General Certificate of Education
Advanced Level Examination
June 2011

Physics PHY6T/Q11/task

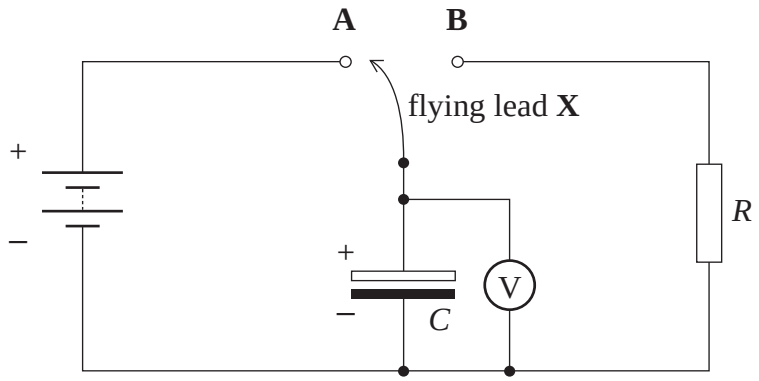
Unit 6 Investigative and Practical Skills in A level Physics
ISA (Q) Capacitor Discharge

Stage 1: Task Sheet

This task is worth 8 marks

You are advised to read through these instructions before beginning your work.

You are going to investigate the discharge of a capacitor through different resistors.



- Set up the circuit as shown in the diagram. You should ensure that the negative terminal of the supply is connected to the negative terminal of the capacitor. If in doubt, ask your supervisor. You will not lose marks for this safety check.
- Connect the resistor with the least resistance in the circuit as R, and record its value.
- Connect the flying lead to point **A** to charge the capacitor. Record the potential difference, V_0 across the capacitor.
- Remove the flying lead from point **A** and connect it to point **B** so that the capacitor discharges through the resistor. Start the stopclock **at the same time** as connecting to point B.
- Take measurements to determine the pd V_{10} across the capacitor after the capacitor has discharged for 10 seconds.
- Change the resistor and repeat the charging and discharging process. Record the resistor value, R, the initial pd, V_0, across the capacitor and the pd, V_{10}, after 10 seconds. Repeat this process with the remaining resistors.
- Record all your measurements and processed data in a suitable table.
- Draw a graph to show how $\ln\left(\frac{V_0}{V_{10}}\right)$ (plotted on the vertical axis) varies with $\frac{1}{R}$.

After the investigation

At the end of the investigation, hand in all your written work, including the graph of $\ln\left(\frac{V_0}{V_{10}}\right)$ against $\frac{1}{R}$, to the supervisor. This documentation will be required for Stage 2 of the ISA.

Ensure that you have entered your centre details, candidate number and name on all the sheets you have completed.