

BASICS OF ELECTRICAL CIRCUITS

Example Exam

1. (25 pts) Write the state equations for the circuit given in Figure 1.
2. (25 pts) For the circuit given in Figure 2, obtain the equations to analysis the circuit using generalized (modified) mesh current method ($v_6 = \gamma i_2$, $i_7 = \beta v_3$).
3. (25 pts) In figure 3, $i_k = 0.1 \sin(\omega t)$, $i_N = v_N^2$, $i_b = 2v_N$, $R_1 = 1\Omega$ find the approximate solutions of $V_N(t)$ for all operating points.
4. (25 pts) Find the Thevenin equivalent with respect to the terminals A and B for the circuit in Figure 4 ($v_5 = \alpha v_3$).

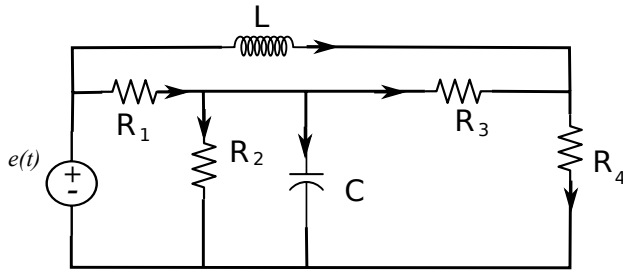


Figure 1

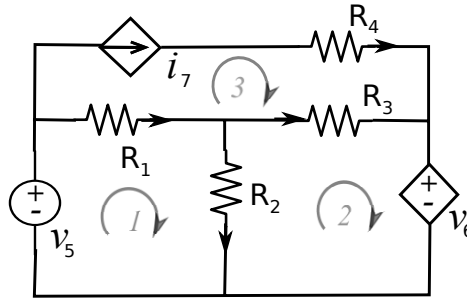


Figure 2

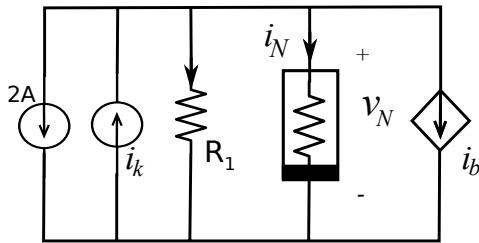


Figure 3

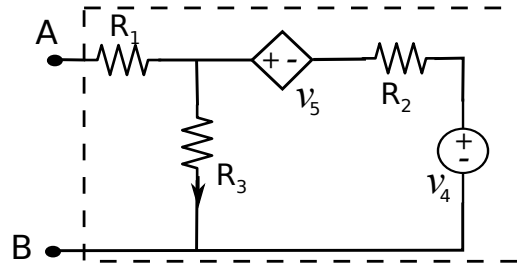


Figure 4