



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 Supplementary Examination, September-2022

Applied Physics

(EEE, CSE & IT)

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

Note: 1. Question paper consists: Part-A and Part-B.

2. In Part - A, answer all questions which carries 20 marks.

3. In Part - B, answer any one question from each unit.

Each question carries 10 marks and may have a, b as sub questions.

PART- A**(10*2 Marks = 20 Marks)**

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|-------|---|----|-----|-----|
| 1. a) | What is photoelectric effect? | 2M | CO1 | BL1 |
| b) | Calculate the wavelength of an electron accelerated through a potential of 100 V. | 2M | CO1 | BL3 |
| c) | Depict the symbols of (i) p-n junction diode and (ii) Zener diode | 2M | CO2 | BL1 |
| d) | Distinguish intrinsic and extrinsic semiconductors. | 2M | CO2 | BL2 |
| e) | What is Avalanche breakdown? | 2M | CO3 | BL2 |
| f) | Outline the radiative recombination mechanism in semiconductors. | 2M | CO3 | BL3 |
| g) | Define (i) population inversion and (ii) pumping | 2M | CO4 | BL1 |
| h) | List the applications of optical fibers. | 2M | CO4 | BL1 |
| i) | What is Ampere's law? | 2M | CO5 | BL1 |
| j) | Mention any two applications of magnetic materials. | 2M | CO5 | BL1 |

PART- B**(10*5 Marks = 50 Marks)**

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|---|---|-----|-----|-----|
| 2 | Make use of Davisson and Germer experiment to prove the wave nature of electrons. | 10M | CO1 | BL3 |
|---|---|-----|-----|-----|

OR

- | | | | | |
|---|--|----|-----|-----|
| 3 | a) Formulate Schrodinger time independent wave equation. | 7M | CO1 | BL3 |
| | b) Interpret the importance of wave function. | 3M | CO1 | BL3 |
| 4 | a) What is Hall effect? Derive an expression for Hall coefficient. | 5M | CO2 | BL4 |
| | b) Explain the carrier generation and recombination processes. | 5M | CO2 | BL2 |

OR

- | | | | | |
|---|---|-----|-----|-----|
| 5 | Illustrate the I-V characteristics of p-n junction diode in forward and reverse bias. | 10M | CO2 | BL2 |
|---|---|-----|-----|-----|

6	Explain the structure, materials used, working principle and characteristics of solar cell.	10M	C03	BL2
OR				
7	Describe the structure, materials used and characteristics of semiconductor laser diode.	10M	C03	BL2
8	Explain the construction and working of Ruby laser.	10M	C04	BL3
OR				
9	a) Obtain the expression for numerical aperture and acceptance angle.	5M	C04	BL3
	b) Mention the losses associated with optical fiber.	5M	C04	BL3
10	a) List out the Maxwell's equations.	5M	C05	BL2
	b) Distinguish ferroelectric and piezoelectric materials.	5M	C05	BL4
OR				
11	a) What is Ferromagnetism? Explain the spontaneous magnetization with help of magnetic domains	5M	C05	BL3
	b) Explain the hysteresis in ferromagnetic materials.	5M	C05	BL2

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CO: Course Outcome

BL - Blooms Taxonomy Levels