Week 10 Lecture 25 Quiz:
The BTE with B-fields

ECE 656: Electronic Conduction In Semiconductors
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Purdue University, Fall 2013

Student's name: _____

Answer the **multiple choice questions** below by choosing the **one, best answer**. Then **ask a question** about the lecture.

1) Why is the BTE harder to solve in the presence of a B-field?
   a) Because we are no longer near equilibrium.
   b) Because non-degenerate statistics must be used.
   c) Because the cross product makes the math more difficult.
   d) Because the gradient in momentum space can no longer be approximated by the gradient of f_S.
   e) Because the gradient in position space can no longer be approximated by the gradient of f_S.
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2) In this equation, $\vec{J}_n = \sigma_S \vec{\mathcal{E}} - \sigma_S \mu_H \left(\vec{\mathcal{E}} \times \vec{B} \right)$, what is μ_H ?

   a) The mobility.
   b) The effective mobility.
   c) The conductivity mobility.
   d) The chemical potential.
   e) The Hall mobility.

3) What is the quantity, $\left\langle\!\left\langle \tau_m^2 \right\rangle\!\right\rangle \big/ \left\langle\!\left\langle \tau_m \right\rangle\!\right\rangle^2$, called?

   a) The Hall mobility.
   b) The Hall coefficient.
   c) The Hall factor.
   d) The Hall concentration.
   e) The Hall parameter.

4) What quantity does a Hall effect measurement find?
   a) The Hall mobility.
   b) The mobility.
   c) The Hall concentration.
   d) The carrier concentration.
   e) The Hall resistivity.

5) What does the criterion $\omega_c \tau_m \ll 1$ imply?
   a) Electrons scattering many times before completing a cyclotron orbit.
   b) The magnetic field low.
   c) Shubnikov-deHaas oscillations will not be observed.
   d) All of the above.
   e) None of the above.

6) What question do you have about this lecture?

Turn in to Prof. Lundstrom in class on Wednesday, Oct. 30 .