Name:_____

Physics 4B SECOND EXAM Chapters 26 - 27
Spring 1987

Solve the following problems in the space provided. Use the back of the page if needed. Each problem is worth 20 points. You must show your work in a logical fashion starting with the correctly applied physical principles from the back page. Your score will be maximized if your work is easy to follow because partial credit will be awarded.

1. Capacitors $C_1 = 6\mu F$ and $C_2 = 3\mu F$ are charged in series with a 10V battery. The two capacitors are disconnected from the battery and from each other. Then they are connected positive plate to positive plate and negative plate to negative plate. Find the resulting charge on each capacitor.

2. A parallel plate capacitor of capacitance, C_o, is connected to a battery of voltage, V_o, while a dielectric material of dielectric constant, κ, is inserted. Find (a)the original charge on the plates, (b)the original stored energy, (c)the new capacitance, (d)the new potential difference, (e)the new charge, and (f)the new stored energy.

3. A light bulb is rated for 120V and 60W. The filament is 10cm long and has a diameter of 1.0mm. Find the resistance and resistivity of the filament.

4. A 9.0V battery charges a 2500μF capacitor to 90% of its final charge in 75μs. Find (a)the final charge on the plates and (b)the internal resistance of the battery.

5. For the circuit below, find (a)the equivalent resistance, (b)the current provided by the battery, (c)the power provided by the battery, and (d)the current through, voltage across and power used by each resistor.

R_{eq} = I_{batt} = P_{batt} =

V	I	R	P
		6.0Ω	
		12Ω	
		36Ω