RAMAKRISHNA MISSION VIDYAMANDIRA
(Residential Autonomous College under University of Calcutta)

FIRST YEAR
B.A./B.SC. SECOND SEMESTER (January – June) 2013
Mid-Semester Examination, March 2013

ELECTRONICS (General)

Date : 06/03/2013

Time : 12 noon – 1 pm
Paper : II
Full Marks : 25

1. a) A specimen of metal has $1{\cdot}808\times10^{30}$ free electrons per cubic meter. The mobility of free electrons in the metal is 1 cm^2/V-sec
   i) Calculate the conductivity of metal
   ii) If an electric field of 50V/cm is applied across the specimen, find the drift velocity of free electrons and the current density.

   b) Calculate the conductivity of intrinsic Ge at 300K using—
   $\eta_i = 2{\cdot}4\times10^{19}/m^3$; $\mu_n = 0{\cdot}39m^2/V_s$; $\mu_P = 0{\cdot}19m^2/V_s$. [6+4]

2. a) Explain the V-I characteristics of P-N junction diode.
   b) Derive the Diode current equation with proper explanation. [6+4]

3. Write short notes on **any one** : [1×5]
   a) Fermi Level
   b) Einstein's Relation
   c) Mobility & Current Density of Conductor

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