PVP 14

Code: EE1T3, AE1T3, ME1T3, EC1T3

I B.Tech - I Semester – Regular Examinations – November 2015

ENGINEERING PHYSICS
(Common for EEE, AE, ME, ECE)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11 x 2 = 22 M

1. a) Explain the physical significance of wave function.
   b) Write Schrodinger Time Independent wave equation and explain the terms in it.
   c) What is atomic packing fraction?
   d) What is meant by Fermi –Dirac distribution function and explain?
   e) Define the procedure to find Miller indices of angular plane.
   f) What is a metal? List variety properties of metals.
   g) Explain failure of classical free electron theory.
   h) What is meant by Bhor magneton?
   i) Explain how a nanomaterial different from a bulk material.
   j) Write the different pumping mechanisms.
   k) What is the principle of Optical fibre?

PART – B

Answer any ***THREE*** questions. All questions carry equal marks. 3 x 16 = 48 M

2. a) Write the postulates of Planck's Blackbody theory of radiation. 4 M

b) Find the eigen functions and eigen values for a particle in one dimension Potential well of infinite depth. 9 M

c) The length of the electron confined in an infinite potential well is found to be $3x10^{-4}$ m for the ground state. Calculate the energy of First and second exited state. 3 M

3. a) Write neat-labeled diagram of seven crystal systems and mention lattice Parameters. 4 M

b) Describe the experimental procedure to determine crystal structure in powder method. 9 M

c) Monocromatic X- rays of wavelength 1.5 A.U are incident on a crystal face having an interplanar spacing of 1.6 A.U. Find the highest order for which Bragg's reflection maximum can be seen. 3 M

4. a) Explain Bloch's Theorem. 4 M

b) Give an account of band theory of solids band on Kronig-Penney model. 10 M

c) Find the temperature at which there is 1% probability that state with an Energy 0.5 eV above Fermi energy will be occupied. 2 M

5. a) Discuss different types of Ferro magnetic materials. 4 M

b) Derive Hysteresis curve. Explain hysteresis curve in detail. 8 M

c) The magnetic susceptibility of silicon is 0.5×10^{-5}, what is the intensity of magnetization and magnetic field intensity in a magnetic field of intensity 9.9×10^4 amp/m. 4 M

6. a) Describe Sol- Gel method to synthesis the nano materials. 8 M

b) Explain a brief note on different types of carbon nano tubes. 4 M

c) Write the applications of nano-materials. 4 M