Code No: R10203 **R10** **SET-1**

I B. Tech II Semester Supplementary Examinations, Nov/Dec - 2017
ENGINEERING PHYSICS-II
(Com. to All Branches)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) Write down the Schrodinger's wave equation for a particle in a box. Solve it to obtain eigen function and show that eigen values are discrete. (10M)
   b) A particle is confined to one dimensional infinite potential well of width 0.2 nm. It is found that when the energy of the particle is 230 eV, its eigen function has 5 antinodes. Find the mass of the particle and show that it can never have energy equal to 1 keV. (5M)

2. a) Discuss the assumptions under classical free electron theory. Deduce a mathematical expression for electrical conductivity on the basis of classical free electron theory. (10M)
   b) Write Fermi-Dirac distribution function. Explain how Fermi function varies with temperature. (5M)

3. Discuss the potential experienced by electron in a perfectly periodic lattice. Explain Kronig-Penney model to assess the behaviour of an electron in a periodic potential. (15M)

4. a) Discuss the origin of magnetism and also the magnetic quantities. (10M)
   b) Explain the different contributions for the formation of domains in a ferromagnetic material. (5M)

5. a) Discuss BCS theory of superconductivity. (10M)
   b) Distinguish between type I and type II superconductors. (5M)

6. a) What is meant by internal field (Local field) in a dielectric material? Derive an expression for it. (10M)
   b) Deduce the Clausius-Mosotti equation. (5M)

7. a) Derive an expression for density of electrons in the conduction band of n type semiconductor. (10M)
   b) Write about direct and indirect band gap semiconductors. (5M)

8. Explain pulsed laser deposition and chemical vapour deposition techniques used to prepare nano phase materials. (15M)
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