20/07/2019 1. Introduction 1.1 Scheme and Syllabus
Week 2, 22/07/2019 – 27/07/2019 • 2 Principle of nuclear magnetic resonance • 2.1 PMR
 Week 3, 29/07/2019 – 03/08/2019 3 Brief revision of previous week topics 3.1 spectrum,number of signals, peak areas 3.2 equivalent and nonequivalent protons
 Week 4, 05/08/2019 – 10/08/2019 4 Brief revision of previous week topics 4.1 positions of signals and chemical shift, shielding and deshielding of protons 4.2 proton counting, splitting of signals and coupling constants
 Week 5, 12/08/2019 - 17/08/2019 5 Magnetic equivalence of protons 5.1 Discussion of PMR spectra of the molecules: ethyl bromide, n-propyl bromide, isopropyl bromide,
 Week 6, 19/08/2019 – 24/08/2019 6 Brief revision of previous week topics 6.1 Discussion of PMR spectra of the molecules:1,1-dibromoethane, ethanol, acetaldehyde, ethyl acetate, toluene, benzaldehyde and acetophenone
 Week 7, 26/08/2019 - 31/08/2019 7 Brief revision of previous week topics 7.1 Simple problems on PMR spectroscopy for structure determination of organic compounds. 7.2 Problem solution and question answers Chapter II Carbohydrates
 Week 8, 02/09/2019 – 07/09/2019 1 Classification and nomenclature of Monosaccharides

• 1.1 mechanism of osazone formation

Week 9, 09/09/2019 – 14/09/2019

- 2 Brief revision of previous week topics
- 2.1 interconversion of glucose and fructose
- 2.2 chain lengthening and chain shortening of aldoses
- Minor test

Week 10, 16/09/2019 – 21/09/2019

- 3 Brief revision of previous week topics
- 3.1 Configuration of monosaccharides. Erythro and threo diastereomers
- 3.2 Conversion of glucose into mannose

Week 11, 23/09/2019 - 28/09/2019

- 4 Brief revision of previous week topics
- 4.1 Formation of glycosides
- 4.2 Problem solution and question answers

Week 12, 30/09/2019 - 05/10/2019

- 5 Determination of ring size of glucose and fructose
- 5.1 Open chain and cyclic structure of D(+)-glucose & D(-) fructose
- 5.2 Measurement of magnetic properties and magnetic moment

Week 13, 07/10/2019 - 12/10/2019

- 6 Brief revision of previous week topics
- 6.1 Mechanism of mutarotation. Structures of ribose and deoxyribose
- 6.2 An introduction to disaccharides (maltose, sucrose and lactose)

Week 14, 14/10/2019 – 19/10/2019

- 7 Brief revision of previous week topics
- 7.1 polysaccharides (starch and cellulose)

CHAPTER III:Organometallic Compounds

Week 15, 21/10/2019 – 26/10/2019

- 1 Brief revision of previous week topics
- 1.1 Organomagnesium compounds: the Grignard reagents-formation
- 1.2 Problem solution and question answers

Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

Week 16, 28/10/2019 – 02/11/2019

• 2 Structure and chemical reactions 2.1 Organozinc compounds: formation and chemical reactions

Week 17, 04/11/2019 – 09/11/2019

- 3 Brief revision of previous week topics
- 3.1 Organolithium compounds: formation and chemical reactions.

Week 18, 11/11/2019 – 16/11/2019

• 4 Brief revision of previous week topics..

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor : Mr. Shyam Lal

Class: B.Sc. II (3rd Semester) Subject: Organic Chemistry-III (Theory)

Section: B Paper: CCL-305

Chapter –I CARBOXYLIC ACIDS AND THEIR DERIVATIVES
Week 1, 16/0//2019 – 20/0//2019
• 1.1 Introduction
• 1.2 Nomenclature of acids and derivatives
• 1.3 Structure of acids and derivatives
Week 2 $22/07/2019 = 27/07/2019$
• 2 Brief revision of previous week topics
 2 Direct revision of previous week topics 2 1 Acidity of carboxylic acids
 2.1 Actuary of carboxyne actus 2.2 Chemical properties of acid and acid derivatives (comparison)
 2.2 Chemical properties of acid and acid derivatives (comparison) 2.3 Reactions of carboxylic acids
Week 3, 29/07/2019 – 03/08/2019
• 3 Brief revision of previous week topics
• 3.1 Reactions of acid chloride
• 3.2 Reactions of carboxylic acid anhydrides
Week 4, 05/08/2019 – 10/08/2019
• 4 Brief revision of previous week topics
• 4.1 Reactions of esters and amides
• 4.2 Problem solution and question answers
Chapter II Amines and Diazonium salts
Week 5, 12/08/2019 - 17/08/2019
• 1.1 Introduction
• 1.2 Nomenclature of amines
1.3 Structure and basic character
Week 6, 19/08/2019 – 24/08/2019
• 2 Brief revision of previous week topics
• 2.1 Methods of preparation
2.2 Chemical reactions of amines
Week 7, 26/08/2019 - 31/08/2019
• 3 Brief revision of previous week topics
• 3.1 Reactions of aromatic amines
• 3.2 Aryl diazonium salts
• 3.3 Problem solution and question answers

Chapter III Amino acids, Peptides and Proteins

Week 8, 02/09/2019 - 07/09/2019

- 1.1 Introduction
- 1.2 Configuration of α-amino acids
- 1.3 Nomenclature and classification of α-amino acids

Week 9, 09/09/2019 - 14/09/2019

- 2 Brief revision of previous week topics
- 2.1 Preparation of α-amino acids
- Minor test-I

Week 10, 16/09/2019 - 21/09/2019

- 3 Brief revision of previous week topics
- 3.1 Preparation of α-amino acids (continue)
- Minor test-II

Week 11, 23/09/2019 – 28/09/2019

- 4 Brief revision of previous week topics
- 4.1 Acid-base properties
- 4.2 Isoelectronic point and separation of amino acids

Week 12, 30/09/2019 - 05/10/2019

- 5 Brief revision of previous week topics
- 5.1 Reactions of amino acids
- 5.2 Geometry of peptide bond

Week 13, 07/10/2019 - 12/10/2019

- 6 Brief revision of previous week topics
- 6.1 Nomenclature of peptides
- 6.2 Solution phase peptide synthesis

Week 14, 14/10/2019 - 19/10/2019

- 7 Brief revision of previous week topics
- 7.1 Solid phase peptide synthesis
- 7.2 Structure of proteins

Week 15, 21/10/2019 - 26/10/2019

- 8 Brief revision of previous week topics
- 8.1 Structure of proteins (continue)
- 8.2 Protein denaturation
- 8.3 Classification of proteins

Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

Chapter IV Carbohydrates

Week 16, 28/10/2019 – 02/11/2019

• 1.1 Introduction

- 1.2 Carbohydrate classification
- 1.3 D and L configuration
- 1.4 Cyclic structure of monosaccharides

Week 17, 04/11/2019 - 09/11/2019

- 2 Brief revision of previous week topics
- 2.1 Reactions of monosaccharides
- 2.2 Chain lengthening and chain shortening

Week 18, 11/11/2019 - 16/11/2019

- 3 Brief revision of previous week topics
- 3.1 Determination of configuration of monosaccharides
- 3.2 Disaccharides and polysaccharides

