Code No: 132AF **R16**

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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