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**D.Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY**

**III**

**Q. Paper Code:**

**22FY103202**

**KASABA BAWADA KOLHAPUR-416006**

**(An Autonomous Institute)**

F. Y. B. Tech, Sem-I

**Backlog Exam (END SEMESTER EXAMINATION), August. 2022**

**Course Name: Engineering Physics, Course Code: 201GEL103**

Seat No:

**Day and Date: Tuesday,23.08.2022**

**Time: 10.00 am to 12.00 pm Max. Marks- 50**

1. Figure to the right indicate **full marks**.
2. **Assume standard data**, whenever necessary
3. Use of **non-programmable** calculator isallowed

iv**. Given**: - Charge on electron (e)= 1.6 x 10-19 C, Mass of proton= 1.67 x10-27 Kg

| **BT** | **CO’s** | **Q. No.** | **Statement of Question** | **Marks** |
| --- | --- | --- | --- | --- |
|  |  | **Q.1** | **Attempt the following questions. (20 Marks)** |  |
| L2 | 103.1 | **a** | Derive an Expression for Grating equation for plane transmission grating to diffract light from slit. | 6 |
| L2 | 103.2 | **b** | Derive a differential equation for Damped Harmonic Oscillator and also find solution for it. | 7 |
| L3 | 103.3 | **c** | Derive an equation for fermi energy for intrinsic and n-type semiconductor with neat labelled energy diagram. | 7 |
|  |  | **Q.2** | **Attempt the following questions.** (10 Marks) |  |
| L2 | 103.3 | **a** | Derive an expression for de Broglie matter waves and express it in two different forms.  **OR**  Derive an equation for Schrodinger time dependent wave equation. | 6 |
| L3 | 103.3 | **b** | Find the energy of an electron moving in one dimension in an infinitely high potential box of width 1.0Å (h = 6.63 x 10-34J.S) | 4 |
|  |  | **Q.3** | **Attempt the following questions. (10 Marks)** |  |
| L2 | 103.4 | **a** | Explain the following terms with neat labelled diagram,  ii) Stimulated emission ii ) spontaneous emission iii) Metastable state  **OR**  Obtain an expression for maximum acceptance angle for optical fibre for the propagation of signals though it. | 6 |
| L3 | 103.4 | **b** | Discuss the characteristics of LASER in detail. | 4 |
|  |  | **Q.4** | **Attempt following questions (10 Marks)** |  |
| L2 | 103.4 | **A** | Describe the High energy Ball milling method technique used for the preparation of nanoparticles. | 6 |
| L1, L2 | 103.4 | **B** | Discuss the engineering, medical, defense and research applications of nanomaterials.  **OR**  Describe the Colloidal method technique used for the preparation of nanoparticles | **4** |

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