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor : Mr Shyam Lal

Class: B.Sc. II (3 rd Semester) Subject: Practical-III	Groups: Paper:	A and E CCP-309
Section A : Physical Chemistry		
 Week 1, 16/07/2019 - 20/07/2019 Introduction Do's and don't in laboratory Handling of chemical and glassware Maintaining of lab note book and lab record Solutions Week 2, 22/07/2019 - 27/07/2019		
 Determination of molecular weight by Rast method (E: Viva voce 	xperiment -1)	
Conductance		
 Week 3, 29/07/2019 - 03/08/2019 Discussion on previous week experiment Introduction to next experiment Strong acid <i>vs.</i> strong base (Experiment -2) Viva-voce 		
 Week 4, 05/08/2019 – 10/08/2019 Discussion on previous week experiment Introduction to next experiment Weak acid vs. strong base (Experiment -3) Determination of equivalent conductance of weak acid Viva-voce 	(Experiment -4)	
Phase Equilibria		
 Week 5, 12/08/2019 - 17/08/2019 Discussion on previous week experiment Introduction to next experiment Determination of CST of Phenol water system (Experiment Viva-voce 	ment -5)	
 Week 6, 19/08/2019 – 24/08/2019 Discussion on previous week experiment Introduction to next experiment Effect of impurity of NaCl on CST of Phenol water system 	stem (Experiment	-6)

• Viva-voce

Week 7, 26/08/2019 - 31/08/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Phase diagram of a binary system by cooling curve (Experiment -7)
- Viva-voce

Section B : Organic Chemistry

Week 8, 02/09/2019 - 07/09/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Separation of amino acids by paper chromatography (Experiment -8)
- Viva-voce

Week 9, 09/09/2019 – 14/09/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Determination of conc. of glycine by formylation method (Experiment -9)
- Viva-voce

Week 10, 16/09/2019 - 21/09/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Titration curve of glycine (Experiment -10)
- Viva-voce

Week 11, 23/09/2019 – 28/09/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Action of salivary amylase on starch and effect of temperature (Experiment -11 & 12)
- Viva-voce

Week 12, 30/09/2019 - 05/10/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Differentiation between reducing and non reducing sugars (Experiment -13)
- Viva-voce

Week 13, 07/10/2019 - 12/10/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-I (Experiment -14)
- Viva-voce

Week 14, 14/10/2019 – 19/10/2019

- Discussion on previous week experiment
- Introduction to next experiment

- Systematic qualitative organic analysis-II (Experiment -15)
- Viva-voce

Week 15, 21/10/2019 – 26/10/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-III (Experiment -16)
- Viva-voce

Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

Week 16, 28/10/2019 - 02/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-IV (Experiment -17)
- Viva-voce

Week 17, 04/11/2019 – 09/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-V (Experiment -18)
- Viva-voce

Week 18, 11/11/2019 – 16/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-VI (Experiment -19)
- Viva-voce

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor: Mr. Shyam Lal

Class: B.Sc. I (1 st Semester)	Groups:	С
Subject: Practical-I	Paper:	CCP-109
Section A : Inorganic Chemistry – Volumetric Analysis		
Week 1, 16/07/2019 – 20/07/2019		
Introduction		
Do's and don't in laboratory		
Week 2, 22/07/2019 – 27/07/2019		
• Handling of chemical and glassware		
• Primary and secondary standard solutions		
Viva-voce		
Week 3, 29/07/2019 – 03/08/2019		
• Discussion on previous week experiment		
Preparation of solutions		
• Maintaining of lab note book and lab record		
Viva-voce		
Week 4, 05/08/2019 – 10/08/2019		
• Discussion on previous week experiment		
Introduction to next experiment		
• Estimation of oxalic acid by titrating with KMnO ₄ (Exper	riment -1)	
Viva-voce		
Week 5, 12/08/2019 - 17/08/2019		
• Discussion on previous week experiment		
Introduction to next experiment		
• Estimation of Fe ²⁺ by titrating with K ₂ Cr ₂ O ₇ using international statements of the statement of th	al indicator (Ex	periment -1)
Viva-voce		
Week 6, 19/08/2019 – 24/08/2019		
• Discussion on previous week experiment		
Introduction to next experiment		
• Determination of water of crystallization in Mohr salt by	titrating with K	CMnO ₄
(Experiment -3)		
Viva-voce		
Week 7, 26/08/2019 - 31/08/2019		
• Discussion on previous week experiment		
Introduction to next experiment		
• Estimation of Cu ²⁺ ions iodometrically (Experiment-4)		

Viva-voce
$W_{abl} = 0.2/00/2010 = 0.7/00/2010$
week 8, $02/09/2019 - 07/09/2019$
 Discussion on previous week experiment Introduction to next experiment
 Introduction to next experiment Estimation of each onets and bicerbonets in the mixture (Experiment 5)
• Estimation of carbonate and ofcarbonate in the mixture (Experiment-3)
• viva-voce
Section D : Organic Chemistry
Week 9, 09/09/2019 – 14/09/2019
Discussion on previous week experiment
• Introduction to next experiment
• Preparation of Lasssaigne's extract and detection of extra elements-I (Experiment-6)
Viva-voce
Week 10, $16/09/2019 - 21/09/2019$
• Discussion on previous week experiment
• Introduction to next experiment
• Detection of extra elements-II (Experiment-/)
• V1va-voce
Week 11, 23/09/2019 – 28/09/2019
Discussion on previous week experiment
Introduction to next experiment
• Detection of extra elements-III (Experiment-8)
• Viva-voce
Week 12, 30/09/2019 – 05/10/2019
• Discussion on previous week experiment
• Introduction to next experiment
• Detection of extra elements-IV (Experiment-9)
• V1va-voce
Week 13, 07/10/2019 – 12/10/2019
• Discussion on previous week experiment
• Introduction to next experiment
• Detection of extra elements-V (Experiment-10)
• Viva-voce
Week 14, 14/10/2019 – 19/10/2019
• Discussion on previous week experiment
Introduction to next experiment
Viva-voce
Week 15, 21/10/2019 – 26/10/2019
• Diwali vacations

Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

Week 16, 28/10/2019 - 02/11/2019

- Discussion on previous week experiment
- Separation of mixtures of two compounds by paper chromatography (Experiment-11)
- Viva-voce

Week 17, 04/11/2019 - 09/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Separation of mixtures of two amino acids by paper chromatography (Experiment-12)
- Viva-voce

Week 18, 11/11/2019 – 16/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Separation of mixtures of two sugars by paper chromatography (Experiment-13)
- Viva-voce

Session 2019-20 (Odd semester)

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor: Dr. Prince Kumar

Class: B.Sc. III (5th Semester)

Subject: Organic Chemistry Theory

Paper: XVII (CH-303)

SECTION-A

Week 1, 16/07/2019 – 20/07/2019

• Principle of nuclear magnetic resonance, the PMR spectrum, number of signals

Week 2, 22/07/2019 – 27/07/2019

- Brief revision of previous week topics
- peak areas, equivalent and nonequivalent protons positions of signals and chemical shift

Week 3, 29/07/2019 - 03/08/2019

• shielding and deshielding of protons, proton counting

Week 4, 05/08/2019 - 10/08/2019

• splitting of signals and coupling constants, magnetic equivalence of protons

Week 5, 12/08/2019 - 17/08/2019

• Discussion of PMR spectra of the molecules: ethyl bromide, n-propyl bromide, isopropyl bromide

Week 6, 19/08/2019 – 24/08/2019

• Brief revision of previous week topics1,1-dibromoethane, ethanol, acetaldehyde, ethyl acetate, toluene, benzaldehyde and acetophenone..Simple problems on PMR spectroscopy for structure determination of organic compounds.

Week 7, 26/08/2019 - 31/08/2019

- Brief revision of previous week topics
- Problem solution and question answers

Week 8, 02/09/2019 – 07/09/2019

• 1,1-dibromoethane, ethanol, acetaldehyde, ethyl acetate, toluene, benzaldehyde and acetophenone..Simple problems on PMR spectroscopy for structure determination of organic compounds.

