CSU11031 Electronics Assignment 2

1. Connect up the circuit below using Multisim placing the voltmeter and ammeters at the locations shown. The supply voltage is:

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

(i) Run the simulation. What do you observe? Please provide a superimposed plot of the voltages and currents using Grapher.

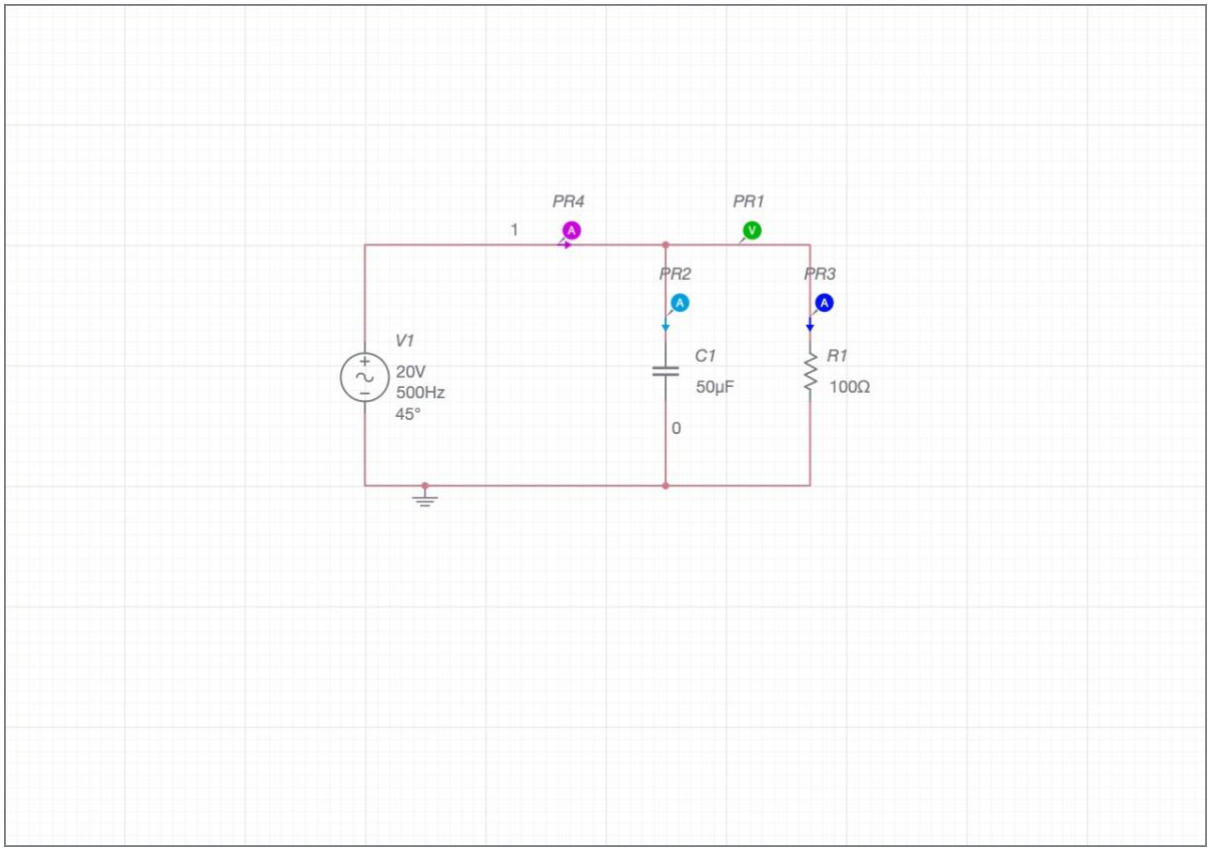
[10 Marks]

(ii) Calculate the current through the capacitor. Verify your result with the reading from the plot. Why is the supply voltage 90 degrees out of phase with the capacitor current?

[20 Marks]

(iii) Calculate the total current drawn from the source. Compare with the result given by the simulator.

