



## B. Tech I Semester Supplementary Examinations, January 2024

### ENGINEERING PHYSICS

(Common to CE & ME)

**Maximum Marks: 70**

**Date: 22.01.2024 Duration: 3 hours**

- Note:**
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

#### Part-A

All the following questions carry equal marks		10X2M=20Marks	Blooms Tx	CO
1.	Write two similarities between electrical and mechanical harmonic oscillators		L1	CO1
2.	Define Quality factor.		L2	CO1
3.	What is the longitudinal wave?		L1	CO2
4.	Define standing sound waves.		L1	CO2
5.	What are coherent sources.		L1	CO3
6.	What are the types of interference.		L1	CO3
7.	Define diffraction.		L1	CO3
8.	Write the expression for Bragg's law?		L2	CO3
9.	Write the components of laser?		L2	CO3
10.	Write about the structure of optical fibre.		L2	CO3

#### Part-B

Answer all the following questions		5X10M=50Marks	Blooms Tx	CO
11.	(a) What is an electrical harmonic oscillator? Obtain an expression the Frequency of oscillators. [5M] (b) Write about impedance in electrical and mechanical oscillators? [5M]		L3 L2	CO1 CO1
OR				
12.	(a) Derive the equation of motion of a simple harmonic oscillator and its total energy. [5M] (b) Describe the power absorbed by oscillator? [5M]		L2 L2	CO2
13.	Discuss the modes of vibration of a stretched string clamped at both ends. [10M]		L3	CO2
OR				
14.	(a) Explain the laws of transverse vibrations of a string. [5M] (b) Derive the plane acoustic equation and show that the velocity of sound wave in gas is $V = \sqrt{\left(\frac{\gamma P}{\rho_0}\right)}$ . [5M]		L3 L2	CO2 CO2

15.	What is interference of light? Describe Young's experiment for demonstration of interference of light? [10M]	L3	CO3
	OR		
16.	Describe the construction and working of a Michelson Interferometer? [10M]	L3	CO3
17.	Describe the Fraunhofer diffraction pattern due to circular aperture. [10M]	L3	CO3
	OR		
18.	Write about the resolving power of a grating? [10M]	L3	CO3
19.	With the help of suitable diagrams, Explain the construction and working of a ruby laser. [10M]	L3	CO3
	OR		
20.	Describe the basic elements of a fiber optics communication system with the help of block diagram. [10M]	L3	CO4