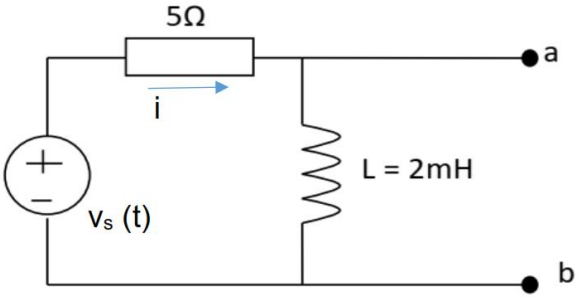
PRINCIPLES OF EE1

HW

Deadline: 8:00, 8 JUNE 2024

INSTRUCTIONS: Students scan and upload answer into Blackboard

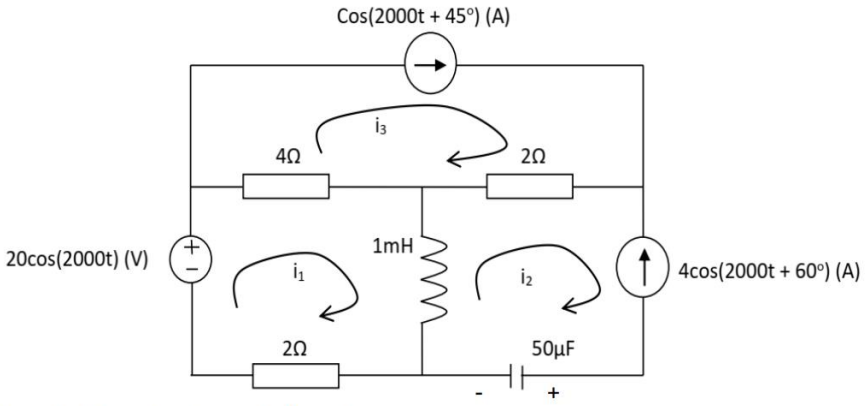
Question 1



The electric circuit is depicted in the figure with $v_s(t) = 20\cos(5000t)$ V

a. Show all the values of circuit elements in phasors.
b. Calculate i(t).
c. Compute and draw the Thevenin equivalent circuit in phasor for terminals a and b.
d. If a capacitor of 100μF is connected to terminal a and b, determine the voltage across the capacitor in time domain.

Question 2



The electric circuit is shown in the figure

a. Show the circuit in phasors.
b. Establish the mesh-current equations in phasor.
c. Determine I_1 in phasor and $i_1(t)$.
d. Determine voltage across the capacitor in frequency and time domains.

Question 3

The electric circuit is described below with four circuit elements and one current source sin(t) (A) with the voltage polarity given.

a. Use source transformation method to determine voltage across 1 Ω resistor in phasor and time domain.

b. What is the average power dissipated in 1 Ω.

c. What is the complex power S of the current source (sint) in the circuit.