Week 9, 09/09/2019 - 14/09/2019

- Brief revision of previous week topics
- Minor test

Week 10, 16/09/2019 - 21/09/2019

Section-B

Classification and nomenclature of Monosaccharides, mechanism of osazone formation

Week 11, 23/09/2019 - 28/09/2019 Brief revision of previous week topics • Classification and nomenclature of Monosaccharides, mechanism of osazone formation Week 12, 30/09/2019 – 05/10/2019 interconversion of glucose and fructose, chain lengthening and chain shortening of • aldoses. Week 13, 07/10/2019 - 12/10/2019 • Brief revision of previous week topics • Configuration of monosaccharides. Erythro and threo diastereomers Week 14, 14/10/2019 - 19/10/2019 Brief revision of previous week topics • • Conversion of glucose into mannose. Formation of glycosides Week 15, 21/10/2019 - 26/10/2019 • Brief revision of previous week topics Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break) Week 16. 28/10/2019 - 02/11/2019 • Determination of ring size of glucose and fructose. Open chain and cyclic structure of D(+)-glucose & D(-) fructose. Mechanism of mutarotation. Structures of ribose and deoxyribose. Week 17, 04/11/2019 - 09/11/2019 • Brief revision of previous week topics • An introduction to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination. Week 18, 11/11/2019 - 16/11/2019 • Organomagnesium compounds: the Grignard reagents-formation, structure and chemical reactions. Organozinc compounds: formation and chemical reactions.Organolithium compounds: formation and chemical reactions.

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor: Dr. Prince Kumar

Class: B.Sc. II (3rd Semester)

Subject: PHYSICAL CHEMISTRY-II (Theory) Paper:

Subject: PHYSICAL CHEMISTRY-II (Theory)	Paper:	CCL-304
UNIT-1		
 Week 1, 16/07/2019 – 20/07/2019 Thermodynamics of ideal solutions: Ideal solutions and Rac Raoult's law – non-ideal solutions 	oult's law, d	eviations from
 Week 2, 22/07/2019 – 27/07/2019 Vapour pressure-composition and temperature composition solutions. 	curves of ic	leal and non-ideal
 Week 3, 29/07/2019 – 03/08/2019 Distillation of solutions.Azeotropes.Colligative properties of derivations of relation between amount of solute and elevation depression in freezing point 	f solutions.' on in boilin	Thermodynamic ag point and
 Week 4, 05/08/2019 – 10/08/2019 Partial miscibility of liquids: Critical solution temperature; emiscibility of liquids. Immiscibility of liquids- Principle of summiscibility of liquids- Principle of summiscibility. 	effect of imsteam distill	purity on partial lation.
 Week 5, 12/08/2019 - 17/08/2019 Phases, components and degrees of freedom of a system, critequilibrium.Gibbs Phase Rule and its thermodynamic derivation of the system. 	teria of pha	ıse
 Week 6, 19/08/2019 – 24/08/2019 Brief revision of previous week topics Derivation of Clausius – Clapeyron equation and its importation 	ance in phas	se equilibria
 Week 7, 26/08/2019 - 31/08/2019 Brief revision of previous week topics Phase diagrams of one-component systems (water and sulph systems involving eutectics, congruent and incongruent mel Na-K only). 	ur) and two ting points	component (lead-silver, and
UNIT-3		
 Week 8, 02/09/2019 – 07/09/2019 Conductivity, equivalent and molar conductivity and their v weak and strong electrolytes 	ariation wit	h dilution for
Week 9, 09/09/2019 - 14/09/2019		

• Kohlrausch law of independent migration of ions.

- Transference number, ionic mobility
- Minor test-I

Week 10, 16/09/2019 – 21/09/2019

• Applications of conductance measurements: determination of degree of ionization of weak electrolyte, solubility and solubility products of sparingly soluble salts, ionic product of water, hydrolysis constant of a salt.Minor test-II

Week 11, 23/09/2019 - 28/09/2019

• Brief revision of previous week topics

Week 12, 30/09/2019 - 05/10/2019

• Brief revision of previous week topics

Week 13, 07/10/2019 - 12/10/2019

• Brief revision of previous week topics

Week 14, 14/10/2019 – 19/10/2019

• Brief revision of previous week topics

Week 15, 21/10/2019 – 26/10/2019

• 8 Brief revision of previous week topics

Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

UNIT-4

Week 16, 28/10/2019 – 02/11/2019

- Introduction
- Reversible and irreversible cells.

Week 17, 04/11/2019 - 09/11/2019

- Brief revision of previous week topics
- Concept of EMF of a cell.Measurement of EMF of a cell.Nernst equation and its importance

Week 18, 11/11/2019 – 16/11/2019

• Types of electrodes.Standard electrode potential.Electrochemical series

LESSON PLAN (FROM JULY 2019 TO NOVEMBER 2019)

Name of the Assistant/Associate Professor: Dr. Prince Kumar

Class: B.Sc. II (3 rd Semester)	Groups:	F AND E
Subject: Practical-III	Paper:	CCP-309

Section A : Physical Chemistry Week 1, 16/07/2019 - 20/07/2019 • Introduction • Do's and don't in laboratory • Handling of chemical and glassware • Maintaining of lab note book and lab record **Solutions** Week 2, 22/07/2019 – 27/07/2019 • Determination of molecular weight by Rast method (Experiment -1) • Viva-voce Conductance Week 3, 29/07/2019 - 03/08/2019 • Discussion on previous week experiment • Introduction to next experiment • Strong acid *vs*. strong base (Experiment -2) • Viva-voce Week 4, 05/08/2019 - 10/08/2019 • Discussion on previous week experiment • Introduction to next experiment • Weak acid *vs*. strong base (Experiment -3) • Determination of equivalent conductance of weak acid (Experiment -4) • Viva-voce Phase Equilibria Week 5, 12/08/2019 - 17/08/2019 • Discussion on previous week experiment • Introduction to next experiment • Determination of CST of Phenol water system (Experiment -5) • Viva-voce Week 6, 19/08/2019 - 24/08/2019 Discussion on previous week experiment • Introduction to next experiment

- Effect of impurity of NaCl on CST of Phenol water system (Experiment -6)
- Viva-voce

Week 7, 26/08/2019 - 31/08/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Phase diagram of a binary system by cooling curve (Experiment -7)
- Viva-voce

Section B : Organic Chemistry

Week 8, 02/09/2019 - 07/09/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Separation of amino acids by paper chromatography (Experiment -8)
- Viva-voce

Week 9, 09/09/2019 – 14/09/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Determination of conc. of glycine by formylation method (Experiment -9)
- Viva-voce

Week 10, 16/09/2019 - 21/09/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Titration curve of glycine (Experiment -10)
- Viva-voce

Week 11, 23/09/2019 – 28/09/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Action of salivary amylase on starch and effect of temperature (Experiment -11 & 12)
- Viva-voce

Week 12, 30/09/2019 - 05/10/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Differentiation between reducing and non reducing sugars (Experiment -13)
- Viva-voce

Week 13, 07/10/2019 - 12/10/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-I (Experiment -14)
- Viva-voce

Week 14, 14/10/2019 – 19/10/2019

- Discussion on previous week experiment
- Introduction to next experiment

- Systematic qualitative organic analysis-II (Experiment -15)
- Viva-voce

Week 15, 21/10/2019 – 26/10/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-III (Experiment -16)
- Viva-voce

Week 15-16 (24/10/2019 – 30/10/2019 : Diwali Break)

Week 16, 28/10/2019 - 02/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-IV (Experiment -17)
- Viva-voce

Week 17, 04/11/2019 – 09/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-V (Experiment -18)
- Viva-voce

Week 18, 11/11/2019 – 16/11/2019

- Discussion on previous week experiment
- Introduction to next experiment
- Systematic qualitative organic analysis-VI (Experiment -19)
- Viva-voce

Session 2019-20 (Even semester)

LESSON PLAN (FROM JANUARY 2020 TO APRIL/MAY 2020)

Name of the Assistant/Associate Professor: Dr. Kuldeep Mahiya

Class: B.Sc. III (6 th Semester)	Section:	В
Subject: Inorganic Chemistry (Theory)	Paper:	CH-304

