



## Final Exam

2017/2018

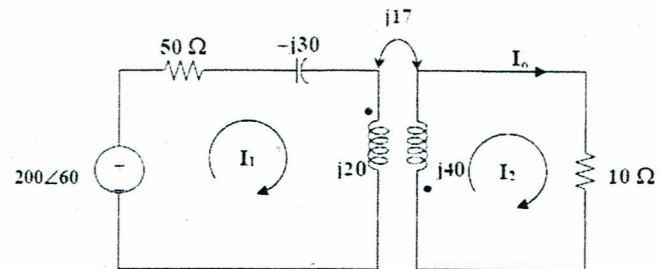
Subject: Electric Circuits  
 Stage: 2<sup>nd</sup>  
 Lecturer: Abdullallah Adil  
 Time: 3 hours

Date: 7/6/2018

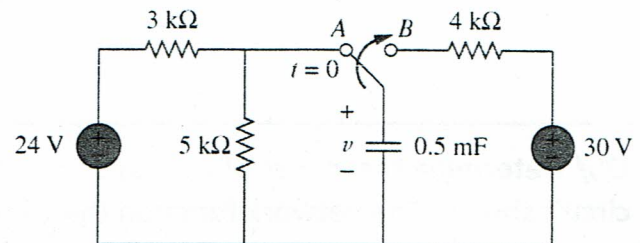
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Note: Answer five questions only (Each question is worth 20 marks)

Q1/ Find  $I_0$  for the circuit shown

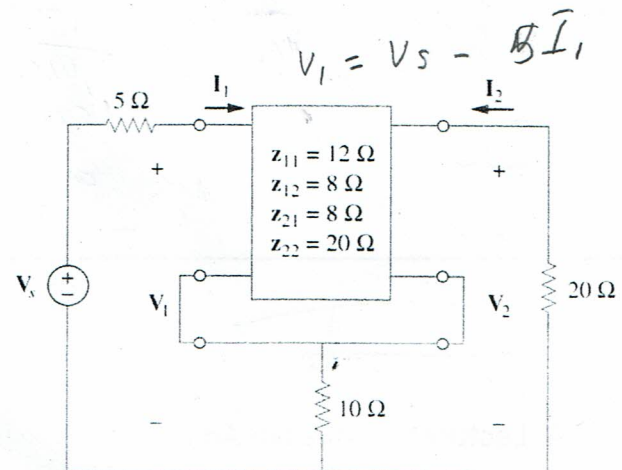


Q2/ For the circuit shown, the switch at position A for a long time. At  $t=0$ , switch moves to B. Determine  $v(t)$  and calculate its value at  $t=1s$  and  $4s$



Q3/ For the circuit shown find

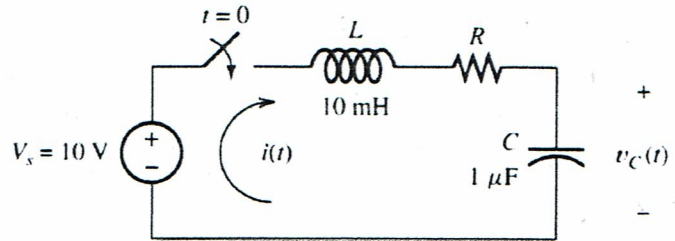
- Equations for  $I_1$  and  $I_2$  with respect to  $V_2$
- The value of  $V_2/V_s$
- The values of  $I_1$  and  $I_2$  when  $V_s = 20V$



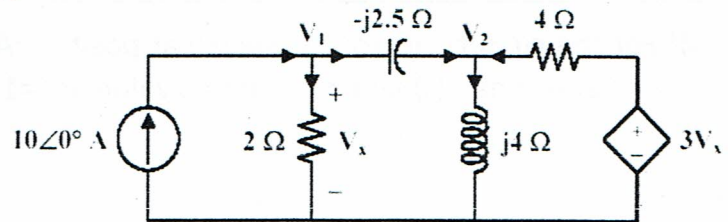
**Q4/** In the circuit shown  $R=200\ \Omega$ ,  $L=10\text{mH}$ ,  $C=1\mu\text{F}$  and  $V_s=10\text{V}$

- Calculate the characteristic roots of the circuit.
- Is the natural response overdamped, underdamped or critically damped?
- Calculate  $V_c(t)$

The current at the time  $t=0$  is  $i(0)=0$  and  $V_c(0)=0$

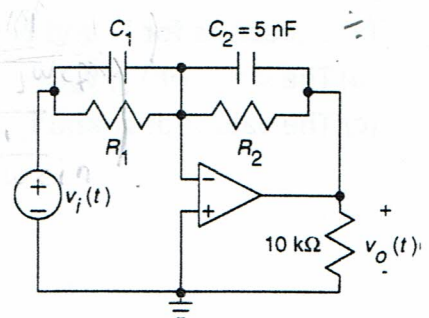


**Q5/** For the Circuit Shown, Find  $V_1$  and  $V_2$



**Q6/** Determine the values of the capacitance,  $C_1$ , and of the resistances,  $R_1$  and  $R_2$  for the circuit shown. The network function that represents this circuit is

$$H(\omega) = \frac{V_o(\omega)}{V_i(\omega)} = -20 \frac{1 + j \frac{\omega}{25000}}{1 + j \frac{\omega}{2500}}$$



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