Also from (*) it follows:

$$\left[R + i\left(\Omega L - \frac{1}{\Omega C}\right)\right] \frac{I_0}{V_0} = \cos\varphi + i\sin\varphi \Rightarrow$$

$$\boxed{\tan\varphi = \frac{\Omega L - \frac{1}{\Omega C}}{R}}$$

(b) The circuit is at resonance, when a maximum of the amplitude appears. From our formula for $I_0(t)$ we see, that this takes place, when the denominator has a minimum at

$$\left(\Omega L - \frac{1}{\Omega C}\right) = 0 \Rightarrow \Omega^2 = \frac{1}{LC} \Rightarrow \boxed{\Omega_{res} = \frac{1}{\sqrt{LC}}}$$