Chapter I Acid and Bases
$W_{00} = 1.01/01/2020 = 0.01/01/2020$
• 1 Introduction
 1 1 Overview of acid and bases
Week 2, 06/01/2020 – 11/01/2020
• 2 Brief revision of previous week topics
• 2.1 Arrhenius and Bronsted-lowry concept of acid and bases
2.2 Lux-flood and solvent system concept of acid and bases
$W_{00} = 3 + 13/01/2020 + 18/01/2020$
• 3 Brief revision of previous week topics
 3 L ewis concept of acids and bases
 3.2 Relative strength of acids and bases
• 5.2 Relative strength of across and bases
Week 4, 20/01/2020 – 25/01/2020
• 4 Brief revision of previous week topics
• 4.1 Levelling effect of solvents
• 4.2 Hard and soft acid and bases
Week 5 $27/01/2020 = 01/02/2020$
• 5 Brief revision of previous week topics
 5 1 HSAB principle
• 5.2 Applications of HSAB principle
Chapter II Organometallic Chemistry
Week 6, 03/02/2020 – 08/02/2020
• 1 Introduction
• 1.1 Definition, classification and nomenclature of organometallic compounds
Week 7, 10/02/2020 - 15/02/2020
• 2 Brief revision of previous week topics • 2.1 Prepareties and granewice of all whe of Li. Al. He and Sp
 2.1 Freparation and properties of alkyls of Li, Al, Hg and Sn. 2.2 Ponding of alkyls of Li, Al, Hg and Sn.
• 2.2 Doliding of alkyls of Li, Ai, fig and Sh
Week 8, 17/02/2020 – 22/02/2020
• 3 Brief revision of previous week topics
• 3.1 concept of hapticity of organic ligand

3.2 Structure and bonding in metal-ethylenic complexes
 Week 9, 24/02/2020 – 29/02/2020 4 Brief revision of previous week topics 4.1 Structure of Ferrocene 4.2 Classification in metal carbonyls Minor test
 Week 10, 02/03/2020 - 07/03/2020 5 Brief revision of previous week topics 5.1 Preparation and properties of mononuclear carbonyls 5.2 Bonding in metal carbonyls
Chapter III Bio inorganic chemistry Week 11, 09/03/2020 – 14/03/2020 • 1 Introduction • 1.1 Metal ions present in biological system Week 10-11 (08/03/2020 – 15/03/2020 : Holi Break)
 Week 12, 16/03/2020 – 21/03/2020 2 Brief revision of previous week topics 2.1 Classification of metal ions on the basis of action
 Week 13, 23/03/2020 – 28/03/2020 3 Brief revision of previous week topics 3.1 Essential, non essential, trace, toxic metal ions 3.2 Metalloporphyrins
 Week 14, 30/03/2020 – 04/04/2020 4 Brief revision of previous week topics 4.1 Structure of haemoglobin and myoglobin 4.2 Function of haemoglobin and myoglobin
 Week 15, 06/04/2020 – 11/04/2020 (online teaching due to COVID-19 situation) 5 Brief revision of previous week topics 5.1 Cooperative effect and Bohr effect 5.2 Biological role of Na+, K+, Ca+2, Mg+2, Fe+2 ions
Chapter IV Silicones and Phosphazenes
Week 16, 13/04/2020 – 18/04/2020 • 1 Introduction • 1.1 Nomenclature of silicones.

Week 17, 20/04/2020 - 25/04/2020

- 2 Brief revision of previous week topics
- 2.1 Classification of silicones
- 2.2 Prepration and uses of silicones

Week 18, 27/04/2020 - 02/05/2020

- 3 Brief revision of previous week topics
- 3.1 Elastomers
- 3.2 Polysiloxane copolymers

Week 19, 04/05/2020 - 09/05/2020

- 4 Brief revision of previous week topics
- 4.1 Poly phosphazenes
- 4.2 Bonding in triphosphazene

LESSON PLAN (FROM JANUARY 2020 TO APRIL 2020)

Name of the Assistant/Associate Professor : Dr. Kuldeep Mahiya

Class: B.Sc. II (4 th Semester)	Section:	В
Subject: Inorganic Chemistry-II (Theory)	Paper:	CCL-404
Chapter I Transition Elements (3d series)		
Week 1, 01/01/2020 – 04/01/2020		
• 1 Introduction		
• 1.1 General group trends		
1.2 Electronic configuration		
Week 2. 06/01/2020 – 11/01/2020		
• 2 Brief revision of previous week topics		
• 2.1 Variable valency and oxidation states		
• 2.2 Coordination number and geometry		
• 2.3 Octahedral and tetrahedral geometry		
Week 3 $13/01/2020 - 18/01/2020$		
• 3 Brief revision of previous week topics		
 3 1 colour in transition metal ion complexes 		
 3.2 Magnetic properties 		
3.3 Catalytic properties		
Week 4, $20/01/2020 - 25/01/2020$		
• 4 Brief revision of previous week topics	omnlovoo	
 4.1 Complex formation ability of transition metal for c 4.2 Factors responsible for complex formation 	ompiexes	
Week 5, 27/01/2020 - 01/02/2020		
• 5 Brief revision of previous week topics		
• 5.1 Latimer diagrams for Mn		
• 5.2 Latimer diagrams for Fe and Cu.		
Chapter II Lanthanoids and actinoids		
Week 6, 03/02/2020 – 08/02/2020		
• 1 Introduction		
1.1 Position in periodic table		
Week 7, 10/02/2020 - 15/02/2020		
• 2 Brief revision of previous week tonics		
 2.1 Electronic configurations 		
• 2.2 oxidation states		
Week 8, 17/02/2020 – 22/02/2020		
• 3 Brief revision of previous week topics		

- 3.1 Stability of different oxidation states
- 3.2 colour in lanthanides
- 3.3 Magnetic properties

Week 9, 24/02/2020 - 29/02/2020

- 4 Brief revision of previous week topics
- 4.1 lanthanide contraction
- 4.2 Separation of lanthanides
- Minor test

Week 10, 02/03/2020 - 07/03/2020

- 5 Brief revision of previous week topics
- 5.1 Actinoids
- 5.2 Oxidation states, colour, magnetic properties

Chapter III Coordination Chemistry

Week 11, 09/03/2020 – 14/03/2020

- 1 Introduction
- 1.1 Valence Bond Theory (VBT)

Week 10-11 (08/03/2020 – 15/03/2020 : Holi Break)

Week 12, 16/03/2020 – 21/03/2020

- 2 Brief revision of previous week topics
- 2.1 Inner and outer orbital complexes of Cr and Fe (coordination numbers 4 and 6)
- 2.2 Inner and outer orbital complexes of Co, Ni and Cu (coordination numbers 4 and 6)

Week 13, 23/03/2020 - 28/03/2020

- 3 Brief revision of previous week topics
- 3.1 Isomerism in coordination compounds
- 3.2 Structural isomerism in complexes with coordination numbers 4

Week 14, 30/03/2020 - 04/04/2020

- 4 Brief revision of previous week topics
- 4.1 Structural isomerism in complexes with coordination numbers 6
- 4.2 Stereoisomerism in complexes with coordination numbers 4

Week 15, 06/04/2020 – 11/04/2020 (online teaching due to COVID-19 situation)

- 5 Brief revision of previous week topics
- 5.1 Stereoisomerism in complexes with coordination numbers 6
- 5.2 IUPAC system of nomenclature
- 5.3 Drawbacks of VBT

Chapter IV Crystal Field Theory

Week 16, 13/04/2020 - 18/04/2020

- 1 Introduction
- 1.1 Crystal field effect: Tetrahedral and octahedral symmetry
- 1.2 Crystal field effects for weak and strong fields

Week 17, 20/04/2020 - 25/04/2020

- 2 Brief revision of previous week topics
- 2.1 Factors affecting the magnitude of d-orbital splittings
- 2.2 Spectrochemical series

Week 18, 27/04/2020 - 02/05/2020

- 3 Brief revision of previous week topics
- 3.1 Comparison of CFSE for Oh and Td complexes
- 3.2 Tetragonal distortion of octahedral geometry

Week 19, 04/05/2020 – 09/05/2020

- 4 Brief revision of previous week topics
- 4.1 Jahn-Teller distortion
- 4.2 Square planar coordination

