Physics 4B
Fall 2022

Name: _____

Lab (circle one): 8:00 am 11:15 am 2:30 pm

# Quiz #5: Current and Resistance

**Problem 1** (2 points)
A current of 0.30 A is passed through a lamp for 2 minutes using a 6.0 V power supply. The energy dissipated by this lamp during the 2 minutes is

a) 1.8 J
b) 3.6 J
c) 20 J
d) 36 J
e) 216 J

**Problem 2** (3 points)
A potential difference V is applied across the ends of a copper wire of area A and length L. For each of the following changes, does the electron drift speed, $v_d$, increase, decrease, or remain the same?

**a)** increasing V, (A and L constant)?

**b)** increasing L, (V and A constant)?

**c)** decreasing A, (V and L constant)?

**Problem 3** (5 points)
A copper wire ($\rho = 1.69 \times 10^{-8}\ \Omega\bullet$m) of cross-sectional area $1.5 \times 10^{-7}$ m$^2$ and length 6.3 m is connected to a 6.0 V power supply. What is **(a)** the current in the wire, **(b)** the magnitude of the current density, **(c)** the magnitude of the electric field in the wire, and **(d)** the rate at which thermal energy is dissipated by the wire?