

09-09-2021

Course Code: 2020006

Roll No:

MLRS- R20



MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

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

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

I B.Tech II Sem Regular End Examination, September 2021

Applied Physics (CSE, CSI, CSM, EEE, INF)

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) Illustrate Heisenberg's uncertainty hypothesis. | 7M | CO1 | BL4 |
| | b) Describe Davisson and Germer experiment to demonstrate the wave character of electrons. | 7M | CO1 | BL2 |
| 2 | a) Explain de-Broglie hypothesis. | 7M | CO1 | BL4 |
| | b) Derive Schrodinger's time independent wave equation for a particle. | 7M | CO1 | BL5 |
| 3 | a) Distinguish between intrinsic and extrinsic semiconductors. | 7M | CO2 | BL2 |
| | b) Describe the construction and V-I characteristics of p-n junction diode. | 7M | CO2 | BL2 |
| 4 | a) Show that the Hall coefficient is inversely proportional to the number of electrons per unit volume. | 7M | CO2 | BL3 |
| | b) Describe the device structure, characteristics and figure of merit of LED. | 7M | CO3 | BL2 |
| 5 | a) Describe Radiative and Non-Radiative recombination mechanisms in semiconductors. | 7M | CO3 | BL2 |
| | b) Explain the structure, working principle and characteristics of Solar cell. | 7M | CO3 | BL4 |
| 6 | a) Explain the terms 'pumping', 'coherence', and population inversion in the process of production of lasers. | 7M | CO4 | BL4 |
| | b) Describe the principle, construction and working principle of Ruby laser. | 7M | CO4 | BL2 |
| 7 | a) Derive an expression for acceptance angle and hence define the numerical aperture. | 7M | CO4 | BL5 |
| | b) Explain the terms 'polarization', 'permittivity', and dielectric constant in dielectric materials | 7M | CO5 | BL4 |
| 8 | a) Derive Classius-Mossotti equation in case of solid dielectrics. | 7M | CO5 | BL5 |
| | b) Enlist the applications of magnetic materials in detail. | 7M | CO5 | BL1 |