LESSON PLAN (FROM JANUARY 2020 TO APRIL 2020)

Name of the Assistant/Associate Professor : Dr. Kuldeep Mahiya

Class: B.Sc. III (6 th Semester)	Group:	A and B
Subject: Chemistry Practicals	Paper:	CH-307

Week 1, 01/01/2020 – 04/01/2020
• Introduction
• Do's and don't in laboratory
• Handling of chemical and glassware
Maintaining of lab note book and lab record
Section A : Inorganic Chemistry
Semi micro qualitative analysis of mixture containing not more than four radicals
(excluding interfering, Combinations and insoluble)
Week 2, 06/01/2020 – 11/01/2020
• Introduction to acidic and basic radicals (cations and anions)
Viva-voce
Week 3, 13/01/2020 – 18/01/2020
• Identification of group one radicals (Experiment 1)
• Identification of group two radicals (Experiment 2)
Viva-voce
Week 4, 20/01/2020 – 25/01/2020
• Identification of group three radicals (Experiment 3)
Viva-voce
Week 5, 27/01/2020 - 01/02/2020
• Identification of group four radicals (Experiment 4)
Viva-voce
Week 6, 03/02/2020 – 08/02/2020
• Identification of group five radicals (Experiment 5)
• Identification of group six radicals (Experiment 6)
• Viva-voce
Section B : Physical Chemistry
Week 7, 10/02/2020 - 15/02/2020
• To determine the strength of the given acid solution (mono acid only) (Experiment 7)
• To determine the solubility and solubility product of a sparingly soluble (Experiment 8)
• Viva-voce
Week 8, 17/02/2020 – 22/02/2020

- To determine the molecular weight of non-volatile solute by Rast method (Experiment 9).
- Prepration of acidic and basic buffers and comparison of their pH with theoretical values (Experiment 10).
- Viva-voce

Section C : Organic Chemistry

Week 9, 24/02/2020 - 29/02/2020

- Determination of R_f values and identification of organic Compounds (Experiment 11)
- Viva-voce

Week 10, 02/03/2020 - 07/03/2020

- To prepare p-bromoaniline from p-bromoacetanilide (Experiment 12)
- To prepare m-nitroaniline from m-dinitrobenzene (Experiment 13)
- Viva-voce

Week 11, 09/03/2020 – 14/03/2020

- To prepare S-Benzyl-iso-thiouronium chloride from Thiourea (Experiment 14)
- Viva-voce

Week 12, 16/03/2020 - 21/03/2020

- Separation of a mixture of coloured organic compounds using common organic solvents (Experiment 15).
- Viva-voce

Week 13, 23/03/2020 - 28/03/2020

- Discussion on previous week experiment
- Viva-voce

Week 14, 30/03/2020 - 04/04/2020

- Discussion on previous week experiment
- Lab record

Session 2019-20 (Even semester)

LESSON PLAN (FROM JANUARY 2020 TO APRIL/MAY 2020)

Name of the Assistant/Associate Professor: Mr. Jitender Kumar

Class: B.Sc. III (6 th Semester)	Section:	B
Subject: Physical Chemistry (Theory)	Paper:	CH-305

Chapter I Introduction to statistical mechanics Week 1, 01/01/2020 - 04/01/2020 Introduction Need for statistical thermodynamics, thermodynamic probability Week 2, 06/01/2020 – 11/01/2020 Maxwell Boltzmann distribution statistics Week 3, 13/01/2020 - 18/01/2020 Brief revision of previous week topics Born oppenheimer approximation, partition function and its physical significance. Factorization of partition function **Chapter II Photochemistry** Week 4, 20/01/2020 – 25/01/2020 Brief revision of previous week topics Interaction of radiation with matter, difference between thermal and photochemical processes. Week 5, 27/01/2020 - 01/02/2020 Laws of photochemistry: Grotthus-Drapper law, Stark-Einstein law (law of photochemical equivalence), Week 6, 03/02/2020 – 08/02/2020 Jablonski diagram depicting various processes occurring in the excited state, Week 7, 10/02/2020 - 15/02/2020

Qualitative description of fluorescence, phosphorescence, non-radiative processes

(internal conversion, intersystem crossing),

Week 8, 17/02/2020 – 22/02/2020

Brief revision of previous week topics and quantum yield, photosensitized reactionsenergy transfer processes (simple examples).

Chapter III Solutions, Dilute Solutions and Colligative Properties

Week 9, 24/02/2020 – 29/02/2020

Ideal and non-ideal solutions, methods of expressing concentrations of solutions, Dilute solutions, Raoult's law. Minor test

Week 10, 02/03/2020 - 07/03/2020

Colligative properties: (i) relative lowering of vapour pressure (ii) Elevation in boiling point (iii) depression in freezing point (iv) osmotic pressure.

Week 11, 09/03/2020 - 14/03/2020

Thermodynamic derivation of relation between amount of solute and elevation in boiling point and depression in freezing point.

Week 10-11 (08/03/2020 – 15/03/2020 : Holi Break)

Week 12, 16/03/2020 - 21/03/2020

Applications in calculating molar masses of normal, dissociated and associated solutes in solution.

Chapter IV Phase Equillibrium

Week 13, 23/03/2020 - 28/03/2020

Statement and meaning of the terms - phase, component, and degree of freedom,

Week 14, 30/03/2020 - 04/04/2020

Thermodynamic derivation of Gibbs phase rule, phase equilibria of one component system –Example – water system.

Week 16, 13/04/2020 - 18/04/2020

Phase equilibria of two component systems solid-liquid equilibria, simple eutectic

Week 17, 20/04/2020 – 25/04/2020

Brief revision of previous week topics Example Pb-Ag system, desilverisation of lead.

Week 18, 27/04/2020 - 02/05/2020

- 3 Brief revision of previous week topics
- Revision of Chapter I and Chapter II

Week 19, 04/05/2020 – 09/05/2020 Revision of Chapter III and IV

LESSON PLAN (FROM JANUARY 2020 TO APRIL 2020)

Name of the Assistant/Associate Professor: Mr. Jitender Kumar

Class: B.Sc. II (4 th Semester)	Section:	B
Subject: Physical Chemistry-III (Theory)	Paper:	CCL-405

Chapter I Kinetic Theory of Gases

Week 1, 01/01/2020 - 04/01/2020

Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation. Deviation of real gases from ideal behavior, compressibility factor, causes of deviation. van der Waals equation of state for real gases.

Week 2, 06/01/2020 – 11/01/2020

Brief revision of previous week topics Boyle temperature (derivation not required). Critical phenomena, critical constants, and their calculation from van der Waals equation. Andrew's isotherms of CO2.

Week 3, 13/01/2020 - 18/01/2020

Brief revision of previous week topics Maxwell Boltzmann distribution laws of molecular velocities and molecular energies (graphic representation – derivation not required) and their importance

Week 4, 20/01/2020 - 25/01/2020

Brief revision of previous week topics Temperature dependence of these distributions. Most probable, average and root mean square velocities (no derivation).

Week 5, 27/01/2020 - 01/02/2020

Brief revision of previous week topics Collision cross section, collision number, collision frequency, collision diameter and mean free path of molecules

Chapter II Liquids

Week 6, 03/02/2020 – 08/02/2020

Introduction

Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer.

Week 7, 10/02/2020 - 15/02/2020

Brief revision of previous week topics Effect of temperature on surface tension and coefficient of viscosity of a liquid (Qualitative treatment only).

Chapter III Solids

Week 8, 17/02/2020 - 22/02/2020

Brief revision of previous week topics **Solids:** Forms of solids. Symmetry elements, unit cells, crystal systems, Bravais lattice types and identification of lattice planes.

Week 9, 24/02/2020 - 29/02/2020

Brief revision of previous week topics Laws of Crystallography - Law of constancy of interfacial angles, Law of rational indices. law. Minor test

Week 10, 02/03/2020 - 07/03/2020

Brief revision of previous week topics Miller indices. X–Ray diffraction by crystals, Bragg's Structures of NaCl, KCl and CsCl (qualitative treatment only). Defects in crystals.

