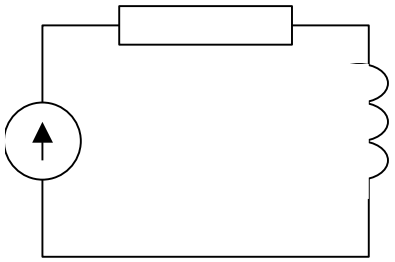
CSU11031

Problem Sheet 4

Q1
Calculate the voltage across each the resistor and the inductor in the following circuit where:

$$i(t) = 5 \text{ Sin } (1000\pi t + \pi/3)$$

R = 100 Ohms



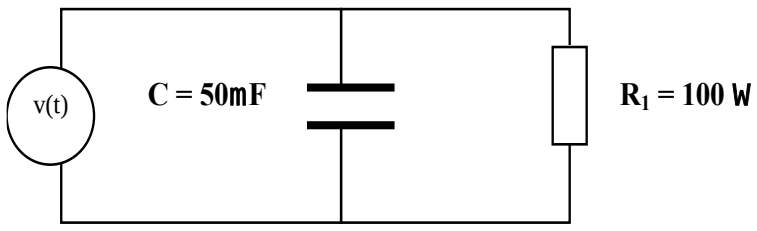
L = 10 mH

What is the total voltage across the load?
What is the total voltage at time t = 0.02 s?
What is the frequency of the applied current?

500 Sin (1000πt + π/3) + 50π Cos (1000πt + π/3)V, Substitute t=0.02s into general expression, 500Hz

Q2
Calculate the current in each branch of the following circuit where:

$$v(t) = 20 \text{ Cos } (1000\pi t + \pi/4)$$



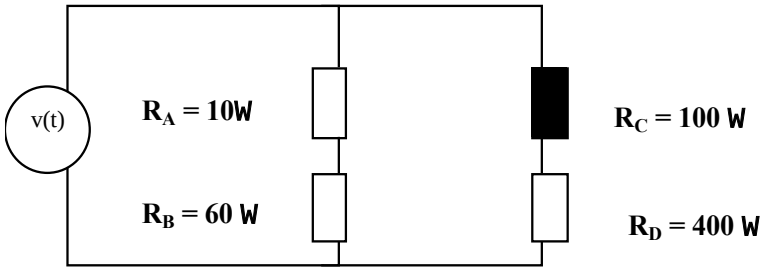
What is the total current in the circuit?

Capacitor: -1000πSin(1000πt + π/4)A, Resistor: 0.2Cos(1000πt + π/4)A

Q3.

Calculate the voltage across R_C in the following circuit? Calculate the current in each branch.

$$v(t) = 10 \text{ Cos } (500\pi t + \pi/6)$$



2Cos(500 πt + π/6)V, 0.14 Cos (500πt + π/6)A, 0.02 Cos (500πt + π/6)A