

DEVI AHILYA VISHWAVIDYALAYA, INDORE

M.Sc. CHEMISTRY (SEMESTER –IV)

Paper No. : **II (Code-MCH-512)**
 Compulsory / Optional : **Compulsory**
 Max. Marks : **100**

PAPER II: SOLID STATE CHEMISTRY

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| Unit-1 | Solid State Reactions General principles, experimental procedure, co-precipitation as a precursory to solid state reactions, kinetics of solid state reactions. |
| Unit-2 | Crystal Defects and Non-Stoichiometry Perfect and imperfect crystals, intrinsic and extrinsic defects-point defects, line and plane defects, vacancies-Schottky defects and Frenkel defects. Thermodynamics of Schottky and Frenkel defect formation, colour centres, non-stoichiometry and defects. |
| Unit-3 | Electronic Properties and Band Theory Metals insulators and semiconductors, electronic structure of solids band theory band structure of metals, insulators and semiconductors, Intrinsic and extrinsic semiconductors, doping semiconductors, p-n junctions, super conductors. Optical properties-Application of optical and electron microscopy. Magnetic Properties-Classification of materials : Effect of temperature calculation of magnetic moment, mechanism of ferro and anti ferromagnetic ordering super exchange. |
| Unit-4 | Organic Solids Electrically conducting solids. organic charge transfer complex, organic metals, new superconductors. |
| Unit-5 | Liquid Crystals: Types of liquid crystals: Nematic, Smectic, Ferroelectric, Antiferroelectric, Various theories of LC, Liquid crystal display, New materials. |

Books Suggested:

1. Solid state chemistry and its applications, A.R. West. Peenum.
2. Principles of the Solid State, H.V. Keer, Wiley Eastern.
3. Solid State Chemistry, N.B. Hannay.
4. Solid State Chemistry, D.K. Chakrabarty, New Wiley Eastern.