Physics of Semiconductors and Nanostructrures
ECE 4070 / MSE 6050, Spring Semester 2019
Assignment 7

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Policy on assignments: Please turn them in by 5pm of the due date in the mailbox outside Phillips 426 marked for ECE 4070/ MSE 6050.

The due date for this assignment is **Monday, May 13th, 2019**.

General notes: Present your solutions *neatly*. Do not turn in rough unreadable worksheets - learn to **take pride in your presentation**. Show the relevant steps, so that partial points can be awarded. BOX your final answers. Draw figures wherever necessary. Please print out this question sheet and staple to the top of your homework. Write your name and email address on the cover.

Solve the following exercise problems from the course notes posted on the class website.

Problem 17.1 [The Ballistic Field-Effect Transistor]
Problem 18.1 [Vanishing Act: Tunneling Escape in a Flash Memory]
Problem 19.1 [Boltzmann Transport: Scattering and Mobility]
Problem 23.1 [Electron Mobility in Ultrathin Quantum Wells]
Problem 28.1 [Photonic Processes in Semiconductor Solar Cells]
Problem 29.1 [Population Inversion, Optical Gain, and Lasing]
Problem 29.3 [The Quantum Mechanic]
Problem 29.4 [Tunnel Injection into a Quantum Dot Laser]