	UNIVERSIDAD DE SAN CARLOS DE GUATEMALA	FÍSICA 2 C	NOTA:
	FACULTAD DE INGENIERÍA		
	ESCUELA DE CIENCIAS	1S2023	
	DEPARTAMENTO DE FÍSICA		
	INGA. CLAUDIA CECILIA CONTRERAS FOLGAR DE ALFARO	AUX. ANGEL QUIM	

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HT 6

HT6

P.1

$$R = 20 \Omega$$

$$t = 10 \text{ min.}$$

$$\Delta V = 30 \text{ V.}$$

$$\Delta V = IR$$

$$I = \frac{\Delta V}{R} = \frac{30}{20} = 1.5 \text{ A.}$$

$$I = \frac{\Delta Q}{\Delta t}$$

$$\Delta Q = I \Delta t = (1.5)(600)$$

$$\Delta Q = 900 \text{ C.}$$

$$\#e = \frac{\Delta Q}{e} = \frac{900}{1.6 \times 10^{-19}} = 5.625 \times 10^{21} e^-$$

$$\#e = 5.6 \times 10^{21} e^-$$

P.2

$$L = 2 \text{ m}$$

$$\phi = 1 \times 10^{-3} \text{ m}$$

$$R = 0.45 \Omega$$

$$R = \frac{\rho L}{A} \Rightarrow \frac{AR}{L} = \rho$$

$$\rho = \frac{(1 \times 10^{-3}/2)^2 \pi}{2} (0.45) = 1.7671 \times 10^{-7} \Omega \text{ m.}$$

$$\rho = 1.8 \times 10^{-7} \Omega \text{ m.}$$

P.3

$$n = 8.49 \times 10^{28} \text{ e/m}^3$$

$$I = 1.00 \text{ A}$$

$$A = 0.40 \text{ cm}^2$$

$$I = n q v_d A$$

$$v_d = \frac{I}{n e A} = \frac{1}{(8.49 \times 10^{28})(1.6 \times 10^{-19})(4 \times 10^{-5})}$$

$$v_d = 1.84 \times 10^{-6} \text{ m/s} \Rightarrow v_d = -1.84 \times 10^{-6} \text{ m/s}$$

$$v_d = -1.84 \times 10^{-6} \text{ m/s}$$

P.4

$$P = 7.5 \text{ W}$$

$$\Delta V = 125 \text{ V.}$$

$$\alpha = 4.5 \times 10^{-3}$$

$$T = 7T_0 = 7(20^\circ \text{C})$$

$$R_{op} = \frac{\Delta V}{I} = 2083.33 \Omega$$

$$R_{op} = R_0 [1 + \alpha (T_{op} - T_0)]$$

$$R_0 = 1352 \Omega$$

$$R_0 = \frac{2083.33}{(1 + 4.5 \times 10^{-3} (140 - 20))} = 1352 \Omega$$

P.5

$$R = \frac{\rho l}{\pi r^2}$$

$$m_1 = m_2$$

$$\rho V_1 = \rho V_2$$

$$\pi r_1^2 l = A_2 \frac{l}{4}$$

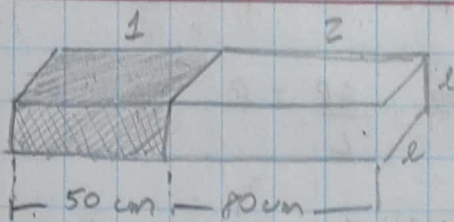
$$A_2 = 4\pi r^2$$

$$R_2 = \frac{\rho l / 4}{4\pi r^2} = \frac{\rho l}{16\pi r^2}$$

$$R_2 = \frac{R}{16}$$

$$R_2 = \frac{R}{16}$$

P.6



$$l = 4 \text{ mm}$$

$$\rho_1 = 4 \times 10^{-8} \Omega \cdot \text{m}$$

$$\rho_2 = 6 \times 10^{-8} \Omega \cdot \text{m}$$

$$R_1 = \frac{\rho_1 l}{A} = \frac{(4 \times 10^{-8})(0.5)}{(4 \times 10^{-3})^2} = 1.25 \times 10^{-3} \Omega$$

$$R_2 = \frac{\rho_2 l}{A} = \frac{(6 \times 10^{-8})(0.8)}{(4 \times 10^{-3})^2} = 3 \times 10^{-3} \Omega$$

$$R_T = (1.25 + 3) \times 10^{-3} = 4.25 \times 10^{-3} \Omega$$

$$R_T = 4.25 \text{ m}\Omega$$

P.7

$$\Delta V = 9 \text{ V}$$

$$I = \frac{\Delta V}{R}$$

$$\rho_1 = 4 \times 10^{-8} \Omega \cdot \text{m}$$

$$\rho_2 = 6 \times 10^{-8} \Omega \cdot \text{m}$$

$$R_T = 4.25 \times 10^{-3} \Omega$$

$$I = \frac{9}{4.25 \times 10^{-3}} = 2117.6 \text{ A}$$

$$I = 2118 \text{ A}$$