Name: _____
Physics 4B/Winter 2010
Quiz 9

Make sure to show all work in complete detail. NO CREDIT will be given if no work is shown

1. A long cylindrical conductor of radius R carries a current density J = I/A where I is the current through the conductor and A is the cross-sectional area of the conductor. J is not constant and given by $J = br$ where *b* is a constant and *r* is the radial distance from axis of conductor. Using Ampere's Law find the **B**-field for:
   a) $r < R$
   b) $r > R$
   c) Draw the graph of *B* vs. *r*.

2. Consider the arrangement below. Assume R = 6.00 Ω and, L = 1.20 m, and a uniform B-field of 2.50 T into the page. Calculate the speed of the rod in order to produce a current of 0.50 A in the resistor.