Name: _____ ID#: _____

LEBANESE AMERICAN UNIVERSITY
Department of Electrical and Computer Engineering

ELE 302 – Electrical Circuits II
Midterm Exam 1

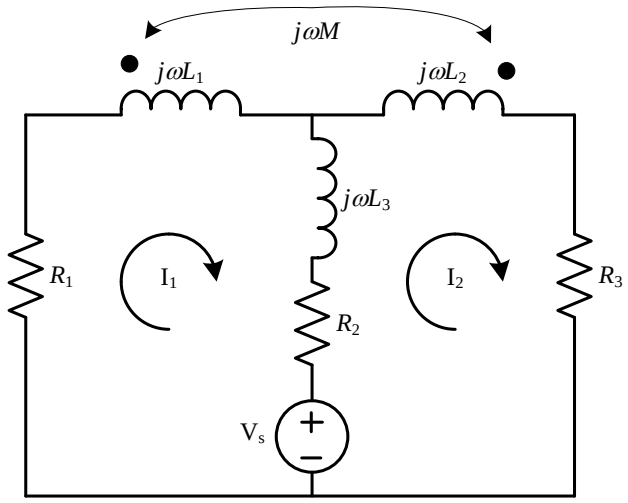
Duration: 1 hour
Start Time: 11:00 am

Date: 2/11/2011
Prepared by: Dr. Dani TANNIR

- **Answer each of the following questions in the space provided.**
- **This is a closed-book exam.**
- **Programmable Calculators are not allowed.**
- **The number of marks for each question is indicated next to the question number.**

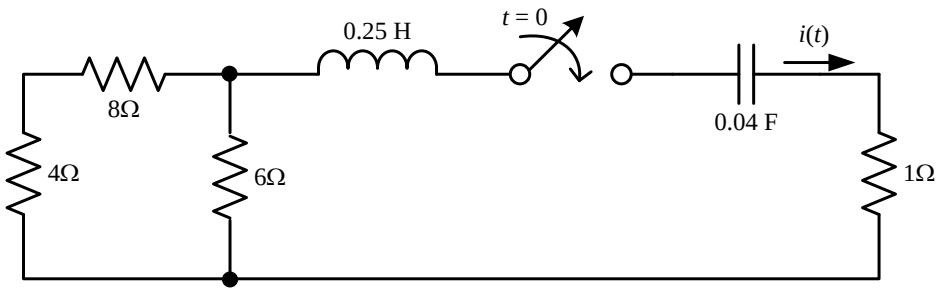
Question 1 *(3 marks)*

Write the mesh equations for the assigned mesh currents. Group the coefficients of each current variable together (Example: $K_1I_1 + K_2I_1 \rightarrow (K_1 + K_2)I_1$)



Question 2 *(4 marks)*

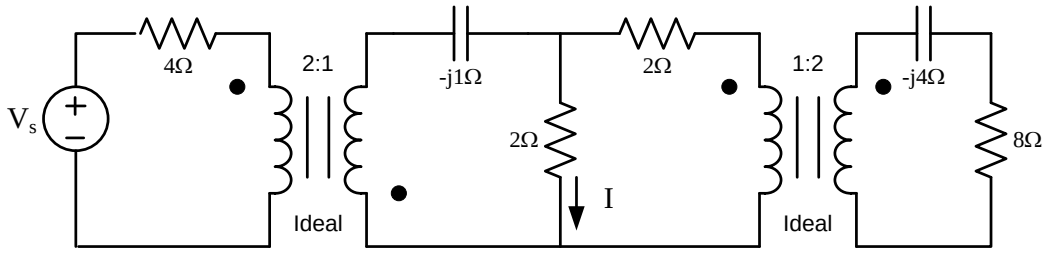
Consider the following Circuit



a) Determine the Characteristic Equation in *i(t)* for t > 0
b) Determine the roots of the Characteristic Equation
c) What type of damping does this circuit exhibit?

Question 3 *(6 marks)*

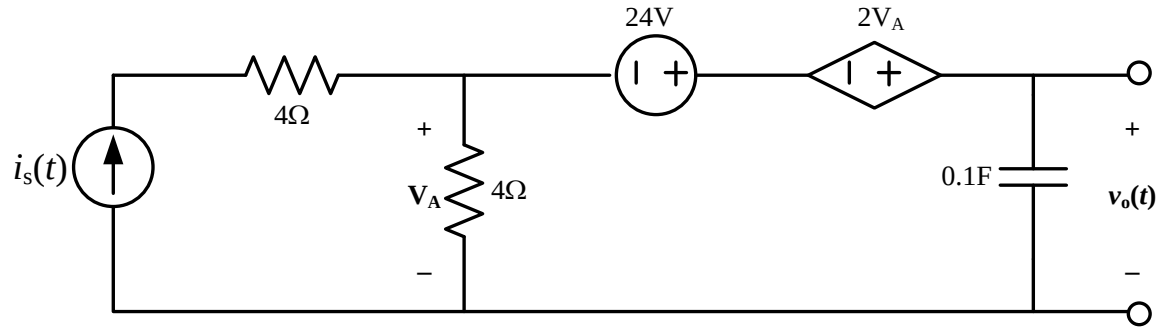
In the following circuit, if $I = 4\angle 30^0$ A, Determine the value of Vs



Note The relations for an ideal transformer are as follows $V_1 = \pm\frac{V_2}{n}; I_1 = \pm nI_2; Z_1 = \frac{Z_2}{n^2}; n = \frac{N_2}{N_1}$

Question 4 *(7 marks)*

Consider the following circuit



If $i_s(t)$ is defined as $i_s(t) = 3 - 3u(t\text{-}1)$, then

a) Sketch $i_s(t)$ as defined
b) Determine the general expression for the output voltage $v_0(t)$
c) Sketch $v_0(t)$ as determined in part (b)