**Code No.BS104HS**

**METHODIST COLLEGE OF ENGINEERING & TECHNOLOGY**

**(An Autonomous Institution)**

**B.E. (CSE/AI&DS) I-Semester (AICTE) Examination, March-2023**

**Subject: APPLIED PHYSICS**

**Time: 3 hours Max.Marks:60**

**Note: Missing data, if any, maybe suitably assumed.**

**PART-A**

**Answer all the questions.**

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| --- | --- | --- | --- | --- |
| **Q.No.** | **Questions** | **Marks** | **CO** | **BTL** |
| **1. a** | What are the limitations of free electron theory of metals?  |  **2** | **1** |  **1** |
|  **b** | Classify intrinsic and extrinsic semiconductors | **2** | **1** | **2** |
| **c** | What are the applications of Ferro electric materials? | **2** | **2** | **1** |
| **d** | Write the differences between soft and hard magnetic materials.. | **2** | **2** | **2** |
| **e** | Define persistent current and critical current. | **2** | **3** | **1** |
| **f** | Explain De-Broglie’s concept of matter waves. | **2** | **3** | **4** |
| **g** | Explain stimulated emission with diagram. | **2** | **4** | **2** |
| **h** | The refractive index of core is 1.45 and that of cladding is 1.43 for a step index fiber. Evaluate NA and acceptance angle. | **2** | **4** | **5** |
| **i** | List any four applications of a solar cell? | **2** | **5** | **1** |
| **j** | Explain the significance of surface to volume ratio at a Nano scale. | **2** | **5** | **2** |

**PTO**

**PART-B**

**Answer Any Five questions**.

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| **Q.No.** |  |  **Questions** | **Marks** | **CO** | **BTL** |
| **2.** | **a** | Explain Kronig - penny model based on the basis of Band theory. | **5** | **1** | **5** |
| **b** | Explain Hall effect and list four applications of Halleffect. | **3** | **1** | **2** |
| **3.** | **a** | Explain various types of polarizations that occur in dielectric materials.  | **5** | **2** | **2** |
| **b** | Explain the Weiss domain theory of Ferro magnetism with diagram. | **3** | **2** | **2** |
| **4.** | **a** | Distinguish Type-I and Type-II super conductors.  | **3** | **3** | **4** |
| **b** | Build Schrodinger’s time independent wave equation. | **5** | **3** | **3** |
| **5.** | **a** | Explain the construction and working of Ruby laser.  | **5** | **4** | **2** |
| **b** | Explain propagation of light through optical fiber. | **3** | **4** | **2** |
| **6.** | **a** | Explain electron beam evaporation method to prepare thin films. | **5** | **5** | **2** |
| **b** | Summarize the basic ideas of carbon Nano tubes. | **3** | **5** | **2** |
| **7.** | **a** | Explain I-V characteristics of P-N junction diode. | **4** | **1** | **4** |
| **b** | Classify soft and hard magnetic materials. | **4** | **2** | **2** |
| **8.** | **a** | Interpret the significance of wave function ψ | **4** | **3** | **2** |
| **b** | Explain the structure of optical fiber with neat diagram. | **4** | **4** | **2** |
| **9.** | **a** | Explain Ball Milling method to prepare Nano powders. | **5** | **5** | **2** |
| **b** | Explain the characteristics of lasers. | **3** | **4** | **5** |

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