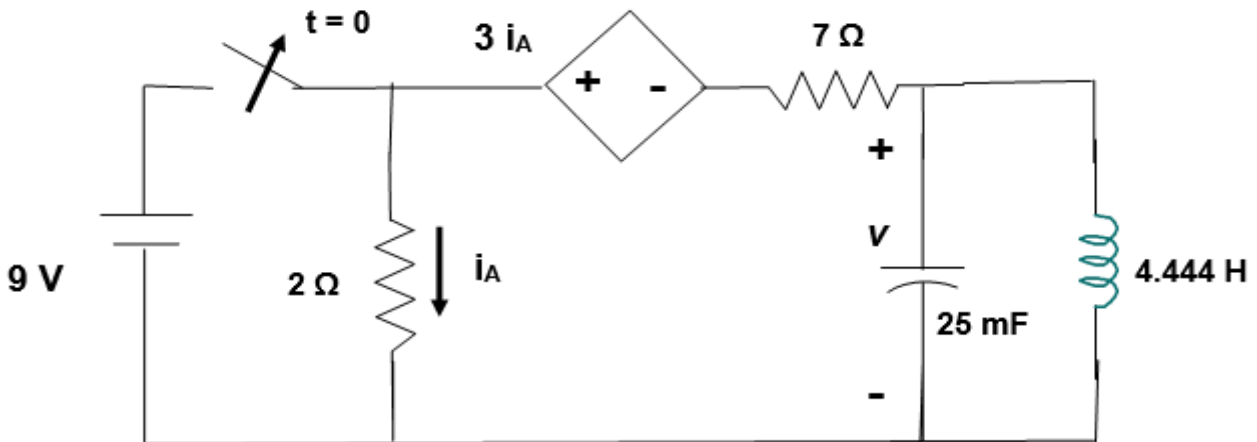**Name:** _Muhammad Umer_                                  Total Marks: 10

**Registration Number / Section:** _345834  BEE 12C_

## Home Assignment No 6: The RLC Circuit (CLO 3) AMENDED

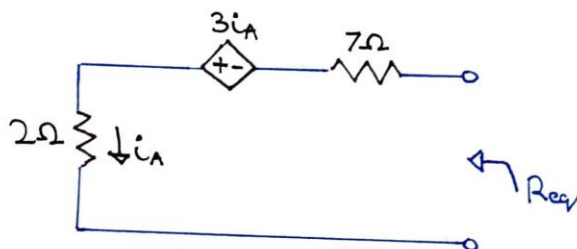Determine the values of **α** and **w₀** and show that it is an overdamped circuit.



For $t > 0$

$\alpha = \dfrac{1}{2RC}$ (Parallel)                    $\therefore L = 4.444H \quad C = 25mF$
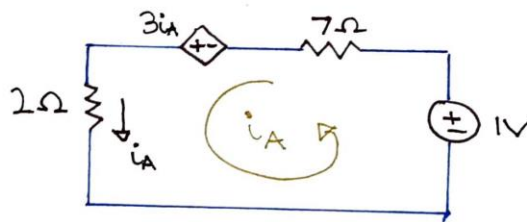
$W_0 = \dfrac{1}{\sqrt{LC}}$

Hence, we seek to find $R_{eq}$ to determine the type of response.

Circuit:



Using a test voltage source



• $-1 + 7i_A - 3i_A + 2i_A = 0$

$\quad 6i_A = 1$

$\quad i_A = 0.16667 A$

$R_{eq} = \dfrac{V_T}{i_T} = \dfrac{1}{0.16667} = \boxed{6\,\Omega}$

$\alpha = \dfrac{1}{2(6)(25 \times 10^{-3})} = \boxed{3.33\ s^{-1}}$

$W_0 = \dfrac{1}{\sqrt{(4.44)(25 \times 10^{-3})}} = \boxed{3.00\ rad\,s^{-1}}$

As $\alpha > W_0$, it is an overdamped circuit.