



I B.Tech I Sem Supply Examination, December 2021

ENGINEERING PHYSICS
(CIVIL & MECH)

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)**

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|-------|---|----|------|------|
| 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)****UNIT-I**

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|------|---|----|------|------|
| 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

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|------|---|----|------|------|
| 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 |

UNIT-II

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|------|--|----|------|------|
| 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

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|------|---|----|------|------|
| 5 a) | Drive 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 |

UNIT-III

- 6 a) What are Harmonic waves? Discuss reflection and transmission of harmonic waves at a boundary. 10M CO-3 BL-6

OR

- 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

UNIT-IV

- 8 a) With neat diagram explain Mach-Zehnder interferometer. 10M CO-3 BL-6

OR

- 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

UNIT-V

- 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

OR

- 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

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