Question 1 [4]
A sinusoidal voltage is zero at $t = -\frac{2\pi}{3}ms$ and increasing at a rate of $80000\frac{V}{s}$. The maximum amplitude of the voltage is 80V.

(a) What is the frequency of v in radians per second?

(b) What is the expression for $v(t)$?

Question 2 [4]
A $50kHz$ sinusoidal voltage has zero phase angle and a maximum amplitude of $10mV$. When this voltage is applied across the terminals of a capacitor, the resulting stead-state current has a maximum amplitude of $628.32\mu A$.

(a) What is the frequency of the current in radians per second?

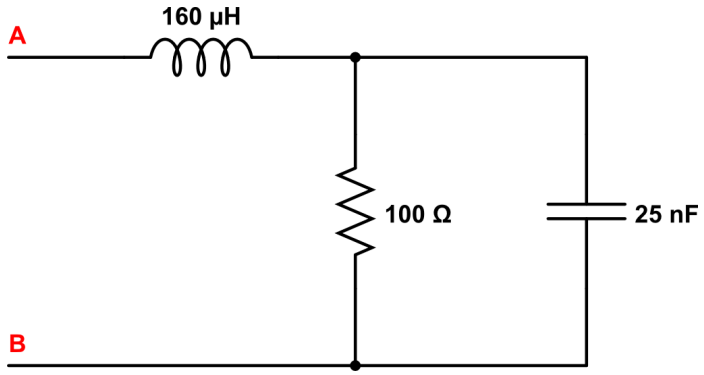
(b) What is the phase angle of the current?

(c) What is the capacitive reactance of the capacitor?

(d) What is the capacitance of the capacitor?

(e) What is the impedance of the capacitor?

Question 3 [4]
For the circuit shown below:

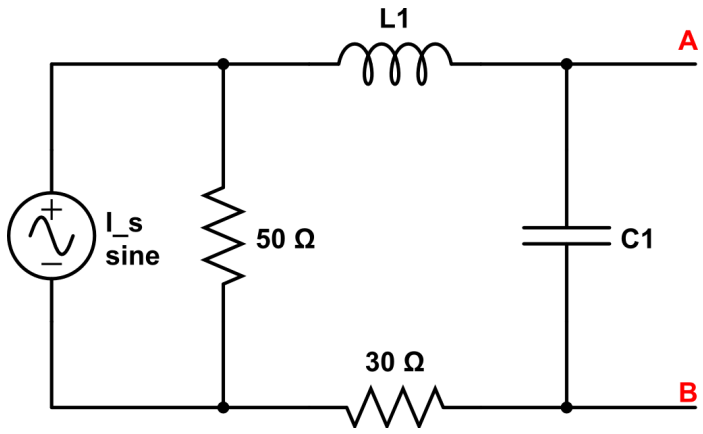


(a) Find the frequency (in radians per second) at which the impedance Z_{ab} is purely resistive.

(b) Find the value for Z_{ab} at the frequency found in (a).

Question 4 [4]

Use source transformation to find the Norton equivalent circuit with respect to the terminals a and b for the below circuit when $I_s = 4\angle 0° A$, $L_1 = j60\Omega$, and $C_1 = -j100\Omega$:



Question 5 [4]

Us the node-voltage method to find the steady-state expression for $v_0(t)$ in the circuit below if

$$v_{g1} = 25\sin(400t + 143.15°)V \tag{1}$$

$$v_{g2} = 18.03\cos(400t + 33.69°)V \tag{2}$$