**Code No. BS204HS**

**METHODIST COLLEGE OF ENGINEERING & TECHNOLOGY**

**(An Autonomous Institution)**

**B.E. (ECE/EEE) II-Semester (AICTE) Examination, SEPTEMBER-2023**

**Subject: APPLIED PHYSICS**

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

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

**PART-A**

**Answer All the questions.(10X2M=20M)**

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| --- | --- | --- | --- | --- |
| **Q.No.** | **Questions** | **Marks** | **CO** | **BTL** |
| **1. a** | Draw the band energy diagrams of various soilds. | 2 | 1 | 2 |
| **b** | Distinguish between p-type and n-type semiconductors. | 2 | 1 | 1 |
| **c** | List out various types of polarizabilities that occur in a dielectric material. | 2 | 2 | 2 |
| **d** | Define magnetic flux density and write its units. | 2 | 2 | 1 |
| **e** | Write a short note on persistence current in a super conductor. | 2 | 3 | 2 |
| **f** | Differentiate between matter wave and EM wave. | 2 | 3 | 2 |
| **g** | State any four applications of laser in engineering and industry. | 2 | 4 | 1 |
| **h** | Draw the internal structure of optical fibreand label the parts. | 2 | 4 | 3 |
| **i** | Define Photo voltaic effect. | 2 | 5 | 2 |
| **j** | Write a short note on CNT’s | 2 | 5 | 1 |

**PART-B**

**Answer Any Five questions**.**(5X8M=40M)**

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| **Q.No.** |  | **Questions** | **Marks** | **CO** | **BTL** |
| 2. | a | State Hall effect. Derive the Hall voltage and Hall coefficient for n-type semiconductor | 5 | 1 | 2 |
| b | Explain formation of P-N junction diode | 3 | 1 | 3 |
| 3. | a | Differentiate between hard and soft magnetic materials on the basis of domain theory | 5 | 2 | 2 |
| b | How electronic polarizability is different from ionic polarizability. | 3 | 2 | 3 |
| 4. | a | Write the differences between Type-I and Type-II superconductors. | 5 | 3 | 3 |
| b | Calculate the energy difference between the ground state and third excited state of an electron in I-D box of length 10-8cm. | 3 | 3 | 3 |
| 5. | a | What is acceptance angle ? Derive the expression for Numerical aperture of an optical fibre | 5 | 4 | 2 |
| b | Difference between spontaneous and stimulated emission | 3 | 4 | 2 |
| 6. | a | Enlist various types of thin film fabrication techniques. | 5 | 5 | 2 |
| b | Write any six applications of nano materials. | 3 | 5 | 1 |
| 7. | a | Derive expression for electrons concentration in conduction band of an intrinsic semiconductor. | 4 | 1 | 3 |
| b | Describe the structure of Barium Titanate. | 4 | 2 | 2 |
| 8. | a | Derive at the Schrödinger time independent wave equation for a free particle. | 4 | 3 | 3 |
| b | With the help of neat sketch explain various components of laser | 4 | 4 | 2 |
| 9. | a | Write a short note on increase in surface area to volume ratio and quantum confinement effect of nano materials. | 4 | 5 | 1 |
| b | Explain I-V characteristics of PN-diode. | 4 | 1 | 2 |

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