



United International University

School of Science and Engineering

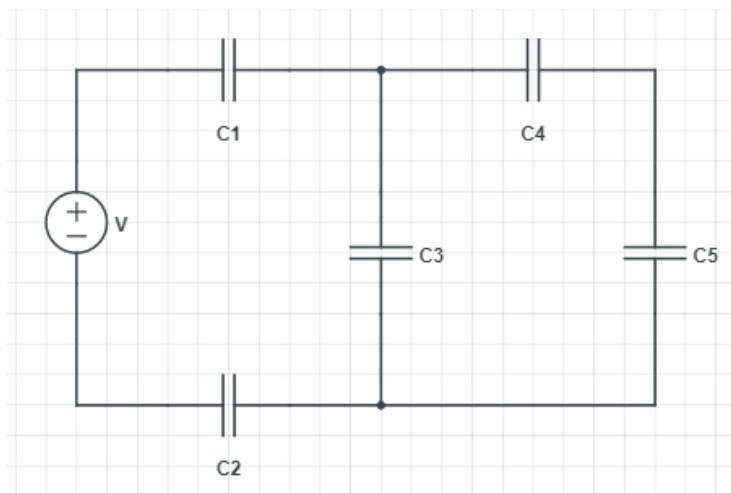
CT Assignment#04; Year 2021; Semester: Spring

Course: PHY 105; Title: Physics

Full Marks: ; Section: B; Time: 30 minutes

Name:	ID:	Date:
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1. In open heart surgery, a much smaller amount of energy will defibrillate the heart. A heart defibrillator delivers certain amount of energy by discharging a capacitor initially at 1.00×10^4 V. If the capacitance of the capacitor is $81 \mu\text{F}$, determine (i) the stored energy by a heart defibrillator and (ii) the amount of stored charge.
2. A circular parallel plate capacitor has diameter 10 cm. Capacitance between parallel plate capacitor is $400 \mu\text{F}$. Calculate the distance between two parallel plate capacitor. [Given, $\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2/\text{Nm}^2$]
3. A storage capacitor on a RAM chip has many excess electrons on its negative plate and the maximum no of electrons are 1.8×10^8 electrons. If the capacitor is charged to 7.3 V, calculate the capacitance involved into the capacitor. [Given, $e^- = 1.6 \times 10^{-19} \text{ C}$]
4. Determine the equivalent capacitance C_{eq} of the below circuit. Given $V=9\text{V}$, $C_1=C_2=24 \text{ pF}$, and $C_3=C_4=C_5=10 \text{ pF}$.



5. Suppose you have a 9.00 V battery, a $5.00 \mu\text{F}$ capacitor, and a $9.40 \mu\text{F}$ capacitor. (i) Find the equivalent charge and (ii) energy stored, if the capacitors are connected to the battery in series.