



United International University

School of Science and Engineering

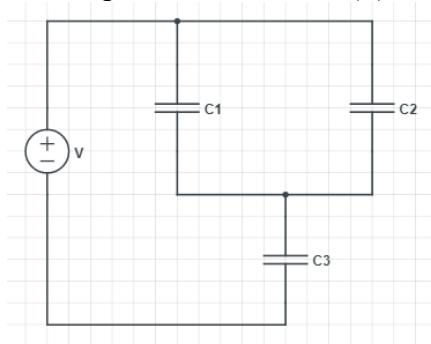
Quiz#05; Year 2021; Semester: Summer

Course: PHY 105; Title: Physics

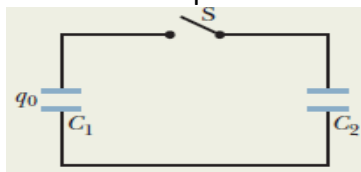
Full Marks: 20; Section: A; Time: 30 minutes

Name:	ID:	Date:
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1. The potential difference applied to the input terminals is $V=14.5$ V. Given, $C_1=10\mu\text{F}$, $C_2=5\mu\text{F}$, $C_3=2.5\mu\text{F}$. Find out (i) the equivalent capacitance C_{123} and (ii) the charge on C_2 . 2

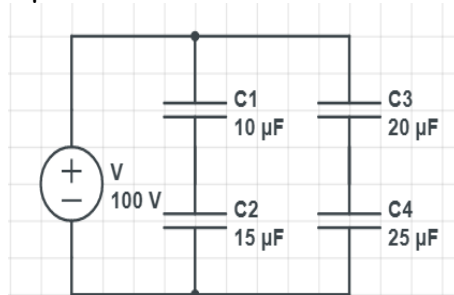


2. Capacitor $C_1=3.55$ mF is charged to a potential difference $V_0=6.30$ mV using a battery. The battery is removed and capacitor is connected as in following figure to an uncharged capacitor C_2 . When switch S is closed, charge flows between the capacitors until they have the same potential difference $V=3.79$ mV. Calculate the capacitance at C_2 . 2



3. An isolated conducting sphere has a capacitance $C=4\pi\epsilon_0 R$ and of diameter $D=15.85$ cm with charge $q=1.25$ fC. (i) How much potential energy is stored in the electric field of the charged conductor? (ii) Find out the energy density at the surface of the sphere. [Given, $\epsilon_0 = 8.85 \times 10^{-12}$ C²/Nm²] 2

4. Determine the equivalent capacitance C_{eq} of the below circuit. Given $V=100$ V, $C_1=10\mu\text{F}$, $C_2=15\mu\text{F}$, $C_3=20\mu\text{F}$, and $C_4=25\mu\text{F}$. 2



5. Suppose you have a 6.0 V battery, a 5.00 μF capacitor, and a 9.40 μF capacitor. (i) Find the charge and (ii) energy stored, if the capacitors are connected to the battery in parallel. 2