Subject Code: R10203/R10

Set No - 1

I B.Tech II Semester Supplementary Examinations Dec./Jan. – 2015/2016
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) Obtain the energy values and normalized wave functions for a particle in a one dimensional infinite potential box of width '*a*'.
    (b) List out the advantages of quantum computation over the classical computation.

    [8+7]

2. (a) Derive expression for electrical conductivity on the basis of classical free electron theory.
    (b) What is Fermi distribution function? Explain with the help of a diagram how it varies with temperature.

    [8+7]

3. (a) Explain the Kronig-Penny model of solids and show that it leads to energy band structure of solids.
    (b) What is meant by effective mass of an electron and derive an expression for it.

    [8+7]

4. (a) Classify magnetic materials on the basis of permanent dipole moment.
    (b) Draw and explain B-H curve for a ferromagnetic material and identify the retentivity and the coercive field on the curve.

    [8+7]

5. (a) Explain Meissner effect and based on this classify the superconductors.
    (b) Discuss any four applications of super conductors.

    [8+7]

6. (a) Explain electronic polarization and show that electronic polarizability is directly proportional to the volume of the atom.
    (b) Explain the frequency dependence of the polarizability of a dielectric material.

    [8+7]

7. (a) Obtain an expression for the carrier density of an intrinsic semiconductor.
    (b) Express conductivity of a semiconductor in terms of forbidden energy gap.

    [8+7]

8. (a) How do the physical and chemical properties of nano-particles vary with their size.
    (b) Write the applications of nanomaterials in various fields.

    [8+7]

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