Lesson Plan

Name of Assistant Professor: Mr. SANDEEP KUMAR
Class: B.Sc 3rd Semester:6th Subject: ORGANOMETALLICS AND BIOINORGANIC CHEMISTRY& POLYNUCLEAR HYDROCARBONS AND UV, IR SPECTROSCOPY
Lesson Plan: From January 16, 2023 to May 12, 2023.

Week 1 16.01.2023- 22.01.2023	Chemistry of 3d metals Oxidation states displayed by Cr, Fe, Co, Ni and Co
Week 2 23.01.2023- 29.01.2023	. A study of the following compounds (including preparation and important properties); Peroxo compounds of Cr, K2Cr2O7,
Week 30.01.2023 -05.02.2023	KMnO4, K4[Fe(CN)6], sodium nitroprusside, [Co(NH3)6]Cl3, Na3[Co(NO2)6].
Week 4 06.02.2023- 12.02.2023	Definition and Classification with appropriate examples based on nature of metalcarbon bond (ionic, s, p and multicentre bonds).
Week 5 13.02.2023-19.02.2023	Structures of methyl lithium, Zeiss salt and ferrocene. EAN rule as applied to carbonyls.
Week 6 20.02.2023- 26.02.2023	Preparation, structure, bonding and properties of mononuclear and polynuclear carbonyls of 3d metals.p-acceptor behaviour of carbon monoxide.
Week 7 27.02.2023- 05.03.2023	Synergic effects (VB approach)-(MO diagram of CO can be referred to for synergic effect to IR frequencies). TEST& ASSIGNMENT
Week 8 06.03.2023- 12.03.2023	Holi Vacations
Week 9 13.03.2023- 19.03.2023	A brief introduction to bio-inorganic chemistry. Role of metal ions present in biological systems with special reference to Na+ , K+ and Mg2+ ions: Na/K pump;
Week 10 20.03.2023- 26.03.2023	Role of Mg2+ ions in energy production and chlorophyll. Role of Ca2+ in blood clotting, stabilization of protein structures and structural role (bones).
Week 11 27.03.2023-02.04.2023	Polynuclear and heteronuclear aromatic compounds: Properties of the following compounds with reference to electrophilic and nucleophilic substitution: Naphthalene, Anthracene, Furan, Pyrrole, Thiophene, and Pyridine. TEST& ASSIGNMENT
Week 12 03.04.2023-09.04.2023	Polynuclear and heteronuclear aromatic compounds: Properties of the following compounds with reference to electrophilic and nucleophilic substitution: Pyrrole, Thiophene, and Pyridine
Week 13 10.04.2023- 16.04.2023	Active methylene compounds: Preparation: Claisen

	ester condensation. Keto-enoltautomerism.
Week 14 17.04.2023-23.04.2023	Reactions: Synthetic uses of ethyl acetoacetate (preparation of non-hetero molecules having upto 6 carbon).
Week 15 24.03.2023-30.04.2023	Application of Spectroscopy to Simple Organic Molecules Application of visible, ultraviolet and infrared spectroscopy in organic molecules. Electromagnetic radiations, electronic transitions, λmax&εmax,.
Week 16 01.05.2023-08.05.2023	chromophore, auxochrome, bathochromic and hypsochromic shifts. Application of electronic spectroscopy and Woodward rules for calculating λmax of conjugated dienes and α,β-unsaturated compounds
Week 17 09.05.2023-12.05.2023	Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on >C=O stretching absorptions).

Lesson Plan

Name of Assistant Professor: Mr. SANDEEP KUMAR
Class: B.Sc 2ND YEAR Semester:4TH Subject: INORGANIC CHEMISTRY
Lesson Plan: From January 16, 2023 to May 12, 2023.

Week 1 16.01.2023- 22.01.2023	Transition Elements (3d series) General group trends with special reference to electronic configuration, variable valency, colour, magnetic and catalytic properties,
Week 2 23.01.2023- 29.01.2023	Transition Elements (3d series) General group trends with special reference to magnetic and catalytic properties,
Week 30.01.2023 -05.02.2023	ability to form complexes and stability of various oxidation states (Latimer diagrams) for Mn, Fe and Cu.
Week 4 06.02.2023- 12.02.2023	ability to form complexes and stability of various oxidation states (Latimer diagrams) for Cu. TEST& ASSIGNMENT
Week 5 13.02.2023-19.02.2023	Lanthanoids and actinoids Electronic configurations,
Week 6 20.02.2023- 26.02.2023	oxidation states, colour, magnetic properties, lanthanide contraction
Week 7 27.02.2023- 05.03.2023	separation of lanthanides (ion exchange method only)
Week 8 06.03.2023- 12.03.2023	Holi Vacations
Week 9 13.03.2023- 19.03.2023	Coordination Chemistry Valence Bond Theory (VBT): Inner and outer orbital complexes of Cr, Fe
Week 10 20.03.2023- 26.03.2023	AND Co, Ni and Cu (coordination numbers 4 and 6)..
Week 11 27.03.2023-02.04.2023	Structural and stereoisomerism in complexes with coordination numbers 4 and 6
Week 12 03.04.2023-09.04.2023	Drawbacks of VBT.IUPAC system of nomenclature
Week 13 10.04.2023- 16.04.2023	Crystal Field Theory Crystal field effect, octahedral symmetry.. TEST& ASSIGNMENT
Week 14 17.04.2023-23.04.2023	Crystal field stabilization energy (CFSE), Crystal field effects for weak and strong fields.
Week 15 24.03.2023-30.04.2023	Tetrahedral symmetry.Factors affecting the magnitude of dorbital splittings.Spectrochemical series.
Week 16 01.05.2023-08.05.2023	Comparison of CFSE for Oh and Td complexes, Tetragonal distortion of octahedral geometry.Jahn-

	Teller distortion, Square planar coordination
Week 17 09.05.2023-12.05.2023	REVISION & TEST