**MODEL-3**

| St. Peter's Engineering College (Autonomous)<br>Dullapally (P), Medchal, Hyderabad – 500100.<br>I - Mid Term Examination – March 2024 | | | | | | Dept. | : | S&H |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Academic Year 2023-24 | | |
| Subject Code | : | AS22-00BS11 | Subject | : | Applied Physics | | | |
| Class/Section | : | B. Tech. (ECE/EEE) | Year | : | I | Semester | : | II |
| Duration | : | 120 Min | Max. Marks | : | 30 | Date: | : | |

| BLOOMS LEVEL | | | | | |
|---|---|---|---|---|---|
| Remember | L1 | Understand | L2 | Apply | L3 |
| Analyze | L4 | Evaluate | L5 | Create | L6 |

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**PART – A (10x1M = 10M)**

**Note: Answer all Questions. Each Question carries equal marks.**

| Q. No | Question (s) | Marks | BL | CO |
|---|---|---|---|---|
| | **UNIT - I** | | | |
| **1** | **a)** Define workfunction of a material using photoelectric equation. | **1M** | L1 | C122.1 |
| | **b)** What is de Broglie wavelength? | **1M** | L2 | C122.1 |
| | **c)** Explain the Heisenberg's Uncertainty principle. | **1M** | L2 | C122.1 |
| | **d)** Write difference between matter phase and group velocity. | **1M** | L2 | C122.1 |
| | **UNIT-II** | | | |
| | **e)** What is hall voltage? | **1M** | L1 | C122.2 |
| | **f)** Describe the working principle of APD. | **1M** | L1 | C122.2 |
| | **g)** Distinguish PN diode and Zener diode. | **1M** | L2 | C122.2 |
| | **h)** Explain V-I characteristics of PN diode. | **1M** | L2 | C122.2 |
| | **UNIT-III** | | | |
| | **i)** Define dielectric materials with examples. | **1M** | L1 | C122.3 |
| | **j)** Interpret classification of polarizations. | **1M** | L2 | C122.3 |

**PART – B (20M)**

| Q. No | Question (s) | Marks | BL | CO |
|---|---|---|---|---|
| | **UNIT – I** | | | |
| **2** | a) Derive energy eigen value for 1-d potential box for a free particle. | **4M** | L2 | C122.1 |
| | **b)** Derive expression for de-Broglie wavelength? | **4M** | L2 | C122.1 |

| | | | | |
|---|---|---|---|---|
| **OR** | | | | |
| **3** | Write construction and working of photoelectric effect experiment with the help of neat diagram. | **8M** | L2 | C122.1 |
| **UNIT – II** | | | | |
| **4** | Explain advantage PIN diode over APD diode. | **4M** | L2 | C122.2 |
| | Describe the hall effect and derive the hall coefficient and hall voltage | **4M** | L2 | C122.2 |
| **OR** | | | | |
| **5** | Explain the figure of merits of a solar cell. | **4M** | L2 | C122.2 |
| | Explain working principle and structure of PIN diode. | **4M** | L2 | C122.2 |
| **UNIT-III** | | | | |
| **6** | Explain ferroelectric material. | **2M** | L2 | C122.3 |
| | Define dielectric materials with example. | **2M** | L1 | C122.3 |
| **OR** | | | | |
| **7** | Differentiate between ferro, piezo and pyro electric properties. | **4M** | L4 | C122.3 |