Chapter IV Chemical Kinetics

Week 11, 09/03/2020 - 14/03/2020

Introduction The concept of reaction rates. Week 10-11 (08/03/2020 – 15/03/2020: Holi Break)

Week 12, 16/03/2020 – 21/03/2020

Brief revision of previous week topics The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates.

Week 13, 23/03/2020 – 28/03/2020

Brief revision of previous week topics Order and molecularity of a reaction. Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants).

Week 14, 30/03/2020 – 04/04/2020

Half–life of a reaction. General methods for determination of order of reaction. Concept of activation energy and its calculation from Arrhenius equation.

Week 15, 06/04/2020 – 11/04/2020 (online teaching due to COVID-19 situation)

Brief revision of previous week topics

Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only).

Chapter IV Chemical Kinetics Revision

Week 16, 13/04/2020 – 18/04/2020

Introduction

The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates.

Week 17, 20/04/2020 – 25/04/2020

Order and molecularity of a reaction. Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants).

Week 18, 27/04/2020 - 02/05/2020

Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only).

Week 19, 04/05/2020 – 09/05/2020

Revision

LESSON PLAN (FROM JANUARY 2020 TO APRIL 2020)

Name of the Assistant/Associate Professor: Mr. Jitender Kumar

Class: B.Sc. III (6 th Semester)	Group: B, C,	And D
Subject: Chemistry Practical's	Paper:	CH-307

Week 1, 01/01/2020 – 04/01/2020
Introduction
• Do's and don't in laboratory
Handling of chemical and glassware
• Maintaining of lab note book and lab record
Section A : Inorganic Chemistry
Semi micro qualitative analysis of mixture containing not more than four radicals (excluding interfering, Combinations and insoluble)
Week 2, 06/01/2020 – 11/01/2020
• Introduction to acidic and basic radicals (cations and anions)
Viva-voce
Week 3, 13/01/2020 – 18/01/2020
• Identification of group one radicals (Experiment 1)
• Identification of group two radicals (Experiment 2)
Viva-voce
Week 4. 20/01/2020 – 25/01/2020
• Identification of group three radicals (Experiment 3)
• Viva-voce
Week 5, 27/01/2020 - 01/02/2020
• Identification of group four radicals (Experiment 4)
Viva-voce
Week 6, 03/02/2020 – 08/02/2020
• Identification of group five radicals (Experiment 5)
 Identification of group six radicals (Experiment 6)
 Viva-voce
Section B: Physical Chemistry
Section Der nysical Onemistry
Week 7, 10/02/2020 - 15/02/2020
• To determine the strength of the given acid solution (mono acid only) (Experiment 7)
• To determine the solubility and solubility product of a sparingly soluble (Experiment
8)
Viva-voce

 Week 8, 17/02/2020 – 22/02/2020 To determine the molecular weight of non-volatile solute by Rast method (Experiment)
9).
• Prepration of acidic and basic buffers and comparison of their pH with theoretical values (Experiment 10).
Viva-voce
Section C: Organic Chemistry
Week 9, 24/02/2020 – 29/02/2020
 Determination of Rf values and identification of organic Compounds (Experiment 11) Viva-voce
Week 10, 02/03/2020 – 07/03/2020
• To prepare p-bromoaniline from p-bromoacetanilide (Experiment 12)
• To prepare m-nitroaniline from m-dinitrobenzene (Experiment 13)
• Viva-voce
Week 11 09/03/2020 – 14/03/2020
• To prepare S-Benzyl-iso-thiouronium chloride from Thiourea (Experiment 14)
 Viva-voce
Week 12, 16/03/2020 – 21/03/2020
• Separation of a mixture of coloured organic compounds using common organic solvents (Experiment 15).
Viva-voce
Week 13, 23/03/2020 – 28/03/2020
Discussion on previous week experiment
Viva-voce
Week 14, 30/03/2020 – 04/04/2020
• Discussion on previous week experiment
• Lab record

Session 2019-20 (Even semester)

LESSON PLAN (FROM JANUARY 2020 TO APRIL/MAY 2020)

Name of the Assistant/Associate Professor: Mr. Shyam Lal

Class: B.Sc. III (6 th Semester)	Section:	В
Subject: Organic Chemistry (Theory)	Paper:	CH-306

Chapter I:Organic Synthesis via Enolates
 Week 1, 01/01/2020 – 04/01/2020 Acidity of α-hydrogens alkylation of diethyl malonate and ethyl acetoacetate
 Week 2, 06/01/2020 – 11/01/2020 Synthesis of ethyl acetoacetate the Claisen condensation
 Week 3, 13/01/2020 – 18/01/2020 Brief revision of previous week topics Keto-enol tautomerism of ethyl acetoacetate
Chapter II: Heterocyclic Compounds
 Week 4, 20/01/2020 – 25/01/2020 Introduction Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine.
 Week 5, 27/01/2020 - 01/02/2020 Methods of synthesis chemical reactions with particular emphasis on the mechanism of electrophilic substitution
 Week 6, 03/02/2020 – 08/02/2020 Mechanism of nucleophilic substitution reactions in pyridine derivatives Comparison of basicity of pyridine, piperidine and pyrrole
 Week 8, 17/02/2020 – 22/02/2020 Prepration and reactions of quinoline Prepration and reactions of isoquinoline
 Week 9, 24/02/2020 – 29/02/2020 Mechanism of electrophilic substitution reactions of, quinoline and isoquinoline Minor test
Chapter III: Amino Acids, Peptides& Proteins

Week 10, 02/03/2020 - 07/03/2020

- Classification, of amino acids. Acid-base behavior
- Isoelectric point and electrophoresis

Week 11, 09/03/2020 – 14/03/2020 Week 10-11 (08/03/2020 – 15/03/2020 : Holi Break)

Week 12, 16/03/2020 - 21/03/2020

- Brief revision of previous week topics
- Preparation of α-amino acids
- Structure and nomenclature of peptides and proteins

Week 13, 23/03/2020 - 28/03/2020

- Brief revision of previous week topics
- Classification of proteins
- Peptide structure determination, end group analysis, selective hydrolysis of peptides.

Week 14, 30/03/2020 – 04/04/2020

- Brief revision of previous week topics
- Classical peptide synthesis, solid- phase peptide synthesis
- Structures of peptides and proteins: Primary & Secondary structure

Chapter IV: Synthetic Polymers

Week 15, 06/04/2020 – 11/04/2020 (online teaching due to COVID-19 situation)

- Brief revision of previous week topics
- Addition or chain-growth polymerization

Week 16, 13/04/2020 – 18/04/2020

- Free radical vinyl polymerization
- Ionic vinyl polymerization

Week 17, 20/04/2020 – 25/04/2020

- Ziegler-Natta polymerization and vinyl polymers
- Condensation or step growth polymerization
- Brief revision of previous week topics,...

