Subject Code: R10203/R10

Set No - 1

I B. Tech II Semester Supplementary Examinations April/May - 2017
ENGINEERING PHYSICS-II
(Common to All Branches)

Time**:** 3 hours   Max. Marks**:** 75

Answer any **FIVE** Questions
All Questions carry equal marks
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1. (a) Apply Schrodinger's wave equation to a particle in one dimensional box and obtain the eigen values and eigen functions.
    (b) Write short notes on Classical bits and Qu bits.   [10+5]

2. (a) On the basis of classical free electron theory, derive an expression for electrical conductivity.
    (b) Write the expression for Fermi distribution function and explain with suitable diagram, discuss its variation with temperature.   [10+5]

3. (a) Classify solids on the basis of band theory of solids.
    (b) Explain the concept of effective mass of an electron.   [10+5]

4. (a) Explain the domain theory of ferromagnetism. Using that theory, explain the phenomenon of hysteresis in ferromagnetic materials.
    (b) Differentiate a soft magnetic material from a hard magnetic material.   [10+5]

5. (a) What is Meissner effect? Prove that all the superconductors are perfect diamagnets in the superconducting state.
    (b) Briefly explain i) SQUIDS ii) BCS theory.   [7+8]

6. (a) Explain electronic polarization in atoms and obtain an expression for electronic polarizability in terms of the radius of atom.
    (b) Explain dielectric breakdown and loss in dielectric materials.   [10+5]

7. (a) Explain the terms conduction band and valence band of an intrinsic semiconductor with a diagram.
    (b) Derive an expression for density of electrons in conduction band.   [5+10]

8. (a) How do nanomaterials differ from bulk materials? Explain the preparation of nanomaterials by chemical vapour deposition method and describe the important properties of nanomaterials.
    (b) Discuss any five applications of nanomaterials.   [10+5]