HOMEWORK-II

P 8.4-4 An electronic flash on a camera uses the circuit shown in Figure P 8.4-4. Harold E. Edgerton invented the electronic flash in 1930. A capacitor builds a steady-state voltage and then discharges it as the shutter switch is pressed. The discharge produces a very brief light discharge. Determine the elapsed time t_1 to reduce the capacitor voltage to one-half of its initial voltage. Find the current $i(t)$ at $t = t_1$.

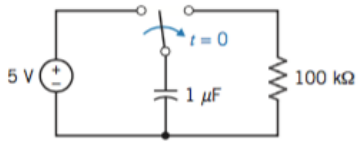

Figure P 8.4-4 Electronic flash circuit.

P 8.5-2 The circuit in Figure P 8.5-2 contains a current-controlled current source. What restriction must be placed on the gain B of this dependent source to guarantee stability?

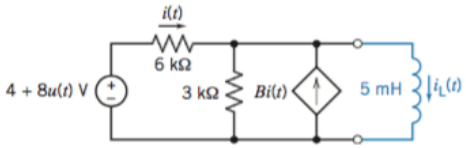

Figure P 8.5-2

P 6.4-7 Find v_o and i_o for the circuit shown in Figure P 6.4-7.

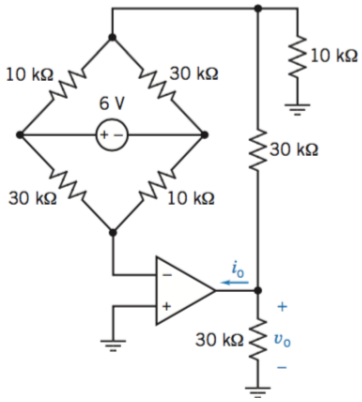

Figure P 6.4-7

P 5.5-9 Find the Norton equivalent circuit for the circuit shown in Figure P 5.5-9.

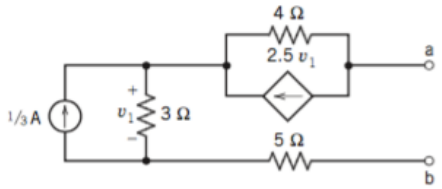

Figure P 5.5-9

P 6.4-4 The output of the circuit shown in Figure P 6.4-4 is v_o. The inputs are v_1 and v_2. Express the output as a function of the inputs and the resistor resistances.

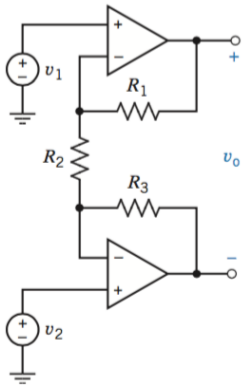

Figure P 6.4-4

P 6.3-14 Determine the node voltages at nodes a, b, c, and d of the circuit shown in Figure P 6.3-14.

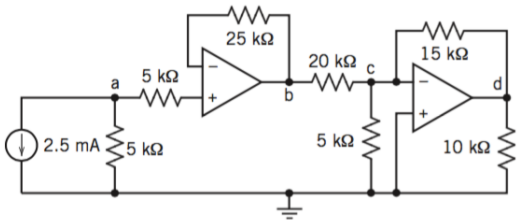

Figure P 6.3-14

P 5.4-15 Consider the circuit shown in Figure P 5.4-15. Replace the part of the circuit to the left of terminals a–b by its Thévenin equivalent circuit. Determine the value of the current i_o.

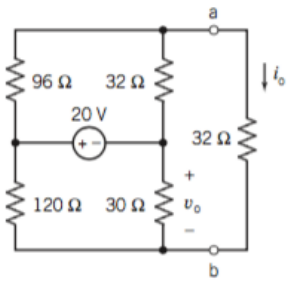

Figure P 5.4-15

P 8.6-6 Studies of an artificial insect are being used to understand the nervous system of animals. A model neuron in the nervous system of the artificial insect is shown in Figure P 8.6-6. A series of pulses, called synapses, is required. The switch generates a pulse by opening at $t = 0$ and closing at $t = 0.5$ s. Assume that the circuit is in steady state and that $v(0^-) = 10$ V. Determine the voltage $v(t)$ for $0 < t < 2$ s.

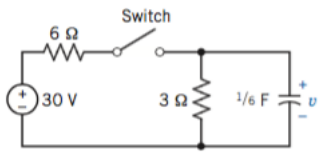

Figure P 8.6-6 Neuron circuit model.