R16

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

8.a)   What are the important characteristics of ferroelectric materials?
   b)   Derive Clasusius-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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