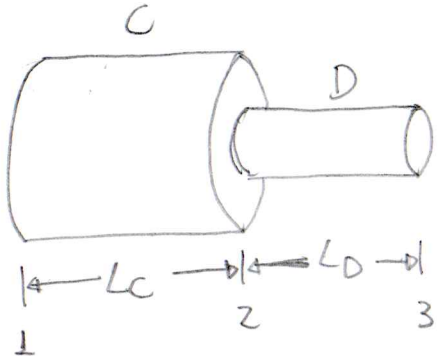
Cap 26 - Ex 53



$L_C = L_D = 1{,}0\ m$

$\rho_C = 2 \times 10^{-6}\ \Omega \cdot m$

$d_C = 1{,}0\ mm$

$\rho_D = 1 \times 10^{-6}\ \Omega \cdot m$

$d_D = 0{,}5\ mm$

$i = 2\ A$

a) V entre 1 e 2

b) V " 2 e 3

c) P " 1 e 2

d) P " 2 e 3

a) A diferença de potencial V pode ser calculada por

$$\boxed{V = R \cdot i}$$

$$\therefore V_C = R_C \cdot i$$

$$R_C = \rho_C \cdot \frac{L_C}{A_C} = \rho_C \frac{L_C}{\pi r_C^2}$$

$$R_C = 2 \times 10^{-6}\ \Omega \cdot m \cdot \frac{1{,}0\ m}{\pi (0{,}0005\ m)^2}$$

$$R_C = 2{,}546\ \Omega$$

$$V_C = 2{,}546 \cdot \Omega \cdot 2 \cdot A$$

$$V_C \cong 5{,}093\ V.$$

b) $V_D = R_D \cdot i$

$$R_D = \rho_D \cdot \frac{L_D}{\pi r_D^2} = \frac{1 \times 10^{-6} \cdot 1}{\pi (0{,}00025)^2}$$

$$R_D = 5{,}093\ \Omega$$

$$V_D = 5{,}09 \times 2 \cong 10{,}2\ V$$

c) $P = iV = i^2 R = \frac{V^2}{R}$

$$P_C = 2 \cdot 5{,}093 \cong 10{,}2\ W$$

d) $P_D = 2 \cdot 10{,}2 \cong 20{,}4\ W$