Solution

1. $Av = \frac{R}{R+1/jC\omega}$ $\quad$ $Av = \frac{jRC\omega}{1+jRC\omega}$

2. D'après la fonction de transfert, on a un filtre passe haut du 1er ordre.

3. $Av = \frac{jRC\omega}{1+jRC\omega} = \frac{j\omega/\omega_0}{1+j\omega/\omega_0}$ $\quad$ $Gm = 1$

   $\omega_0 = 1/RC = 2\pi fc$ $\quad$ $fc = 1/2\pi RC$

4. $C = 1/2\pi Rfc = 1/2\pi\ (627.10^3 \times 6,8.10^3)$ $\quad$ $C = 37,33pF$

   $$|Av| = \frac{Us}{Ue} = \frac{\frac{\omega}{\omega_0}}{\sqrt{1+\left(\frac{\omega}{\omega_0}\right)^2}} \qquad \omega / \omega_0 = 2\pi f\ / 2\pi fc = f / fc$$

5. Gain $|Av| = \frac{Us}{Ue} = \frac{\frac{f}{fc}}{\sqrt{1+\left(\frac{f}{fc}\right)^2}}$

   Pour $f = fc$, $\frac{Us}{Ue} = \frac{1}{\sqrt{1+\left(\frac{f}{fc}\right)^2}} = \frac{1}{\sqrt{1+(1)^2}} = \frac{1}{\sqrt{2}}$

   $Us = \frac{Ue}{\sqrt{2}} = \frac{2}{\sqrt{2}}$ $\quad$ $Us = 1,4\ V$