Paper Code: AS-202	**Roll No.**									

B.Tech.
(SEM II) EVEN SEMESTER EXAMINATION 2015-16
ENGINEERING PHYSICS-II

[Time: 2 hrs.] **[Max. Marks: 50]**

Note- ***Attempt All Questions. First question of 14 marks and other three questions of 12 mark each*:-**

Q1. Attempt any **four** parts. [3½ x 4=14]

(a) What do you mean by space lattice and translation vector?
(b) Describe seven crystal systems.
(c) What is coordination number? Describe atom position in body centered cubic lattice.
(d) Determine the interplanar spacing of a lattice plane in a simple cubic lattice with edge 2 A^o which cuts the axes in intercepts ratio 3:4:5.
(e) Describe Lau experiment for X-ray diffraction.
(f) Explain the construction and working of Bragg's spectrometer.

Q2. Attempt any **two** parts. [6 x 2=12]

(a) What do you mean by dielectrics? Describe polar and non polar dielectrics with suitable examples.
(b) Derive the Clausius Mossotti relation. Discuss the physical significance of Clausius Mossotti relation.
(c) What do you understand by magnetic dipole moment? A magnetic material has magnetization of 3000 A/m and flux density 0.005 Weber/m^2. Determine the magnetizing force and the permeability of material.

Q3. Attempt any **two** parts. [6 x 2=12]

(a) Derive Poynting theorem and explain its physical significance.
(b) Write down Maxwells equations in free space and derive wave equations. Also show that speed of EM wave is equal to the speed of light.
(c) What do you understand by skin depth? Calculate the skin depth for the wave of frequency 71.6 MHz in aluminium. The conductivity for aluminiumσ is 3.54×10^7 mho/m and permeability $\mu = 4\pi \times 10^{-7}$ N/amp².

Q4. Attempt any **two** parts. [6 x 2=12]

(a) What is Fermi energy level? Explain the position of Fermi energy level in intrinsic and extrinsic semiconductors.
(b) Explain the temperature dependent of critical field in superconductors. A super conductor material has critical temperature of 4.2 K in zero magnetic fields and a critical field of 0.0306 T at 0 K. Find the critical field at 2.1 K.
(c) What is nano science and nanotechnology? Give some important application of nanotechnology.