

ELEG 667-010 - Advanced Nanostructure Devices – Fall 2006
Homework #5 - due Wednesday, 25 October 2006, in class

1. Problem 4.3, in chapter 4, Lundstrom, p. 206 in 2nd edition. Hint: Start from Eq. (4.7) for f_A with (4.32) for the non-degenerate case. Form the ratio of f_A to f_S in terms of the drift and thermal velocities by using an approximate equipartition for the average thermal velocity, and an approximate mobility in terms of τ_f . Discuss this ratio for low and high fields.

2. Problem 4.4, in chapter 4, Lundstrom, p. 206 in 2nd edition. Hint: Consider Eq. (1.46a) and the equation that follows Eq. (3.18).

3. Problem 4.13, in chapter 4, Lundstrom, p. 208 in 2nd edition. Hint: Start from Eq. (4.70b) with $E_j = 0$, and let $\mathbf{B} = B_z \mathbf{z}$.

4. Problem 4.15, in chapter 4, Lundstrom, p. 208 in 2nd edition.

Homework assignments will appear on the web at:

<http://www.ece.udel.edu/~kolodzey/courses/eleg667f06.html>

Note: On each homework and report submission, please give your name, the due date, assignment number and the course number. For full credit - include units/dimensions for all numerical quantities