Week 18, 27/04/2020 - 02/05/2020

- Brief revision of previous week topics
- Polyesters, polyamides, phenol formaldehyde resins.
- Natural and synthetic rubbers

Week 19, 04/05/2020 – 09/05/2020

• Brief revision of previous week topics

LESSON PLAN (FROM JANUARY 2020 TO APRIL 2020)

Name of the Assistant/Associate Professor : Mr. Shyam Lal

Class: B.Sc. II (4 th Semester)	Section:	B
Subject: Inorganic Chemistry-II (Theory)	Paper:	CCL-404
Chapter I Transition Elements (3d series)		
Week 1, 01/01/2020 – 04/01/2020		
• 1 Introduction		
• 1.1 General group trends		
1.2 Electronic configuration		
Week 2, 06/01/2020 – 11/01/2020		
• 2 Brief revision of previous week topics		
• 2.1 Variable valency and oxidation states		
• 2.2 Coordination number and geometry		
• 2.3 Octahedral and tetrahedral geometry		
Week 3. 13/01/2020 – 18/01/2020		
• 3 Brief revision of previous week topics		
• 3.1 colour in transition metal ion complexes		
• 3.2 Magnetic properties		
3.3 Catalytic properties		
W		
• 4 Priof register of provide weak topics		
 4 Bher revision of previous week topics 4.1 Complex formation ability of transition metal 	ion complexed	
 4.1 Complex formation ability of transition metal 4.2 Easters responsible for complex formation 	ion complexes	
• 4.2 Factors responsible for complex formation		
Week 5, 27/01/2020 - 01/02/2020		
• 5 Brief revision of previous week topics		
• 5.1 Latimer diagrams for Mn		
• 5.2 Latimer diagrams for Fe and Cu.		
Chapter II Lanthanoids and actinoids		
Week 6, 03/02/2020 – 08/02/2020		
• 1 Introduction		
• 1.1 Position in periodic table		_
Week 7, 10/02/2020 - 15/02/2020		
• 2 Brief revision of previous week topics		
• 2.1 Electronic configurations		

- 3.1 Stability of different oxidation states
- 3.2 colour in lanthanides
- 3.3 Magnetic properties

Week 9, 24/02/2020 - 29/02/2020

- 4 Brief revision of previous week topics
- 4.1 lanthanide contraction
- 4.2 Separation of lanthanides
- Minor test

Week 10, 02/03/2020 - 07/03/2020

- 5 Brief revision of previous week topics
- 5.1 Actinoids
- 5.2 Oxidation states, colour, magnetic properties

Chapter III Coordination Chemistry

Week 11, 09/03/2020 – 14/03/2020

- 1 Introduction
- 1.1 Valence Bond Theory (VBT)

Week 10-11 (08/03/2020 – 15/03/2020 : Holi Break)

Week 12, 16/03/2020 – 21/03/2020

- 2 Brief revision of previous week topics
- 2.1 Inner and outer orbital complexes of Cr and Fe (coordination numbers 4 and 6)
- 2.2 Inner and outer orbital complexes of Co, Ni and Cu (coordination numbers 4 and 6)

Week 13, 23/03/2020 - 28/03/2020

- 3 Brief revision of previous week topics
- 3.1 Isomerism in coordination compounds
- 3.2 Structural isomerism in complexes with coordination numbers 4

Week 14, 30/03/2020 - 04/04/2020

- 4 Brief revision of previous week topics
- 4.1 Structural isomerism in complexes with coordination numbers 6
- 4.2 Stereoisomerism in complexes with coordination numbers 4

Week 15, 06/04/2020 – 11/04/2020 (online teaching due to COVID-19 situation)

- 5 Brief revision of previous week topics
- 5.1 Stereoisomerism in complexes with coordination numbers 6
- 5.2 IUPAC system of nomenclature
- 5.3 Drawbacks of VBT

Chapter IV Crystal Field Theory

Week 16, 13/04/2020 - 18/04/2020

- 1 Introduction
- 1.1 Crystal field effect: Tetrahedral and octahedral symmetry
- 1.2 Crystal field effects for weak and strong fields

Week 17, 20/04/2020 - 25/04/2020

- 2 Brief revision of previous week topics
- 2.1 Factors affecting the magnitude of d-orbital splittings
- 2.2 Spectrochemical series

Week 18, 27/04/2020 - 02/05/2020

- 3 Brief revision of previous week topics
- 3.1 Comparison of CFSE for Oh and Td complexes
- 3.2 Tetragonal distortion of octahedral geometry

Week 19, 04/05/2020 – 09/05/2020

- 4 Brief revision of previous week topics
- 4.1 Jahn-Teller distortion
- 4.2 Square planar coordination

LESSON PLAN (FROM JANUARY 2020 TO APRIL 2020)

Name of the Assistant/Associate Professor : Mr. Shyam Lal

Class: B.Sc. II (4 th Semester)	Group:	A and E
Subject: Chemistry Practicals	Paper:	CCP-409

Week 1, 01/01/2020 – 04/01/2020
• Introduction
• Do's and don't in laboratory
• Handling of chemical and glassware
• Maintaining of lab note book and lab record
Section A : Inorganic Chemistry
Semi micro qualitative analysis of mixture containing not more than four radica
(excluding interfering, Combinations and insoluble)
Week 2, 06/01/2020 – 11/01/2020
• Introduction to acidic and basic radicals (cations and anions)
Viva-voce
Week 3, 13/01/2020 – 18/01/2020
• Identification of group one radicals (Experiment 1)
• Identification of group two radicals (Experiment 2)
Viva-voce
Week 4, 20/01/2020 – 25/01/2020
• Identification of group three radicals (Experiment 3)
Viva-voce
Week 5, 27/01/2020 - 01/02/2020
• Identification of group four radicals (Experiment 4)
Viva-voce
Week 6, 03/02/2020 – 08/02/2020
• Identification of group five radicals (Experiment 5)
• Identification of group six radicals (Experiment 6)
Viva-voce
Week 7, 10/02/2020 - 15/02/2020
• Estimate the amount of nickel present in a given solution as
bis(dimethylglyoximato)nickel (II) in a given solution gravimetrically. (Experiment 7)
• Estimation of (i) Mg2+ or (ii) Zn2+ by complexometric titrations using EDTA $(\text{Transitionant } 0)$
(Experiment 8)

Week 8, 17/02/2020 – 22/02/2020
• Estimation of total hardness of a given sample of water by complexometric titration
(Experiment 9).
• Determination of the surface tension of a liquid or a dilute solution using a stalagmometer
(Experiment 10)
Viva-voce
Section B : Physical Chemistry
Week 9 24/02/2020 - 29/02/2020
• Introduction
 Study of the variation of surface tension of a detergent solution with concentration
(Experiment 11)
• Determination of the viscosity of a liquid or dilute solution using an Ostwald's
viscometer (Experiment 12)
Viva-voce
Week 10, $02/03/2020 - 07/03/2020$
• Study of the variation of viscosity of an aqueous solution with concentration of solute(Experiment 13)
Viva voca
Week 11, 09/03/2020 – 14/03/2020
Chemical Kinetics Study the kinetics of the following reactions by integrated rate
method
• Acid hydrolysis of methyl acetate with hydrochloric acid. (Experiment 14)
Viva-voce
$W_{abl} = 12 - 16/02/2020 = 21/02/2020$
week 12, $10/05/2020 - 21/05/2020$
 Saponification of ethyl acetale (Experiment 15). Compare the strengths of HCl and H2SO4 by studying kinetics of bydrolysis of mothyl
• Compare the strengths of HCI and H2SO4 by studying kinetics of hydrorysis of methyl acetate(Experiment 16)
• Viva-voce
Week 13, 23/03/2020 – 28/03/2020
• Discussion on previous week experiment.
Viva-voce
Week 14, 30/03/2020 – 04/04/2020
Discussion on previous week experiment

Lab record

Session 2019-20 (Even semester)

LESSON PLAN (FROM JANUARY 2020 TO APRIL/MAY 2020)

Name of the Assistant/Associate Professor: Dr. Prince Kumar

Class: B.Sc. III (6th Semester) Subject: Physical Chemistry (Theory)

Paper: XIX (CH-305)

SECTION-A

Week 1, 01/01/2020 – 04/01/2020

• Need for statistical thermodynamics, thermodynamic probability, Maxwell Boltzmann distribution statistics

Week 2, 06/01/2020 – 11/01/2020

• Born oppenheimer approximation, partition function and its physical significance

Week 3, 13/01/2020 – 18/01/2020

• Factorization of partition function

Week 4, 20/01/2020 - 25/01/2020

• Interaction of radiation with matter, difference between thermal and photochemical processes

Week 5, 27/01/2020 - 01/02/2020

Laws of photochemistry: Grotthus-Drapper law, Stark- Einstein law (law of photochemical equivalence)

