

R16

Code No: 132AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year II Semester Examinations, April - 2018

APPLIED PHYSICS

(Common to CE, ME, MCT, MMT, AE, MIE, PTM, CEE, MSNT)

Time: 3 hours

Max. Marks: 75

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

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(25 Marks)

- 1.a) Write down Hooke's law. [2]
- b) Define rigidity modulus and also mention units. [3]
- c) Write down the Sabine's formulae [2]
- d) What are the limitations of Sabine's formula? [3]
- e) What are ultrasonic waves? [2]
- f) Write the applications of ultrasonic waves. [3]
- g) Define polarizability and susceptibility. [2]
- h) Write short notes on piezoelectricity. [3]
- i) What is superconductivity? [2]
- j) Explain the origin of magnetization. [3]

PART-B

(50 Marks)

- 2.a) Derive the expression of work done for unit volume in deforming a body.
- b) Explain the determination of rigidity modulus using torsional pendulum. [5+5]

OR

- 3.a) Discuss about elastic behavior of a material and factors affecting elasticity.
- b) Explain about relation between three moduli of elasticity. [5+5]

- 4.a) State the acoustic requirements of a good auditorium. Explain how these requirements can be achieved.

- b) Derive the Sabine's formula for reverberation time. [5+5]

OR

- 5.a) Explain how the absorption coefficient of an acoustic material can be determined.
- b) State any five factors affecting the acoustics of the building and suggest their remedies. [5+5]

- 6.a) Explain the phenomenon of magnetostriction.
- b) Determine the velocity of sound in a liquid with a neat sketch. [5+5]

OR

- 7.a) What is the piezoelectric effect? Explain the production of ultrasonic using piezoelectric crystal.

- b) Explain the use of ultrasonic waves for non-destructive testing and in SONAR. [5+5]

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- 8.a) What are the important characteristics of ferroelectric materials?
b) Derive Clausius-Mosotti relation for dielectrics. [5+5]

OR

- 9.a) Derive an expression for ionic polarizability.
b) Explain the phenomenon of ferroelectricity with particular reference to Barium Titanate. [5+5]

- 10.a) What is meant by domain? Explain the importance of hysteresis curve.
b) Explain the properties of Anti-ferro and ferri magnetic materials. [5+5]

OR

- 11.a) Explain the properties of superconductors and write types of superconductors.
b) Briefly discuss about Meissner Effect. [5+5]

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