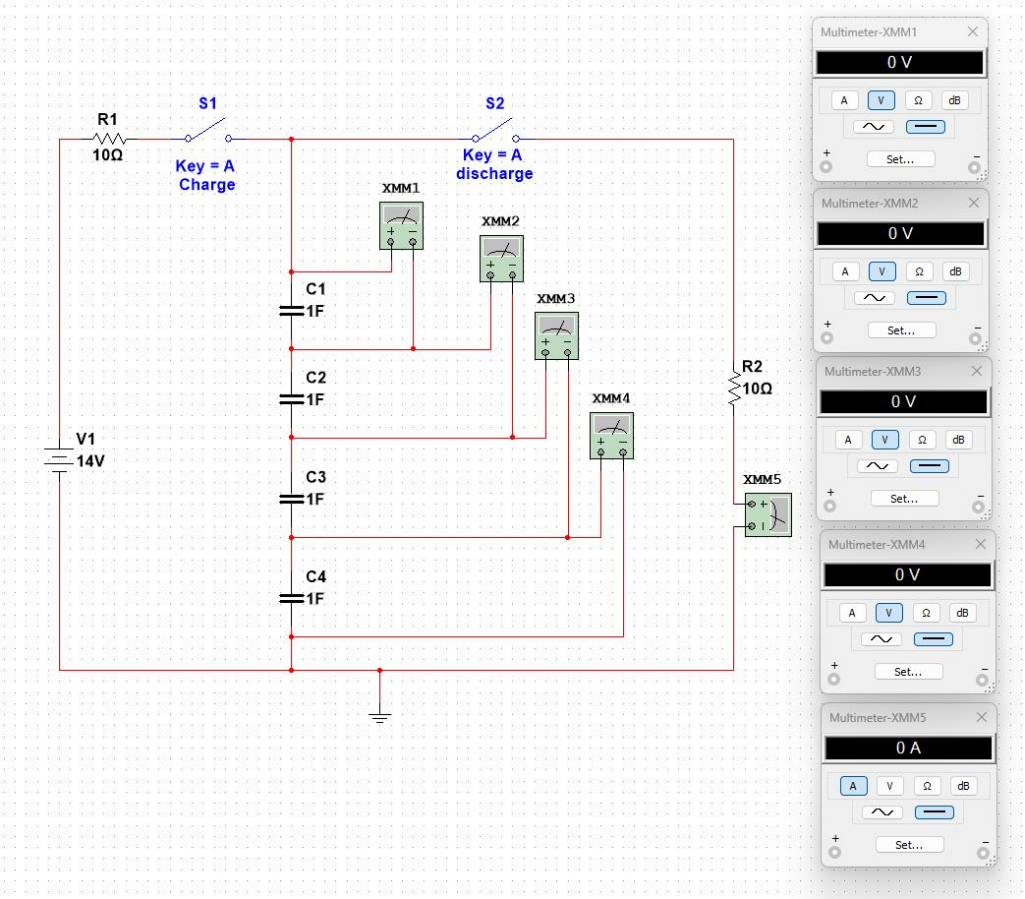

Figure 1: Series capacitors circuit behaving like re-chargeable batteries.

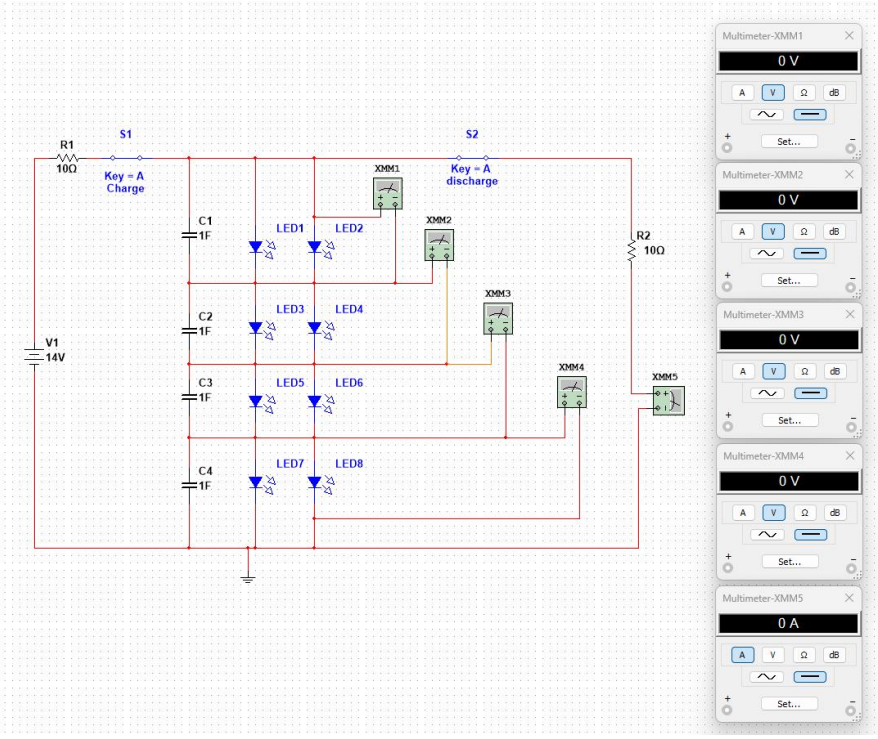

Figure 2: Series Capacitor Circuit with Two identical LEDs in parallel.

Part B - Design and Simulate a Battery Management System

1. Re-design and Simulate the circuit in Figure 1 that offers a more practical solution to the circuit in figure 2, including solving the limitations observed in the circuit in Figure 2 and prevent cell overcharging for a typical Lithium-ion Cell (about 3.5 V).

2. You should also include practical considerations to further improve your proposed design, for example: automatic charging and discharging switches, necessary protections, and charging optimisati:on (**Please note you are not limited to these examples)**.

3. Discuss and explain your proposed design. Include in your discussion the following:
    a) How your proposed design operates and its performance.

    b) Any sustainability, environmental and ethical issues concerned with your proposed design and ways to mitigate them using risk management techniques. You will need to refer to environmental regulations **(don't forget to reference the regulations)**.

    c) Practical limitations and suggest improvements for your proposed design.

(Mark 35%)