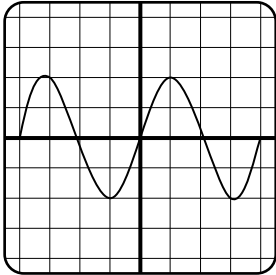


# FORMAL HOMEWORK EXERCISE

## Electricity & Electronics

### Homework - AC & Capacitors

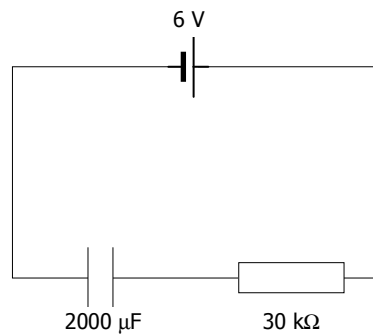
1. The oscilloscope below shows the potential difference over a bulb attached to an AC power supply.



The y-gain is set at 5V / div

The time base is set at 5ms / div

- State the peak potential difference of the trace.
  - Calculate the frequency of the supply.
  - Calculate the rms value of the potential difference.
2. A physics student set up the circuit below.

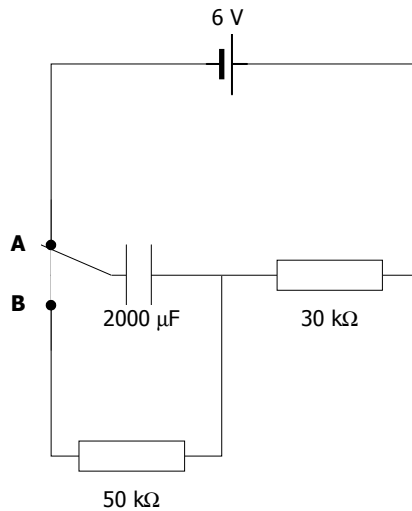


- Calculate the charge stored by the capacitor in this circuit.
- Using this charge, calculate the energy stored by the capacitor.
- The 6 V battery is replaced with a 12 V battery. Calculate the energy stored by the capacitor now.

# FORMAL HOMEWORK EXERCISE

## Electricity & Electronics

3.



The circuit above is set up with the capacitor initially discharged. The switch is put to position A, and the capacitor allowed to fully charge. This process takes 60 seconds

- Calculate the initial charging current in the circuit.
- State the current once the capacitor is fully charged.
- Draw a graph of charging current Vs time. You should have values on both axes.
- What is the potential difference over the capacitor when it is fully charged?

The switch is thrown to position B, and the capacitor is allowed to fully discharge.

- Calculate the initial discharge current.
- How would the discharge time compare to the charge time? Explain your answer.