



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 I Sem Regular/Supply End Examination, April 2022

Engineering Physics

(Civil, Mechanical)

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 are the different types of forces in nature | 2M | C01 | BL2 |
| b) | Brief inertial and non-inertial frames. | 2M | C01 | BL5 |
| c) | Discuss Quality factor of damped harmonic oscillator | 2M | C02 | BL2 |
| d) | Distinguish between damped and forced oscillations | 2M | C02 | BL4 |
| e) | What is reverberation time? | 2M | C03 | BL2 |
| f) | What is acoustic quieting? | 2M | C03 | BL1 |
| g) | Why does a diffraction grating have closely spaced rulings | 2M | C04 | BL4 |
| h) | Differentiate between interference and diffraction | 2M | C04 | BL4 |
| i) | What is population inversion? Explain the necessity of population inversion for lasing action | 2M | C05 | BL1 |
| j) | What are the parts of an optical fibre and briefly explain them with neat diagram | 2M | C05 | BL5 |

PART- B

(10*5 Marks = 50 Marks)

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|-------|--|----|-----|------|
| 2. a) | State and explain the Newton's laws of motion with suitable examples | 5M | C01 | BL-! |
| b) | Show that Newton's second law is invariant | 5M | C01 | BL-! |

OR

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|-------|---|-----|-----|------|
| 3 | Derive the necessary equations for transformation of scalars and vectors under rotation | 10M | C01 | BL-! |
| 4. a) | Give analogy between electrical and mechanical simple harmonic oscillators | 5M | C02 | BL-! |
| b) | Explain the energy decay in a damped harmonic oscillator | 5M | C02 | BL-! |

OR

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|---|---|-----|-----|------|
| 5 | Discuss in detail the complex notation and phasor representation of Simple harmonic motion and physical quantities. | 10M | C02 | BL-! |
|---|---|-----|-----|------|

- 6 a) State and explain Sabine's formula for reverberation time. 5M C03 BL-5
b) Define absorption coefficient of a material and describe a method for its determination. 5M C03 BL-5
- OR**
- 7 Explain various factors affecting architectural acoustics and their remedies. 10M C03 BL-5
- 8 a) Describe the Young's double slit experiment. 5M C04 BL-6
b) Discuss in detail the phenomenon of interference by division of amplitude. 5M C04 BL-6
- OR**
- 9 Discuss in detail Fraunhofer diffraction due to a single slit and Obtain the condition for principal maximum and minimum. 10M C04 BL-6
- 10 a) Explain with neat diagram, the process of absorption of light, spontaneous emission and stimulated emission of light 5M C05 BL-2
b) Explain the construction and working principle of Ruby laser with the help of neat diagrams. 5M C05 BL-2
- OR**
- 11 What is meant by acceptance angle? Derive an expression for acceptance angle of an optical fibre. 10M C05 BL-5