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first two letters of last name

Physics 7B - Winter 07 - Quiz 9

Name _____ Student ID _____

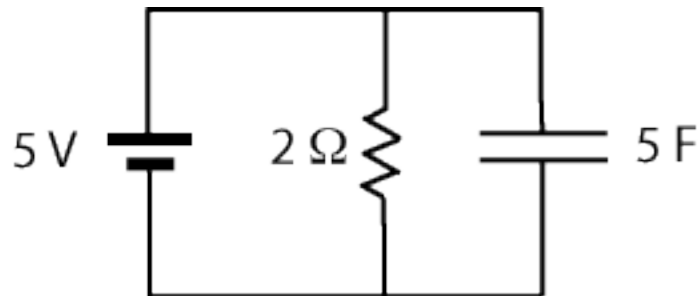
DL section number _____

I certify by my signature that I will abide by the code of academic conduct of the University of California

Signature _____

No books or notes. Calculators OK. Show all of your work below - answers alone do not receive credit!

1. This circuit has a battery, a resistor, and a capacitor.



a) (1.5 pts) What is the voltage across the capacitor, after a long time?

b) (1.0 pts) What is the current in the resistor?

2. (2.0 pts) You take a can of soda from the refrigerator and set it on a table. Initially it has a temperature of $5\ ^\circ\text{C}$. The air temperature is $22\ ^\circ\text{C}$. Draw a graph of the temperature of the soda in the can as a function of time. Make a reasonable guess for the time scale, which you should indicate with tick marks.

PHYS 7B W07 – Quiz 9 Rubric

Question 1a

Correct Answer: After a long time, the capacitor would become fully charged. Thus its voltage will be equal to that of the battery: .

Q (100% of 1.5 = 1.5): Correct answer.

X (0% of 1.5 = 0): Incorrect answer.

Question 1b

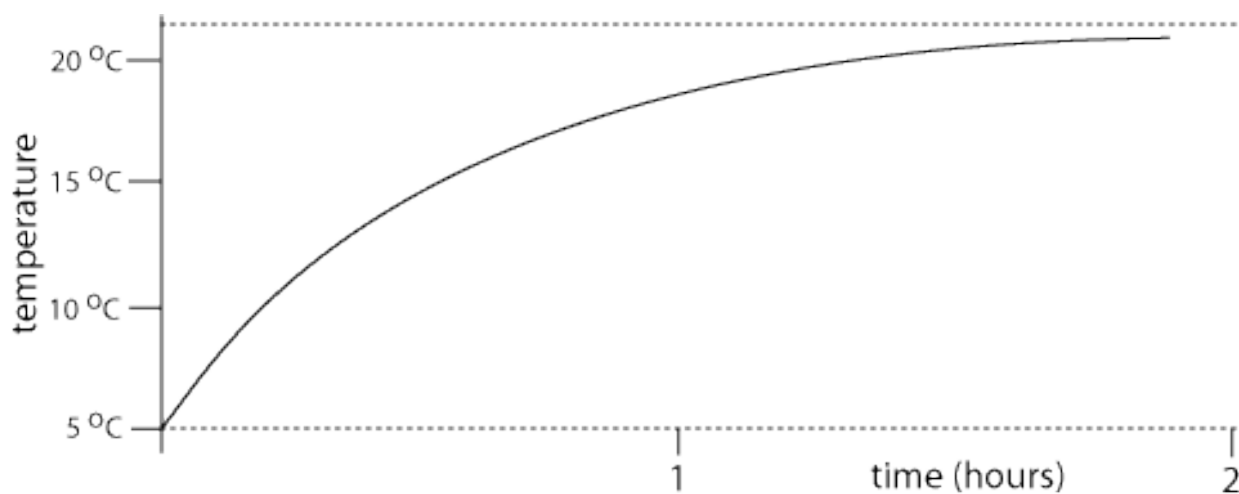
Correct Answer: The voltage drop across the resistor is 5V. Using , we can determine the current to be: .

Q (100% of 1.0 = 1.0): Correct answer.

X (0% of 1.5 = 0): Incorrect answer.

Question 2

Correct Answer: The temperature should have an exponential behavior of the form , where A, B and λ are constants. At $t = 0$ the temperature of the soda is 5°C . After a long time, the temperature of the soda should come into equilibrium with the ambient temperature of 22°C .



Q (100% of 2.0 = 2.0): Correct answer.

R (30% of 2.0 = 0.6): Incorrect answer, but student recognized that the graph would asymptotically approach the ambient temperature.

X (0% of 2.0 = 0): Incorrect answer.