

UNIT - 01

PLANK'S QUANTUM THEORY - WAVE PARTICLE DUALITY - UNCERTAINTY PRINCIPLE - OPERATOR AND OBSERVABLES - POSTULATES OF QUANTUM MECHANICS - SCHRODINGER EQUATION - INTERPRETATION OF WAVE FUNCTION AND EXPECTATION (EIGEN) VALUES.

UNIT - 02

ORTHOGONALITY AND NORMALIZATION OF WAVE FUNCTION - PRINCIPLE OF SUPERPOSITION - APPLICATION OF SCHRODINGER WAVE EQUATION TO PARTICLE IN ONE DIMENSIONAL BOX - THREE DIMENSIONAL BOX.

UNIT - 03

SCHRODINGER EQUATION FOR HYDROGENATION - SEPARATION OF VARIABLES - PHI-EQUATION - THETA EQUATION AND RADIAL EQUATION - TOTAL WAVE FUNCTION.

UNIT - 04

QUANTUM NUMBERS AND THEIR SIGNIFICANCE - SHAPES OF ATOMIC ORBITALS - ELECTRON SPIN AND PAULI EXCLUSION PRINCIPLE - POLY ELECTRONIC ATOMS.

UNIT - 05

INTER ELECTRON REPULSION AND ITS CONSEQUENCES ENERGY LEVELS IN POLY ELECTRONIC ATOMS - R-S COUPLING - SPIN-ORBIT COUPLING - J-J COUPLING - MICROSTATES AND THEIR CLASSIFICATION - TERM SYMBOLS.

UNIT - 06

NATURE OF COVALENT BOND - VALENCE BOND METHOD - CONCEPT OF RESONANCE AND HYBRIDIZATION AND BOND ANGLES - APPLICATION TO SIMPLE MOLECULES - MOLECULAR ORBITAL THEORY - GEOMETRICS OF THE ORBITALS - SYMMETRY AND ANTI-SYMMETRY OF MOLECULAR ORBITALS - CONSTRUCTION OF MOLECULAR ORBITALS IN DIATOMIC MOLECULES.

UNIT - 07

MOLECULAR ORBITALS IN POLAR MOLECULES - IONIC BONDING - LATTICE ENERGY - BORN EQUATION AND ITS DERIVATION RADIUS RATIO RULES.

UNIT - 08

STRUCTURES OF SOME IONIC CRYSTALS - (SODIUM CHLORIDE - CESIUM CHLORIDE - RUTILE - WURTZITE - FLOURITE) - HYDROGEN BONDING.

UNIT - 09

CO-ORDINATION CHEMISTRY OF TRANSITION METAL IONS - INTRODUCTION - NOMENCLATURE - STABILITY CONSTRAINS OF COMPLEX AND THEIR DETERMINATION (PH METRIC AND SPECTROPHOTOMETRIC METHODS) - FACTORS INFLUENCING STABILITY.

UNIT - 10

STABILIZATION OF UNUSUAL OXIDATION STATES - STEREOISOMERISM OF COORDINATION COMPLEXES - ABSOLUTE CONFIGURATION OF COMPLEXES - STEREOSPECIFICITY OF THE CONFORMATION OF CHELATE RINGS.

UNIT - 11

BONDING IN COMPLEX - METAL - LIGAND BOND - V.B THEORY AND ITS LIMITATIONS - CRYSTAL FIELD THEORY - SPLITTING OF D-ORBITALS - CFSE EVIDENCE FOR CFSE - FACTOR AFFECTING SPLITTING - SPECTROCHEMICAL SERIES - SITE PREFERENCE - LIMITATION OF CFT - LIGAND THEORY - M.O THEORY SIGMA AND PI-BONDING IN COMPLEXES.

UNIT - 12

SPECTROSCOPIC AND MAGNETIC PROPERTIES OF COMPLEXES/TERM STATES FOR A D-ION IN OCTAHEDRAL COMPLEXES - CHARACTERISTICS OF D-D TRANSITIONS - ENERGY LEVEL DIAGRAMS OF ORGAL - SUGANO TAUNABLE - WEAK FIELD AND STRONG FIELD CONCEPTS - JAHN TELLER DISTORTION - NEPHELAUXETIC EFFECT - MAGNETISM - DIA - PARA MAGNETISM - SPIN ONLY MOMENTS OF DN-SYSTEMS.