Phys 102 – Sec # 42 **Quiz # 9 (Ch. 27)**

Name: Key **ID #**

1- A 4 μ-F capacitor is charged to 24 V. Calculate the charge on the capacitor 4 milli-seconds after it is disconnected from the battery and connected across a 200- Ohm resistor.

3

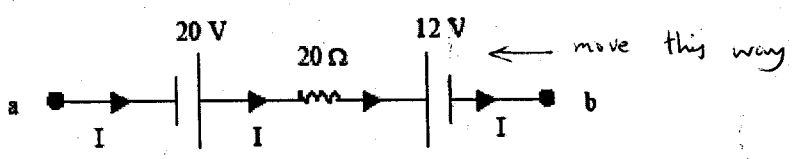
$$q = (C\mathcal{E})\, e^{-t/RC}$$

$$= (4\times10^{-6})(24)\, e^{-\frac{4\times10^{-3}}{(200)(4\times10^{-6})}}$$

$$= \boxed{6.47\times10^{-7}\ C}$$

2- In the figure, if I = 1.5 A in the circuit segment shown, what is the potential difference Vb-Va?

3



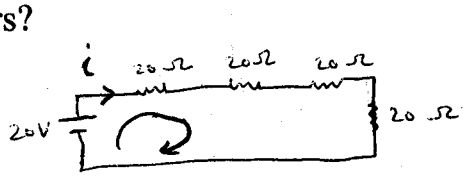
$$V_b + 12 + 20I - 20 = V_a$$

$$V_b - V_a = 8 - 20(1.5) = \boxed{-22\ V}$$

4

3- Four 20-Ohm resistors are connected in **series** and the combination is connected to a 20-V battery.

a) What is the current passing in any of the resistors?



loop rule

$$20 - i(80) = 0$$

$$i = \frac{20}{80} = 0.25\ A$$

the same for all of them.

b) What is the potential difference across any of the resistors?

$$V\ (\text{across any resistor}) = iR = (0.25)(20) = \boxed{5\ V}$$