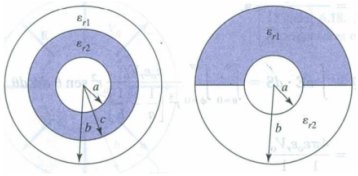
1-



$$C = \frac{4\pi\epsilon}{\frac{1}{r_a} - \frac{1}{r_b}} \qquad r_a < r_b$$

**(a)** (3pts.) Determine la capacitancia del capacitor. Sea $a = 10mm, b = 30mm, c = 20mm, \varepsilon_{r1} = 2.5\ y\ \varepsilon_{r2} = 3.5$.

$$C_1 = \frac{4\pi \cdot 3{,}5}{\frac{1}{10mm} - \frac{1}{20mm}}$$

Estan en serie

$$C_{Tot} = \left[\frac{1}{C_1} + \frac{1}{C_2}\right]^{-1}$$

$$C_1 = 0{,}88\ F$$

$$C_2 = \frac{4\pi \cdot 2{,}5}{\frac{1}{20mm} - \frac{1}{30mm}}$$

$$C_{tot} = \left[\frac{1}{0{,}88} + \frac{1}{1{,}88}\right]^{-1}$$

$$C_2 = 1{,}88\ F$$

$$\boxed{C_{tot} = 0{,}6\ F}\ R/$$

**(b)** (3pts.) Si los cascarones esféricos con radios $a = 10mm, b = 30mm$ se mantienen en una diferencia de potencial de 100 V, de modo que $V(r = b) = 0 y\ V\ (r = a) = 150V$. Determine la carga total inducida en los cascarones.

Estan en paralelo

$$C = \frac{2\pi\epsilon_0}{\frac{1}{a} - \frac{1}{b}} \qquad C_{tot} = C_1 + C_2$$

$$C_1 = \frac{2\pi \cdot 2{,}5}{\frac{1}{10mm} - \frac{1}{30mm}} = 0{,}24\ F \qquad C_2 = \frac{2\pi \cdot 3{,}5}{\frac{1}{10mm} - \frac{1}{30mm}} = 0{,}33\ F$$

$$C_{Tot} = 0{,}24 + 0{,}33 = 0{,}57\ F$$

$$Q = C \cdot V \qquad V_{ab} = 100V \Rightarrow \qquad Q = 0{,}57 \cdot 100 \qquad \boxed{Q = 57\ C}\ R/$$