Indian Institute of Technology Bombay

Dept of Electrical Engineering

Handout 8 **EE 101 Electrical & Electronic Circuits**

Tutorial 6 Aug 26, 2011

Question 1) Let an input of $V(t) = 240\sin(\omega_0 t + \frac{\pi}{4})\,Volts$ is applied as input to the circuit below. At what value of ω_0 will the voltage sinusoid $v_R(t)$ achieve the minimal amplitude. (Recall that amplitude of a sine wave is the maximal level it can take, i.e. α in $\alpha\sin(\omega t)$)

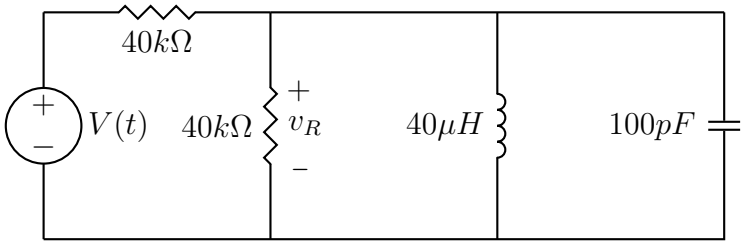

Figure 1

Can you justify the term ***resonant frequency****, for the ω_0 you found in the question above.*

Question 2) Find the voltage across the inductor if $V(t) = e^{-5t}\cos(4t - 30^{\text{deg}})u(t)\,Volts$.

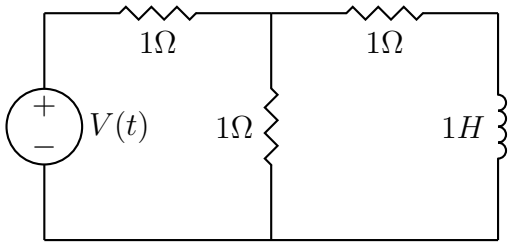

Figure 2

Question 3) If $V(t) = 10\cos(2t - \frac{\pi}{3})$, find the Thevenin equivalent between A and B.

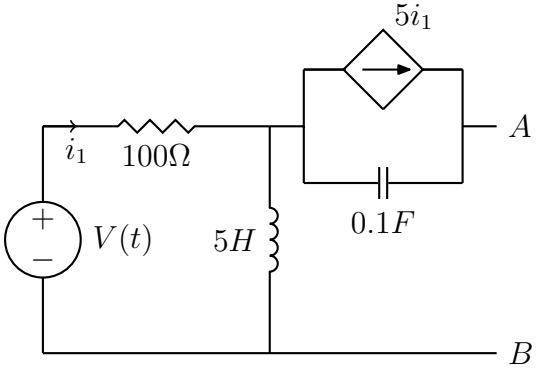

Figure 3

Question 4) In Figure 4, let $V(t) = 24\sqrt{2}\cos(2t)\,Volts$. Find the voltage across terminals A and B.

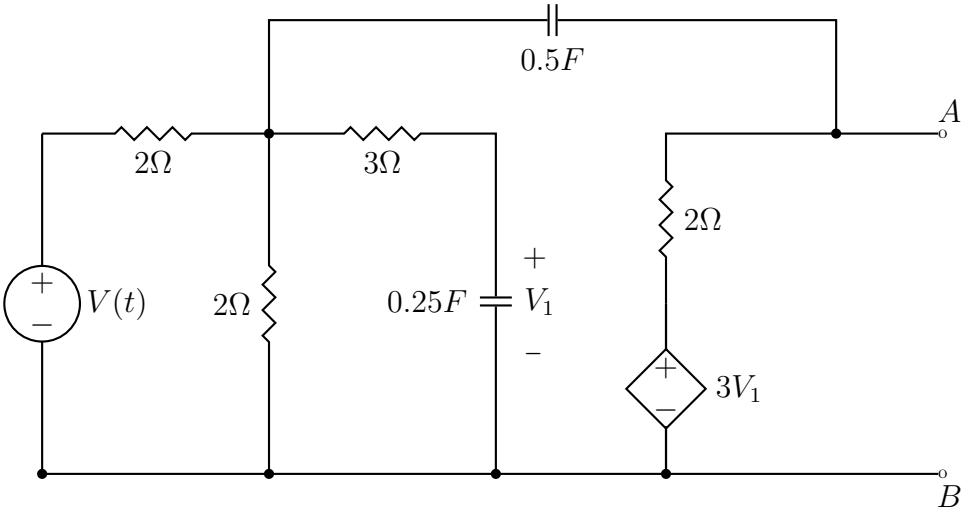

Figure 4

Question 5) If $V_1(t) = \cos 4t$ and $V_2(t) = 2\sin 8t$, find the current through the capacitor.

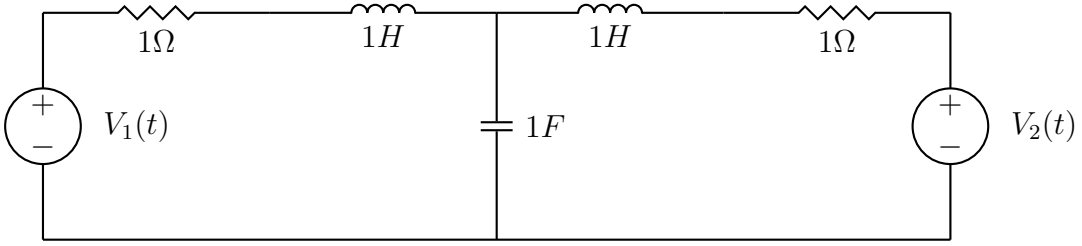

Figure 5