Homework 2

Due in **19/04/2024 17:00**

Instructions for Homework: DO NOT LEAVE YOUR ANSWER AS A FRACTION (E.g. 13/2 IS NOT OK, BUT 6.5 IS OK!)

1) Solve the following problems by hand on an A4 size paper, clearly explain your results. Draw a box for the numeric value you found for the answer. It is your responsibility to show a clearly written and step by step solutions for the homework questions. If the TA cannot read your answer, you will NOT get any point for that question. *It is your responsibility to check your answers multiple times before submitting the homework.*

2) Scan your answers into PDF with a file name as "StudentName_LastName_StudentID.pdf". It is your responsibility to make sure the scanned documents readibility is clear. You will not get any points for blurry or low quality answers

3) Upload your answer into **Esuzem HW2 section before the deadline.** If you reach the max file size for Esuzem, upload a document with an active google drive link as a PDF and public access. If the TA cannot download your PDF, you will get a zero point for the homework.

Submit your solutions for the questions below from our text book (7th Ed Allan Hambley, Electrical Engineering Principles)

Q1)

***P3.51.** A constant voltage of 20 V is applied to a 10-μH inductance, as shown in Figure P3.51. The current in the inductance at $t = 0$ is -200 mA. At what time t_x does the current reach +200 mA?

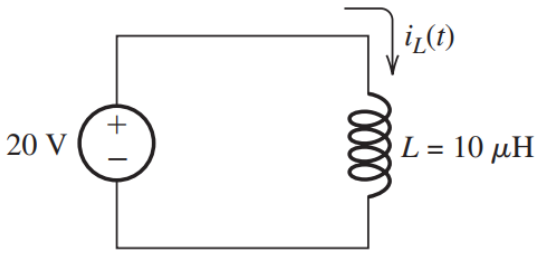


Figure P3.51

Q2)

P3.12. Determine the capacitor voltage, power, and stored energy at $t = 10$ ms in the circuit of Figure P3.12.

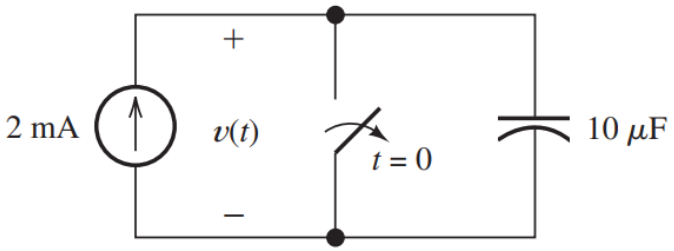


Figure P3.12

Q3)

***P4.46.** Solve for $v_C(t)$ for $t > 0$ in the circuit of Figure P4.46. [*Hint:* Try a particular solution of the form $v_{Cp}(t) = Ae^{-3t}$.]

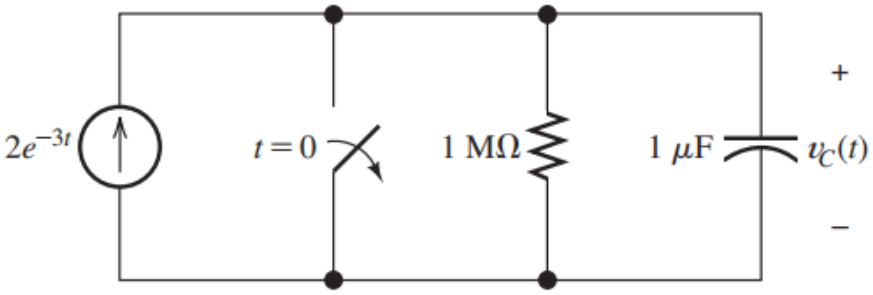
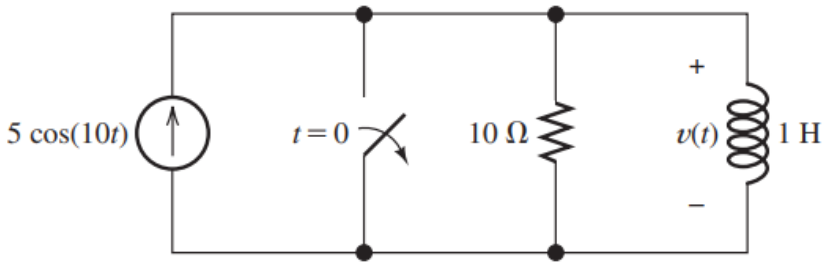


Figure P4.46

Q4)

***P4.47.** Solve for $v(t)$ for $t > 0$ in the circuit of Figure P4.47, given that the inductor current is zero prior to $t = 0$. [*Hint:* Try a particular solution of the form $v_p = A\cos(10t) + B\sin(10t)$.]



Q5)

P4.24. The circuit shown in Figure P4.24 has been set up for a long time prior to $t = 0$ with the switch closed. Find the value of v_C prior to $t = 0$. Find the steady-state value of v_C after the switch has been opened for a long time.

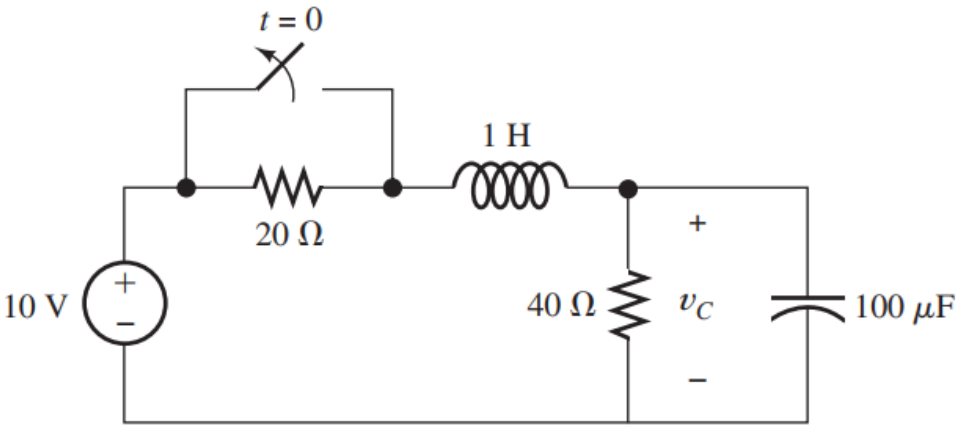


Figure P4.24

Q6)

P4.50. Consider the circuit shown in Figure P4.50. The initial current in the inductor is $i_s(0+) = 0$. Write the differential equation for $i_s(t)$ and solve. [*Hint:* Try a particular solution of the form $i_{sp}(t) = A\cos(300t) + B\sin(300t)$.]

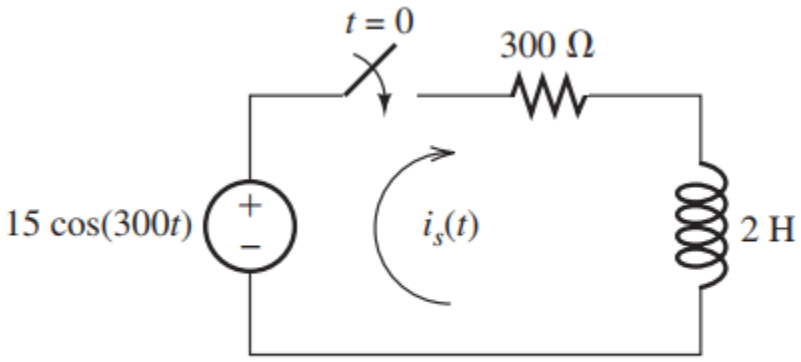


Figure P4.50