

**R16**

Code No: 132AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year II Semester Examinations, August/September - 2017

APPLIED PHYSICS

(Common to CE, ME, MCT, MMT, MIE, 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) Define Hooke's Law. [2]
- b) What is the elastic limit? [3]
- c) Explain acoustic quieting. [2]
- d) What are sound absorbing materials? [3]
- e) What are ultrasonic waves? [2]
- f) Define the term Ferro-electricity? [3]
- g) What is Pyro-electricity? [2]
- h) Discuss behaviour of BaTiO<sub>3</sub> structure. [3]
- i) Define Permeability. [2]
- j) Show that  $\mu_r = (1+\chi)$ . [3]

**PART-B**

(50 Marks)

- 2.a) Discuss the term bulk modulus.
- b) What is the effect of temperature on elasticity of a material? [5+5]

OR

- 3.a) Discuss calculation of rigidity modulus of Torsional pendulum.
- b) Distinguish between stress and strain. [5+5]

- 4.a) Discuss Sabine's formula for reverberation of time.
- b) What are the factors affecting the acoustic of building. [5+5]

OR

- 5.a) Mention the basic requirement of acoustically good hall.
- b) Discuss the term absorption coefficients. [5+5]

- 6.a) How ultrasonic waves are used in non-destructive testing.
- b) What are the applications of ultrasonic waves? [5+5]

OR

- 7.a) Give an account of the methods used in the detection of ultrasonic waves.
- b) Discuss production of ultrasonic waves by using magnetostriction method. [5+5]

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8.a) Explain the phenomenon of electronic polarization in dielectrics. Derive an expression for that.

b) Derive Clausius – Mosotti relation. [5+5]

OR

9.a) Derive an expression for orientation polarization. AG AG AG AG A  
b) What is piezo-electric effect? Describe the process to produces piezoelectric effect in quartz crystal. [5+5]

10.a) Drive an expression for Bohr magneton.

b) Discuss classification of magnetic materials. [5+5]

OR

11.a) Explain hysteresis curve based on domain theory. AG AG AG AG A  
b) What is superconductivity? Explain Meissner's effect. [5+5]

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