

**R16**

Code No: 132AF

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech I Year II Semester Examinations, September - 2023**

**APPLIED PHYSICS**  
**(Common to CE, ME, AE)**

**Time: 3 Hours**

**Max. Marks: 75**

**Note:** i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) 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**

**(25 Marks)**

- 1.a) Define Hooke's Law. [2]
- b) With suitable examples, explain the term elasticity. [3]
- c) What is reverberation in simple words? [2]
- d) Explain the transmission of sound and transmission loss. [3]
- e) List two applications of Ultrasonic waves. [2]
- f) Illustrate standing wave in ultrasonic. [3]
- g) What is the formula for the dielectric constant? [2]
- h) Explain Piezoelectricity. [3]
- i) Define Meissner effect. [2]
- j) Compare anti-ferro and ferri magnetic materials. [3]

**PART - B**

**(50 Marks)**

- 2.a) Explain stress and strain and derive the relation between them.
- b) Determine the relation connecting the elastic constants  $Y$ ,  $K$  and  $\sigma$ . [3+7]

**OR**

- 3.a) Examine the functioning of torsion pendulum and explain how the moment of inertia can be measured using torsion pendulum.
- b) If the volume of a liquid is compressed by 0.3%, how much pressure must be applied to the liquid? Given, Bulk modulus of water is  $21 \times 10^9 \text{N/m}^2$ . [7+3]

- 4.a) Evaluate the basic requirements of a good hall with suitable parameters.
- b) Compile all the factors affecting the architectural acoustics of a building and conclude how to overcome them. [4+6]

**OR**

- 5.a) Distinguish between reverberation and optimum reverberation.
- b) Determine an expression for reverberation time of an auditorium. [4+6]

- 6.a) Discuss about Piezoelectric effect and piezoelectric materials.
- b) Formulate with a neat circuit diagram, the magnetostriction method of production of ultrasonic waves. [4+6]

**OR**

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7.a) Explain one method of detection of Ultrasonic waves.

b) List out properties of Ultrasonic waves.

[6+4]

QA QA QA QA QA QA QA QA QA

8.a) Explain Pyro electricity.

b) Elaborate on the ferroelectric properties of BaTiO<sub>3</sub>.

[3+7]

**OR**

9.a) Explain polarization and write about different types of polarizations.

b) Formulate the Clausius- Mosotti Equation and explain its importance.

[4+6]

QA QA QA QA QA QA QA QA QA

10.a) Discuss about Dia, Para and Ferro magnetic materials.

b) Write applications of superconductors.

[3+7]

**OR**

11.a) Discuss about Magnetic permeability and susceptibility and derive the relation between them.

b) Distinguish between Hard and Soft magnetic materials.

[7+3]

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QA QA QA QA QA QA QA QA QA

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