

31.7

Datos

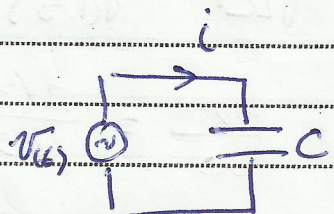
$$V_{\max} = 170 \text{ V}$$

$$f = 60 \text{ Hz}$$

$$I_{\max} = 0.85 \text{ A}$$

C = ?

$$\text{Si } v(t) = V_{\max} \sin \omega t$$



Aplicando la ley de Kirchhoff

$$V_{\max} \sin \omega t = \frac{q}{C}$$

$$C V_{\max} \sin \omega t = q$$

la corriente es $i = \frac{dq}{dt}$; derivando la ecuación de q

$$\frac{dq}{dt} = C \omega V_{\max} \cos \omega t, \text{ donde } i_{\max} = C \omega V_{\max}$$

$$\text{Por lo que } C = \frac{i_{\max}}{\omega V_{\max}} = \frac{i_{\max}}{2\pi f V_{\max}} = \frac{0.85}{2(3.14)(60)(170)}$$

$$C = 13.3 \mu\text{F}$$