



# MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi &amp; Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade &amp; Recognized Under Section 2(f) &amp; 12(B) of the UGC act, 1956

I B.Tech II Sem Supply End Examination, March 2022

## Applied Physics (CSE, CSI, CSM, EEE, IT)

**Time: 3 Hours.****Max. Marks: 70**

Note: 1. Answer any FIVE questions.

2. Each question carries 14 marks and may have a, b as sub questions.

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|---|----|--|----|-----|-----|
| 1 | a) | Discuss Plank's quantum theory of black body radiation.  | 7M | C01 | BL2 |
|   | b) | Give the Born's physical interpretation of the wave function   | 7M | C01 | BL1 |
| 2 | a) | Discuss the solution for a particle in a one dimensional potential well of infinity height.                      | 7M | C01 | BL2 |
|   | b) | Explain photoelectric effect in detail.  | 7M | C01 | BL4 |
| 3 | a) | Discuss the dependence of Fermi level on carrier concentration and temperature.                                  | 7M | C02 | BL2 |
|   | b) | Distinguish between drift and diffusion transport of carriers in semiconductors.                                 | 7M | C02 | BL2 |
| 4 | a) | Describe the construction, V-I characteristics and working of Zener diode.                                       | 7M | C02 | BL2 |
|   | b) | Explain the structure, working principle and characteristics of PIN photodiode.                                  | 7M | C03 | BL4 |
| 5 | a) | Describe the radiative and non-radiative recombination mechanisms in semiconductors.                             | 7M | C03 | BL2 |
|   | b) | Discuss structure, working principle, and characteristics of an avalanche photodiode                             | 7M | C03 | BL2 |
| 6 | a) | Explain the construction, energy level diagram and lasing action in He-Ne gas laser in detail.                   | 7M | C04 | BL4 |
|   | b) | Write down the applications of lasers in detail  | 7M | C04 | BL1 |
| 7 | a) | Explain the principle of light propagation in optical fibers   | 7M | C04 | BL4 |
|   | b) | Describe the different types of polarizations in dielectric materials.   | 7M | C05 | BL2 |
| 8 | a) | Explain the domain theory of ferromagnetism with reference to the hysteresis curve.                              | 7M | C05 | BL4 |
|   | b) | Explain how the magnetic materials can be classified based on the orientation and alignment of magnetic moments. | 7M | C05 | BL4 |