

Teaching Plan(Session 2022-23)

Class- B.Sc 3

Teacher Name-Balwinder Kaur

Subject-Physics

Period No. 4

Name of Paper- Condensed Matter Physics ,Electronics

| Sr. No. | Date | Topics to be covered |
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| 1. | 14/10/2022-20/10/2022 | Crystal Structure. Symmetry operations for a two dimensional crystal. Two dimensional Bravais lattices, Three dimensional Bravais lattices" Basic primitive cells. Crystal planes and Miller indices. |
| 2. | 21/10/2022-30/10/2022 | Diamond and NaCl structure. Packing fraction for Cubic and hexagonal closed packed structure.Crystal Diffraction: Bragg's Law, Experimental methods for crystal structure studies, laue equations |
| 3. | 31/10/2022-07/11/2022 | Reciprocal lattices of SC, BCC and FCC, Bragg's Law in reciprocal lattice. Brillouin zones and its derivation in two dimensions, Structure factor and atomic form factor. |
| 4. | 08/11/2022-14/11/2022 | Junction transistor: structure and working, relation between different currents in transistors, Sign conventions. Amplifying action, Different configurations of a transistor and their comparison, CB and CE characteristics. |
| 5. | 15/11/2022-20/11/2022 | MST Exams |
| 6. | 21/11/2022-5/12/2022 | Structure, Characteristics, operation of FET, JFET and MOSFET, Pinch off voltage, Enhancement and Depletion mode, Comparison of JFETs and MOSFETs, Difference in field effect transistor and junction type transistor.Photo-conductive devices: Photo-conductive cell, Photodiode, Solar cell, LED, LCD. |
| 7. | 07/02/2023-15/02/2023 | Lattice vibrations, Concepts of phonons, Scattering of protons by phonons. Vibration of mono-atomic, di-atomic, linear chains. Density of modes, Einstein and Debye models of specific heat, Free electron model of metals. |
| 8. | 16/02/2023-01/03/2023 | Free electron, Fermi gas and Fermi energy.Band theory, Kronig-Penney Model. Metals and insulators, Conductivity and its variation with temperature in semiconductors, Fermi levels in intrinsic and extrinsic semiconductors |

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| 9. | 02/03/2023-15/03/2023 | Qualitative discussion of band gap in semiconductors, superconductivity, Magnetic field effect in superconductors, BCS theory. Thermal properties of superconductors Thyristor, SCR, TRIAC, DIAC: Construction, Characteristics and Operation; Comparison between transistors and thyristors; Difference between SCR and TRIAC. |
| 10. | 16/03/2023-28/03/2023 | SCR, TRIAC, DIAC: Construction, Characteristics and Operation; Comparison between transistors and thyristors; Difference between SCR and TRIAC UJT: its construction, Equivalent circuit, Characteristics and parameters, uses. |
| 11. | 29/03/2023-03/04/2023 | MST Exams |
| 12. | 04/04/2023-25/04/2023 | Thermistor: Types, Construction, Characteristics, Uses, Advantages over other temperature sensing devices IMPATT and TRAPATT devices, PIN diode: Construction, Characteristics, Applications. |
| 13. | 26/04/2023-20/05/2023 | Revision |