2-vaishali nagar, Near Amrapali railway crossing, Raiya road, Rajkot-360001. Ph.No.-(0281)2440478, 2472590	**3-vaishali nagar, Near Amrapali railway crossing, Raiya road, Rajkot-360001. Ph.No.-(0281)2471645**	**Behind marketing yard, Near Lalpari lake, Between Amagadh-Bhichri, Rajkot-360002. Ph.No.-90990 63150**

M.Sc. SEMESTER-I

C-101: INORGANIC CHEMISTRY

1. Quantum Chemistry and its applications (MO-VB Theory)

Born-Oppenheimer approximation, Hydrogen molecule ion.LCAO-MO and VB treatments of hydrogen molecule, electron density, forces and their role in chemical bonding.Hybridization and valence MO's of H2O, NH3 and CH4. Huckel□-electron theory and its applications to ethylene, butadiene and benzene.Idea of self-consistent field method.

2. Magneto chemistry

Introduction, definition, types of magnetic bodies, Russell-Saunders and LS coupling. Derivation of Russell-Saundersterms, spin-orbit interaction, thermal energy and magnetic property. Magnetic moment for different multiple widths,multiple width large compared to kT, multiple width small compared to kT. Multiple widthcomparable to kT.Stereo chemical applications of magnetic properties of the first transition series, lanthanides and actinides, determination of magnetic susceptibility by different methods. Derivation of Van Vleck formula for susceptibility.

3. Fundaments of Mossbauer spectroscopy

Introduction of Mössbauer Spectroscopy. Principle and evaluation of Mossbauer effect. Recoil energy, Doppler effect. Experimental techniques.Isomer shift, quadrupole splitting and applications.

4. Uses of Inorganic reagents in inorganic analysis

General discussion and uses of some inorganic reagents: Potassium bromated (KBrO3), potassium iodate(KI03), ammonium vanadate (NH4VO3), ceric sulphate [Ce(S04)2], ethylenediaminetetra acetic acid (EDTA).

5. Chemistry in nanoscience and technology

Introduction, definition of nanomaterials andnano technology.History of nanomaterials, causes of interest in nanomaterials, properties and types. Synthesis of nanomaterials, their characterization techniques and applications of nanomaterials .

Reference Books

2-vaishali nagar, Near Amrapali railway crossing, Raiya road, Rajkot-360001. Ph.No.-(0281)2440478, 2472590	**3-vaishali nagar, Near Amrapali railway crossing, Raiya road, Rajkot-360001. Ph.No.-(0281)2471645**	**Behind marketing yard, Near Lalpari lake, Between Amagadh-Bhichri, Rajkot-360002. Ph.No.-90990 63150**

1. Introduction to Quantum Chemistry, A. K. Chandra, McGraw-Hill.
2. Advanced Inorganic Chemistry, Cotton Wilkinson, W S E Wiley.
3. Vogel's Text book of Quantitative Inorganic Analysis, ELBS Press.
4. Elements of Magneto Chemistry, Shyamal&Datta East- West Press.
5. Quantum Chemistry, Ira N. Levine, Prentice-Hall International.
6. Textbook of Inorganic Chemistry Vol.I& II, A.Singh & R.Singh, Campus.
7. Physical Methods in Chemistry, R.S.Drago , Saunders College.