Code: **CS 1T3, EC 1T2, EM1T3, IT1T5**

I B.Tech-I Semester-Regular Examinations-February 2013

ENGINEERING PHYSICS

(Common for CSE, ECE, ECM, IT)

Duration: 3hours   Marks: 5x14=70

Answer any FIVE questions.   All questions carry equal marks

1 (a) State and explain Heisenberg's uncertainty principle. (7m)

   (b) Derive Schrödinger's time independent equation.   (7m)

2. (a) Explain the terms (i) Basis (ii) space lattice and (iii) unit
       cell in the description of crystal structure   (6m)

   (b) What are Miller indices? Explain the significance of
       Miller indices. How they are obtained?   (8m)

3. (a) Explain drift velocity and relaxation time of free electrons
       in metals.   (7m)

   (b) Arrive Kronig penney model from Bloch theorem. 7m)

4. (a) Describe different types of polarizations mechanisms in
       dielectrics.   (8m)

   (b) What is piezoelectricity? Give applications of
       piezoelectricity.   (6m)

5. (a) Classify magnetic materials and explain their properties.

(7m)

(b) Explain Superconductivity and Meissner effect. (7m)

6. (a) Derive an expression for the carrier concentration in an extrinsic semiconductor. What would be the position of Fermi level? Explain. (8m)

(b) Describe the drift and diffusion currents in semiconductor.

(6m)

7. (a) With neat diagrams, describe the construction and action of ruby laser. (8m)

(b) What is acceptance angle? Derive an expression for the numerical aperture of an optical fiber. (6m)

8. (a) Discuss some synthesis techniques of nano materials. (8m)
(b) Give some applications of nano materials. (6m)