[10 Marks]



2. Connect up online the circuit below using Multisim:

Place voltmeters and an ammeter at the locations indicated. The supply current is:

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

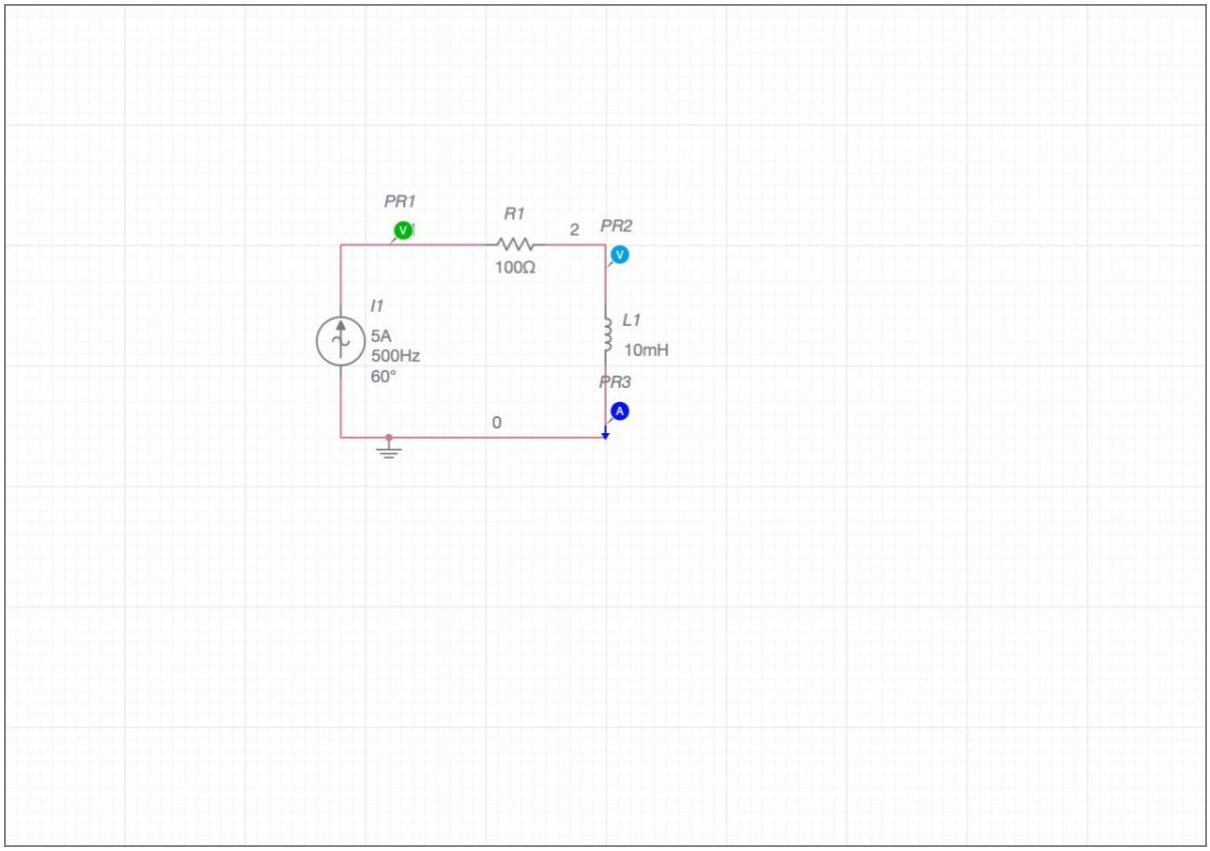
Run the simulation.

(i) Calculate the voltage across the inductor. Verify your result by observing this voltage on Grapher. Why is the inductor voltage out of phase by approximately 90 degrees with the load (or supply) voltage?

[25 Marks]

(ii) Calculate the total voltage across the load (resistor-inductor combination). Verify (approximately) your result by observing this voltage on Grapher.

[15 Marks]



Note: Your report should be typewritten and contain all of the circuits you implemented and associated calculations and explanations. The header page should state the title (CSU11031 Electronics Assignment 2), your name and your student number. You should note that most of the marks go for the explanation of your observations. 20 Marks go for presentation. Your report will be downgraded if it does not meet a minimum acceptable standard.