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| **I B.Tech I Semester Regular Examinations, July 2021**  **APPLIED PHYSICS – MODEL PAPER**  **Time: 2 hours Max Marks: 70**  **Answer any FIVE questions. All questions carry equal marks.** |

**5 \* 14 Marks = 70 Marks**

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| **Q No** | **Questions** | **Marks** |
| 1. | **(a)** Describe Davisson- Germer’s experiment to verify wave nature of matter. | [9] |
| **(b)** An electron is bound in one-dimensional potential box of size 1 x 10-10 m. Find the energy values in the ground state and first two excited states | [5] |
| 2. | **(a)** Derive the expression for carrier concentration of P-type semiconductor. | [9] |
| **(b)** Explain the operation of Zener diode and draw its I-V characteristics | [5] |
| 3. | **(a)** Explain the construction and working of Semiconductor LASER. | [9] |
| **(b)** Differentiate between Spontaneous and Stimulated emission. | [5] |
| 4. | **(a)** What are Einstein’s coefficients? Derive the relation between them. | [9] |
| **(b)** Distinguish between Step index and Graded index fibers. | [5] |
| 5. | **(a)** What is Ionic polarization? Derive the expression for Ionic polarizability. | [9] |
| **(b)** Draw the magnetic hysteresis curve in ferro magnet and identify retentivity and coercivity. | [5] |
| 6. | **(a)** Describe the construction, principle, working of NPN bipolar junction transistor. | [10] |
| **(b)** What are the advantages and disadvantages of Solar cell? | [4] |
| 7. | **(a)** Define and derive the expressions for acceptance angle. | [9] |
| **(b)** Write a short note on (i) Meissner effect (ii) applications of superconductors | [5] |
| 8 | **(a)** Derive an expression for Schrödinger’s time independent wave equation. Explain the physical significance of Wave function. | [10] |
| **(b)** Write a short note on Ferrites. | [4] |

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