Week 6, 03/02/2020 - 08/02/2020

• Jablonski diagram depiciting various processes occurring in the excited state

Week 7, 10/02/2020 - 15/02/2020

• qualitative description of fluorescence, phosphorescence

Week 8, 17/02/2020 - 22/02/2020

• Brief revision of previous week topics

Week 9, 24/02/2020 – 29/02/2020

Non-radiative processes (internal conversion, intersystem crossing), quantum yield. photosensitized reactions-energy transfer processes (simple examples)

• Minor test

Week 10, 02/03/2020 - 07/03/2020

• Brief revision of previous week topics

SECTION-B

Week 11, 09/03/2020 – 14/03/2020

Ideal and non-ideal solutions, methods of expressing concentrations of solutions, Dilute solutions, Raoult's law

Week 10-11 (08/03/2020 – 15/03/2020 : Holi Break)

Week 12, 16/03/2020 - 21/03/2020

- Brief revision of previous week topics
- specific conductance, molar conductance, equivalent conductance
- and relation among them

Week 13, 23/03/2020 - 28/03/2020

- Brief revision of previous week topics
- Colligative properties: (i) relative lowering of vapour pressure (ii) Elevation in boiling point (iii) depression in freezing point(iv) osmotic pressure

Week 14, 30/03/2020 - 04/04/2020

- Brief revision of previous week topics
- Thermodynamic derivation of relation between amount of solute and elevation in boiling point and depression in freezing point

Week 15, 06/04/2020 – 11/04/2020 (online teaching due to COVID-19 situation)

- Brief revision of previous week topics
- Applications in calculating molar masses of normal, dissociated and associated solutes in solution

Week 16, 13/04/2020 – 18/04/2020

• Statement and meaning of the terms – phase, component and degree of freedom, thermodynamic derivation of Gibbs phase rule

Week 17, 20/04/2020 – 25/04/2020

- Brief revision of previous week topics
- phase equilibria of one component system –Example water system

Week 18, 27/04/2020 – 02/05/2020

- Brief revision of previous week topics
- Phase equilibria of two component systems solid-liquid equilibria, simple eutectic Example Pb-Ag system

Week 19, 04/05/2020 – 09/05/2020

• Brief revision of previous week topics desilverisation of lead.

LESSON PLAN (FROM JANUARY 2020 TO APRIL 2020)

Name of the Assistant/Associate Professor: Dr. Prince Kumar

Class: B.Sc. II (4th Semester) **Subject: Physical Chemistry-II (Theory)**

Section: B Paper:

CCL-405

Chapter I Transition Elements (3d series)

Week 1, 01/01/2020 – 04/01/2020

• Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation.

Week 2, 06/01/2020 – 11/01/2020

• Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation.

Week 3, 13/01/2020 – 18/01/2020

• Waals equation of state for real gases. Boyle temperature (derivation not required). Critical phenomena, critical constants and their calculation from van der Waals equation. And rews isotherms of CO2.

Week 4, 20/01/2020 – 25/01/2020

- Maxwell Boltzmann distribution laws of molecular velocities and molecular energies (graphic representation – derivation not required) and their importance.
- Temperature dependence of these distributions. Most probable, average and root mean square velocities (no derivation)

Week 5, 27/01/2020 - 01/02/2020

• Collision cross section, collision number, collision frequency, collision diameter and mean free path of molecules.

UNIT-2

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Week 6, 03/02/2020 – 08/02/2020

• Surface tension and its determination using stalagmometer.

Week 7, 10/02/2020 - 15/02/2020

• Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer

Week 8, 17/02/2020 – 22/02/2020

• 3 Brief revision of previous week topics

Week 9, 24/02/2020 – 29/02/2020

- Effect of temperature on surface tension
- Minor test

Week 10, 02/03/2020 - 07/03/2020

• Effect of temperature on surface tension and coefficient of viscosity of a liquid

(qualitative treatment only).

UNIT-3

Week 11, 09/03/2020 – 14/03/2020

• Forms of solids. Symmetry elements,

Week 10-11 (08/03/2020 – 15/03/2020 : Holi Break)

Week 12, 16/03/2020 – 21/03/2020

• unit cells, crystal systems, Bravais lattice types and identification of lattice planes.

Week 13, 23/03/2020 - 28/03/2020

• Laws of Crystallography - Law of constancy of interfacial angles, Law of rational indices

Week 14, 30/03/2020 - 04/04/2020

• Miller indices.X–Ray diffraction by crystals,

Week 15, 06/04/2020 – 11/04/2020 (online teaching due to COVID-19 situation)

• Bragg's law.Structures of NaCl, KCl and CsCl (qualitative treatment only).Defects in crystals.

UNIT-4

Week 16, 13/04/2020 – 18/04/2020

• The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates.

Week 17, 20/04/2020 – 25/04/2020

- Order and molecularity of a reaction.Derivation of integrated rate
- equations for zero order

Week 18, 27/04/2020 – 02/05/2020

- Order and molecularity of a reaction.Derivation of integrated rate
- equations for first and second order reactions (both for equal and unequal concentrations of reactants).

Week 19, 04/05/2020 – 09/05/2020

- Brief revision of previous week topics
- Half–life of a reaction.General methods for determination of order of a reaction.Concept of activation energy and its calculation from Arrhenius equation.
- Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only).

LESSON PLAN (FROM JANUARY 2020 TO APRIL 2020)

Name of the Assistant/Associate Professor: Dr. Prince Kumar

Class: B.Sc. III (6 th Semester)	Group:	F and E
Subject: Chemistry Practicals	Paper:	CH-307

Week 1, 01/01/2020 - 04/01/2020 • Introduction • Do's and don't in laboratory • Handling of chemical and glassware Maintaining of lab note book and lab record • Section A : Inorganic Chemistry Semi micro qualitative analysis of mixture containing not more than four radicals (excluding interfering, Combinations and insoluble) Week 2, 06/01/2020 - 11/01/2020 • Introduction to acidic and basic radicals (cations and anions) Viva-voce Week 3, 13/01/2020 - 18/01/2020 • Identification of group one radicals (Experiment 1) Identification of group two radicals (Experiment 2) • Viva-voce Week 4, 20/01/2020 – 25/01/2020 • Identification of group three radicals (Experiment 3) • Viva-voce Week 5, 27/01/2020 - 01/02/2020 • Identification of group four radicals (Experiment 4) • Viva-voce Week 6, 03/02/2020 - 08/02/2020 • Identification of group five radicals (Experiment 5) • Identification of group six radicals (Experiment 6) • Viva-voce **Section B : Physical Chemistry** Week 7, 10/02/2020 - 15/02/2020 • To determine the strength of the given acid solution (mono acid only) (Experiment 7) • To determine the solubility and solubility product of a sparingly soluble (Experiment 8) Viva-voce •

Week 8, 17/02/2020 – 22/02/2020

- To determine the molecular weight of non-volatile solute by Rast method (Experiment 9).
- Prepration of acidic and basic buffers and comparison of their pH with theoretical values (Experiment 10).
- Viva-voce

Section C : Organic Chemistry

Week 9, 24/02/2020 - 29/02/2020

- Determination of R_f values and identification of organic Compounds (Experiment 11)
- Viva-voce

Week 10, 02/03/2020 - 07/03/2020

- To prepare p-bromoaniline from p-bromoacetanilide (Experiment 12)
- To prepare m-nitroaniline from m-dinitrobenzene (Experiment 13)
- Viva-voce

Week 11, 09/03/2020 – 14/03/2020

- To prepare S-Benzyl-iso-thiouronium chloride from Thiourea (Experiment 14)
- Viva-voce

Week 12, 16/03/2020 - 21/03/2020

- Separation of a mixture of coloured organic compounds using common organic solvents (Experiment 15).
- Viva-voce

Week 13, 23/03/2020 - 28/03/2020

- Discussion on previous week experiment
- Viva-voce

Week 14, 30/03/2020 - 04/04/2020

- Discussion on previous week experiment
- Lab record