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| **University of Kerala** | | |
| Discipline: Physics |  | Time: 1 Hour 30 Minutes (90 Mins.) |
| Course Code: UK1DSCPHY102 |  | Total Marks: 42 |
| Course Title: **PROPERTIES OF SOLIDS** |  |  |
| Type of Course: **DSC** |  |  |
| Semester: 1 |  |  |
| Academic Level: 100-199 |  |  |
| Total Credit: 3, Theory: 3 Credit  (Applicable for 4 Credit Course with 1 Credit Practical Also) |  |  |

Part A. 6 Marks. Time: 6 Minutes. (Cognitive Level: Remember/Understand) Objective Type. 1 Mark Each. Answer All Questions

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| **Qn.**  **No.** | **Question** | **Cognitive Level** | **Course Outcome (CO)** |
| 1. | Define Superconductivity. | Understand | 3 |
| 2. | What is the term for external magnetic field that must be applied to a magnetized material to reduce its magnetization to zero? | Remember | 2 |
| 3. | Explain the term doping. | Understand | 1 |
|  | Describe isotope effect. | Understand | 3 |
| 5. | Name the phenomenon of ice melting under pressure and refreezing when the pressure is reduced | Remember | 4 |
| 6 | During fusion, energy is required even though temperature is constant. Explain. | Understand | 4 |

Part B. 8 Marks. Time: 24 Minutes. (Cognitive Level: Understand/Apply) Short Answer. 2 Marks Each. Answer All Questions

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course Outcome (CO)** |
| **7.** | Explain Wiedmann- Franz law. | Understand | 4 |
| 8. | Briefly describe any two applications of superconductivity. | Apply | 3 |
| 9. | Sketch the potential energy diagram for H2 molecule. | Apply | 1 |
| 10. | What is curie temperature? | Understand | 2 |

Part C. 28 Marks. Time: 60 Minutes. (Cognitive Level: Apply/Analyse/Evaluate/Create)

Long Answer. 7 marks each. Answer all 4 Questions, choosing among options\* within each question.

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course Outcome (CO)** |
| 11. | 1. i)Apply your knowledge of bonding in solids to explain the different types of bonds (4 marks)   ii) What are solar cells (3 marks)  OR   1. Distinguish between bipolar transistor and MOSFET. | Apply | 1 |
| 12. | 1. i) State and explain Curie-Weiss law (3- Marks)   ii) Differentiate between antiferromagnetism and ferrimagnetism (4 Marks)  OR   1. i)Derive the relation between permeability and susceptibility (4 marks)   ii) A field of strength of 300Am-1 produces a magnetization of 4400Am-1 in a ferromagnetic material. What is the relative permeability of the material (3 marks) | Apply | 2 |
| 13. | 1. Distinguish between Type1 and Type 2 superconductors. Draw the magnetization vs magnetic field curve.   OR   1. i)Sketch Meissner effect (3 marks)   ii) A superconducting sample has a critical temperature of 3.722K in zero magnetic field and a critical field of 0.0305T at 0K. Evaluate the critical field at 2 K (4 Marks) | Apply | 3 |
| 14 | 1. i)Present the key principles of fusion -(4 marks)   ii) Explain its practical applications-(3 marks)  OR   1. i)Describe the important thermoelectric effects such as Seebeck, Peltier and Thomson effects (6 marks)   ii) Are Peltier and Thomson effects reversible (1 mark) | Apply | 4 |