Lesson Plan

Physics – PH-601

Paper – XI : Solid State and Nano Physics

Teacher name: Dr. Dr. SK Pandey

April 2021

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| Crystalline and glassy forms, liquid crystals, crystal structure, periodicity, lattice and basis, crystal translational vectors and axes. Unit cell and Primitive Cell, Winger Seitz primitive Cell, symmetry operations for a two dimensional crystal, Bravais lattices in two and three dimensions. Crystal planes and Miller indices, Interplaner spacing, Crystal structures of Zinc Sulphide, Sodium Chloride and Diamond. |

May 2021

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| Unit II: Crystal Structure II X-ray diffraction, Bragg's Law and experimental X-ray diffraction methods. K-space and reciprocal lattice and its physical significance, reciprocal lattice vectors, reciprocal lattice to a simple cubic lattice, b.c.c. and f.c.c. Unit III: Super conductivity Historical introduction, Survey of superconductivity, Super conducting systems, High Tc Super conductors, Isotopic Effect, |

June 2021

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| Critical Magnetic Field, Meissner Effect, London Theory and Pippards’ equation, Classification of Superconductors (type I and Type II), BCS Theory of Superconductivity, Flux quantization, Josephson Effect (AC and DC), Practical Applications of superconductivity and their limitations, power application of superconductors. Unit IV: Introduction to Nano Physics Definition, Length scale, Importance of Nano-scale and technology, History of Nantechnology, Benefits and challenges in molecular manufacturing. Molecular assembler concept, Understanding advanced capabilities. |

July 2021

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| Vision and objective of Nano-technology, Nanotechnology in different field, Automobile, Electronics, Nano-biotechnology, Materials, Medicine. |