

Syllabus for Lateral Entry Common Entrance Test for admission to 3rd semester in B. E./ B. Tech Programme, University of Kashmir, effective from academic session 2012

1. Mathematics

Differential Equations:

Solution in Series. Partial differential equations of first order and higher order Lagrange's Linear Equations. Homogenous Linear equation with constant coefficients; non-homogenous linear differential equations. Applications of partial differential equations, Heat Flow Equation. Wave equation. Solution by methods of Separation of Variables.

2. Physics

Phase Space and thermodynamic probability. Boltzmann distribution and Maxwell's distribution.

Black-body radiation; Stefan's Law, Ray-Leigh-Jeans Law and ultraviolet catastrophe; Wiens Displacement Law and Planck's Law.

Compton effect, uncertainty relation and its applications. Schrodinger equation and its application to One dimensional problem-Simple harmonic oscillator. Bohr's quantization condition and its application to material oscillators.

3. Chemistry

- i) Molecular Structure and Bonding: The VSEPR model, Valence bond theory, molecular orbital theory, molecular orbital theory of solids, semiconductors
- ii) High Polymers: Monomers and their function. Polymer definition. Classification of Polymers. Constituents of Plastics, thermosetting and thermoplastic resins, silicones and their industrial applications. Natural Rubber, Vulcanization and uses of rubber
- iii) Probes (Tools) for Structural Elucidation: Molecular Absorption Spectroscopy. Chronophers. Magnetic Resonance Spectroscopy-Principles and application to simple molecules and Introduction to Photoelectron Spectroscopy
- iv) Lubricants: Lubrication mechanism, classification of Lubricants semisolid and *liquid* lubricants. viscosity and viscosity index criteria for selection of *Lubricants for specific* purposes.

4. Machine Drawing and Engineering Graphics

Types of Sections. Standard Sectioning Practices. Representation of screw threads. *Various* types of screw threads, lacking devices. Foundation Bolts. Types of Bearings. *Journal* bearings. Pivot bearings. Thrust bearings. Ball bearings. Working drawing with *the help of* computer software link, AutoCAD. Engineering graphics' Technical *drawing-a Visual* Science. Types of engineering Drawing.

Theory of Projections: Relevance of Projection. Theory of Projections. *Perspective* Orthographic. Axonometric and their basic principles. systems of *orthographic projection*