



# 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 I Sem Supplementary Examination, October 2022

**Engineering Physics**

(CIVIL)

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

Note: 1. This question paper contains two parts A and B.

2. Part- A is Compulsory. Answer all Questions which carries 20 marks.

3. Part - B consists 5 units. 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=20Marks)**

- |       |   |    |      |      |
|-------|---|----|------|------|
| 1. a) | Using Newton's laws explain why heavier objects require more force than lighter objects to move or accelerate them? | 2M | CO-1 | BL-5 |
| b)    | Explain electromagnetic force.  | 2M | CO-1 | BL-2 |
| c)    | Explain restoring force and force constant.   | 2M | CO-2 | BL-2 |
| d)    | What is sharpness of resonance?   | 2M | CO-2 | BL-1 |
| e)    | Distinguish between longitudinal waves and transverse waves.  | 2M | CO-3 | BL-4 |
| f)    | What are standing waves?  | 2M | CO-3 | BL-1 |
| g)    | What happens when you increase the number of slits in a diffraction grating?  | 2M | CO-3 | BL-1 |
| h)    | What happens when you increase the distance between slits?  | 2M | CO-4 | BL-1 |
| i)    | What are characteristics of a Laser?  | 2M | CO-3 | BL-1 |
| j)    | Explain function of core and cladding in optical fiber.   | 2M | CO-4 | BL-2 |

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

- |      |   |    |      |      |
|------|---|----|------|------|
| 2 a) | Describe Newton's equations of motion in cylindrical coordinates. | 7M | CO-1 | BL-6 |
| b)   | Write a note on friction.   | 3M | CO-3 | BL-1 |

**OR**

- |      |   |    |      |      |
|------|---|----|------|------|
| 3 a) | Illustrate Newton's equations of motion in spherical coordinates.         | 6M | CO-3 | BL-2 |
| b)   | How Newton's laws illuminates completeness in describing particle motion. | 4M | CO-1 | BL-2 |

- |      |  |    |      |      |
|------|--|----|------|------|
| 4 a) | What is impedance? Distinguish between mechanical and electrical impedance | 5M | CO-1 | BL-4 |
| b)   | Write a note on Power observed by oscillator.                              | 5M | CO-3 | BL-1 |

**OR**

- |           |    |  |     |      |      |
|-----------|----|--|-----|------|------|
| 5         | a) | Derive an expression of electrical simple harmonic oscillations.                                     | 5M  | CO-3 | BL-6 |
|           | b) | Define damped harmonic oscillation and derive an equation for damped harmonic oscillators            | 5M  | CO-3 | BL-6 |
| 6         | a) | What are Harmonic waves? Discuss reflection and transmission of harmonic waves at a boundary.        | 10M | CO-3 | BL-6 |
| <b>OR</b> |    |  |     |      |      |
| 7         | a) | Describe the term impedance matching.  | 6M  | CO-3 | BL-6 |
|           | b) | Explain standing waves and their Eigen frequencies.  | 4M  | CO-3 | BL-5 |
| 8         | a) | With neat diagram explain Mach-Zehnder interferometer.   | 10M | CO-3 | BL-6 |
| <b>OR</b> |    |  |     |      |      |
| 9         | a) | Give critical analysis of Fraunhofer diffraction at a circular aperture.                             | 6M  | CO-3 | BL-4 |
|           | b) | What are the applications of Newton's rings?   | 4M  | CO-4 | BL-1 |
| 10        | a) | What is mean by acceptance angle for an optical fiber? Show how it is related to numerical aperture. | 5M  | CO-3 | BL-6 |
|           | b) | Briefly discuss the construction and working of a helium neon laser with the energy level diagram.   | 5M  | CO-3 | BL-6 |
| <b>OR</b> |    |  |     |      |      |
| 11        | a) | Describe the construction and working of Ruby laser.   | 5M  | CO-3 | BL-6 |
|           | b) | Describe the structure of different types of optical fibers with ray paths.                          | 5M  | CO-4 | BL-6 |

---oo0oo---