



UNIVERSIDAD DE SAN CARLOS DE GUATEMALA
FACULTAD DE INGENIERÍA
ESCUELA DE CIENCIAS
DEPARTAMENTO DE FÍSICA

F2 B	Nota:
DIC.2022	
AUX. CESAR FERNANDEZ	

TAREA
HOJA DE TRABAJO
EXAMEN CORTO

☐

No.

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6

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HT6.

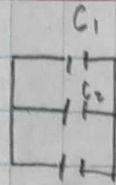
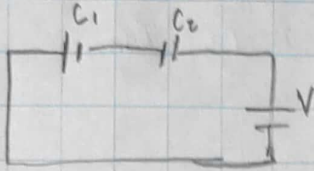
Problema 1.

$$C = C_p$$

$$C = C_s$$

$$C_1 + C_2 = C_p$$

$$\frac{C_1 C_2}{C_1 + C_2} = C_s$$



$$\frac{C_1 C_2}{C_p} = C_s \Rightarrow C_s C_p = C_1 C_2$$

$$C_2 = \frac{C_s C_p}{C_1}$$

$$C_1 + \frac{C_s C_p}{C_1} = C_p \Rightarrow C_p = \frac{C_1^2 + C_s C_p}{C_1}$$

$$C_p C_1 = C_1^2 + C_s C_p$$

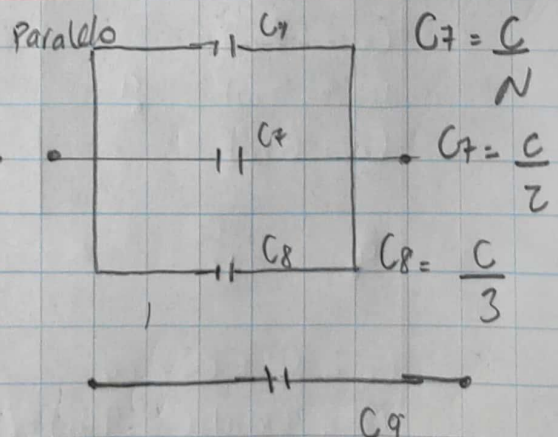
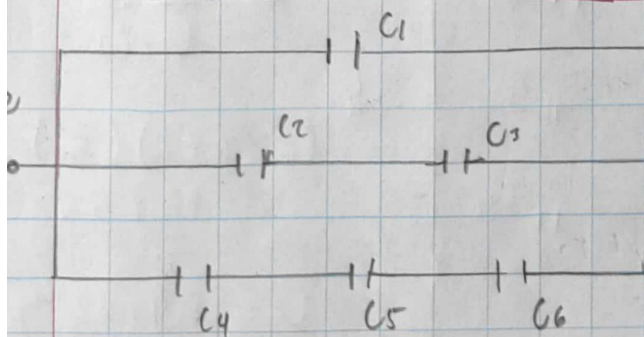
$$C_1^2 - C_p C_1 + C_s C_p = 0$$

$$C_1 = \frac{-(-C_p) \pm \sqrt{(-C_p)^2 - 4(1)(C_s C_p)}}{2} = \frac{C_p \pm \sqrt{C_p^2 - 4C_s C_p}}{2}$$

$$C_1 = \frac{C_p \pm \sqrt{C_p^2 - 4C_s C_p}}{2}$$

$$C_2 = \frac{C_s C_p}{C_1}$$

Problema 2.



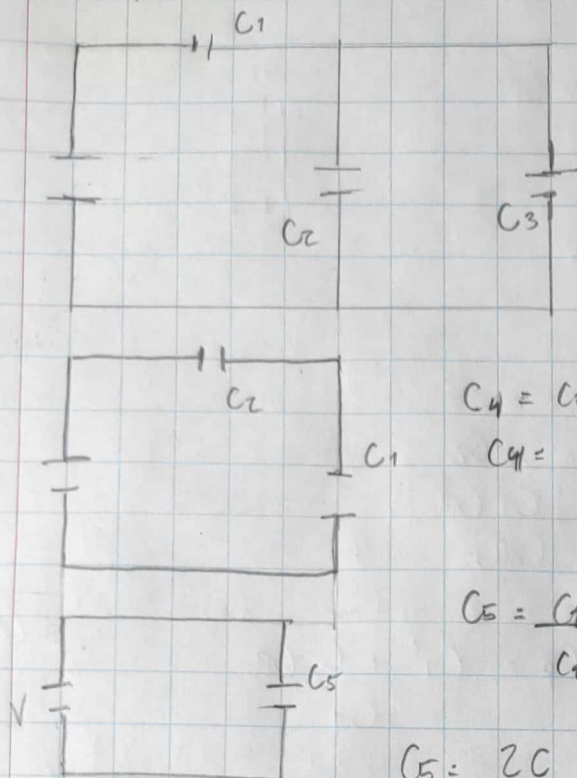
$$C_{eq} = C + \frac{C}{2} + \frac{C}{3} = C \left(1 + \frac{1}{2} + \frac{1}{3} \right)$$

$$C_{eq} = C \left(\frac{11}{6} \right) = 1.83 C$$

$$C_{eq} = C_7 + C_7 + C_8$$

$$C_{eq} = 1.83 C$$

Problema 3



$$C_1 = 3C$$

$$C_2 = C$$

$$C_3 = 5C$$

$$C_4 = C_2 + C_3 = C + 5C$$

$$C_4 = 6C$$

$$C_5 = \frac{C_1 C_4}{C_1 + C_4} = \frac{(3C)(6C)}{3C + 6C} = \frac{18C^2}{9C} = 2C$$

$$C_5 = 2C$$

$$Q_5 = 2CV$$

$$C = \frac{Q}{V} \Rightarrow Q = CV$$

$$Q_5 = Q_1 = Q_4 = 2CV$$

$$V_2 = \frac{2CV}{3C} = \frac{2}{3}V$$

$$V_4 = \frac{2CV}{6C} = \frac{V}{3}$$

$$V_4 = V_2 = V_3 = \frac{V}{3}$$

$$Q_2 = \frac{CV}{3} = \frac{1}{3}CV \quad Q_3 = \frac{5CV}{3} = \frac{5}{3}CV$$

$$a) C_{eq} = C_5 = 2C$$

$$b) Q_1 > Q_3 > Q_2$$

$$c) V_1 > V_2 \neq V_3$$

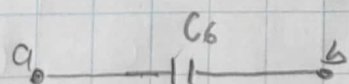
Problema 4

$$C_1 = 4 \mu F$$

$$C_2 = 7 \mu F$$

$$C_3 = 5 \mu F$$

$$C_4 = 6 \mu F$$



$$C_5 = \frac{C_2 C_3}{C_2 + C_3}$$

$$C_5 = \frac{(7 \mu)(5 \mu)}{7 \mu + 5 \mu}$$

$$C_5 = 2.91 \times 10^{-6} F$$

$$C_6 = C_1 + C_5 + C_4$$

$$C_6 = (4 \mu) + (2.9 \mu) + (6 \mu)$$

$$C_6 = 1.29 \times 10^{-5} F$$

$$C_{eq} = 12.9 \mu F$$