II Mid Term Examination

***Odd*-Semester, 2017-18**

Programme: B.Tech I Year **Branch:** All **Year:** First

Subject with Code: Engineering Physics (AHP 1101)

Time: 1 Hour **Max. Marks:** 15

Section A

Note: Attempt all questions. **2X3= 6 Marks**

1. What are the two independent and essential properties of a super conductor? At what temperature is Hc(T)=0.1 Hc(0) for lead (Pb) having Tc=5.0 K?
2. Write the differential form of Maxwell's equation of electromagnetic field based on modified Ampere's law. The magnitude of electric field (E) for plane wave in free space is 376.72V/m, find the magnitude of magnetic field (H).
3. Determine the displacement current density in a material having relative permittivity ε_r=2.0. The electric field in the material is $E=5\times10^{-6}\sin(10^{10}t)$ volt/m ($\varepsilon_0=8.85\times10^{-12}$ c/n-m^2).

Section B

Note: Attempt all questions. **3X3= 9 Marks**

1. Calculate the current produced in a small germanium plate of area 1.0 cm^2 and of thickness 0.5 mm, when a potential difference of 2 volt is applied across the faces. The concentration of free electrons is 2×10^{19} m^{-3} and nobilities of electrons and holes are 0.40 m^2 /v-s and 0.20 m^2 /v-s respectively.
2. Explain Hall Effect. Find the expression for Hall coefficient and give the significance of this measurement.
3. What does Poynting vector signify?
   Show that the electromagnetic waves travel in free space with the speed of light (c). Use the Maxwell's equations.

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