R16

Code No: 132AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD
B.Tech I Year II Semester Examinations, May - 2019
APPLIED PHYSICS
(Common to CE, ME, MCT, 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)   Define stress, strain and write their units.   [2]
  b)   Define Poisson's ratio.   [3]
  c)   What is the Sabine's formula? Explain   [2]
  d)   What is acoustic quieting?   [3]
  e)   What is Piezoelectric effect?   [2]
  f)   What are the properties of ultrasonics?   [3]
  g)   Explain dielectric constant & electrical susceptibility.   [2]
  h)   Distinguish between Ferro-electricity and Piezoelectricity.   [3]
  i)   What is Bohr magneton?   [2]
  j)   Explain ferromagnetism.   [3]

PART-B

                                                          (50 Marks)

2.   What is the Torsional pendulum? Explain how it is used to determine the rigidity modulus of a given wire.   [10]

OR

3.   Derive the relation between three modules of elasticity.   [10]

4.   Explain various factors affecting architectural acoustics and their remedies.   [10]

OR

5.a)   What are the requisites for good acoustics?
  b)   Describe the method of measurement of sound absorption coefficient.   [4+6]

6.   Explain how the ultrasonic waves produced with the help of piezoelectric method.[10]

OR

7.   Describe in detail applications of ultrasonic waves   [10]

8.a)   Explain the electronic polarizability in atoms and obtain an expression for electronic polarizability in terms of the radius of the atom.
   b)   The radius of a gaseous atom is 0.062nm. Calculate the electronic polarizability of the gas and its relative permittivity. Given that the number of atoms of the gas is 2.7×10^{25} per m^3.   [8+2]

OR

9.a)   Explain in detail the structure of BaTiO$_3$ and write its applications.
   b)   Derive an expression for ionic polarizability in an ionic solid.   [5+5]

10.a) Explain the origin of magnetic moment and also explain classification of magnetic materials.
    b) Describe Hysteresis behavior of ferromagnetic material.   [5+5]

OR

11.a) Describe the properties of superconductors.
    b) What are important applications of superconductors? Explain in detail.   [4+6]

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