VE215
Assignment #5
Fall 2016

Problem 1

Determine $v_o(t)$ for $t > 0$ in the circuit of Fig.1. Let $i_s = 10u(t)$ μA and assume that the capacitor is initially uncharged.

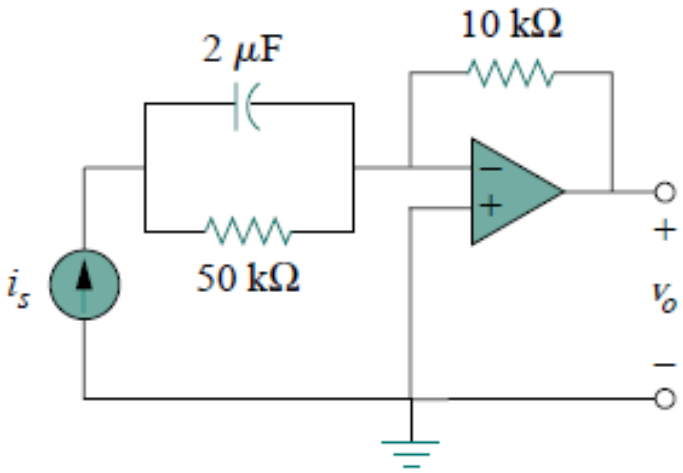

Figure 1

Problem 2

For the network shown in Fig. 2, find v(t) for t > 0.

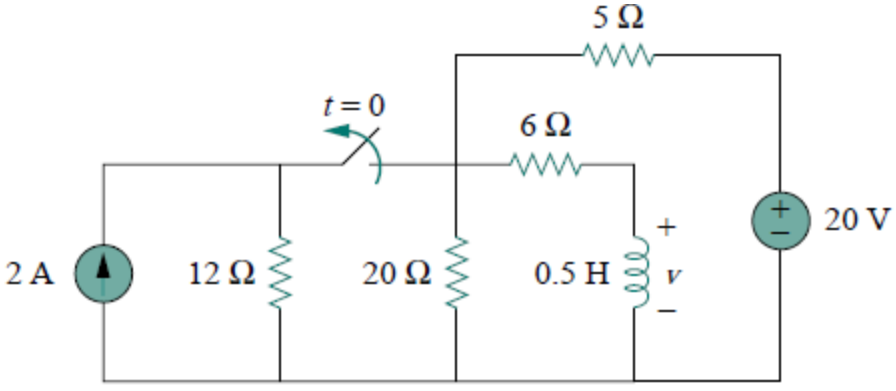

Figure 2

Problem 3

In the circuit in Fig. 3, find *ix* for $t > 0$. Let $R1 = R2 = 1$ kΩ, $R3 = 2$ k_, and $C = 0.25$ mF.

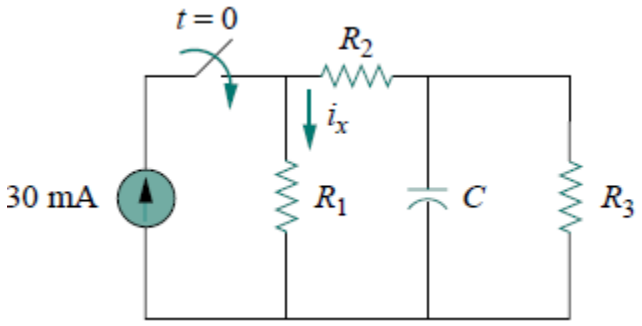

Figure 3

Problem 4

A 120-V dc generator energizes a motor whose coil has an inductance of 50 H and a resistance of 100 Ω. A field discharge resistor of 400Ω is connected in parallel with the motor to avoid damage to the motor, as shown in Fig. 4. The system is at steady state. Find the current through the discharge resistor 100 ms after the breaker is tripped.

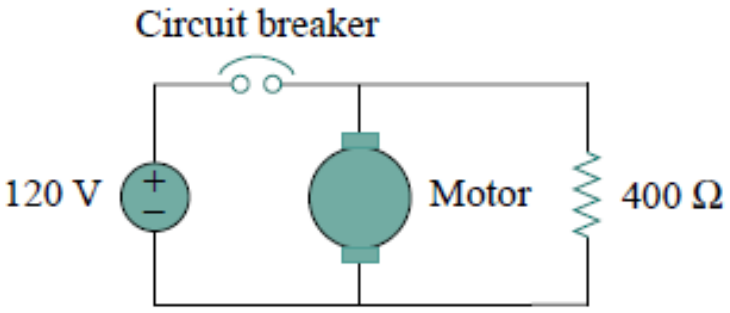

Figure 4

Problem 5

Figure 5 presents an analog computer designed to solve a differential equation. Assuming *f (t)* is known, set up the equation for *f (t)*.

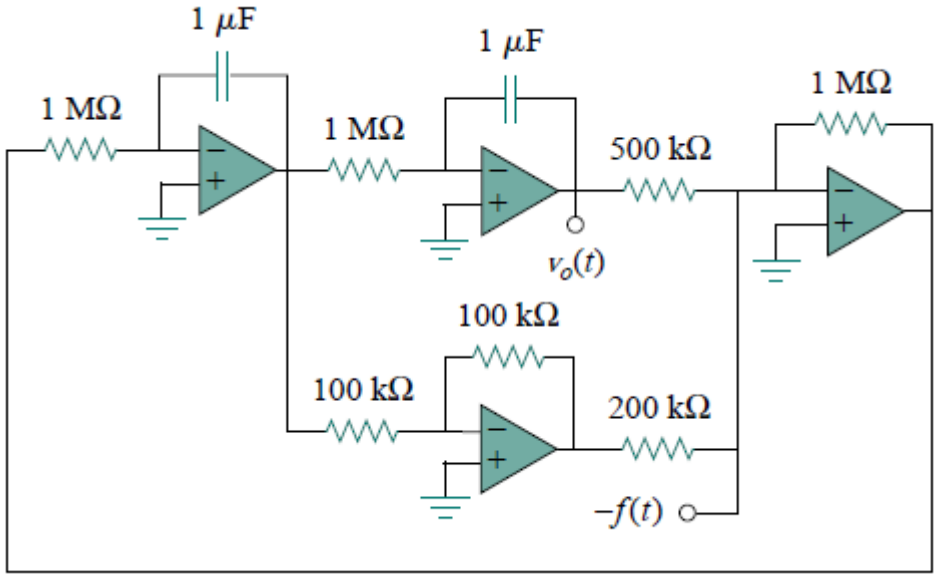

Figure5

Problem 6

An op amp integrator with $R = 4$ M Ω and $C = 1$ μF has the input waveform shown in Fig. 6. Plot the output waveform.

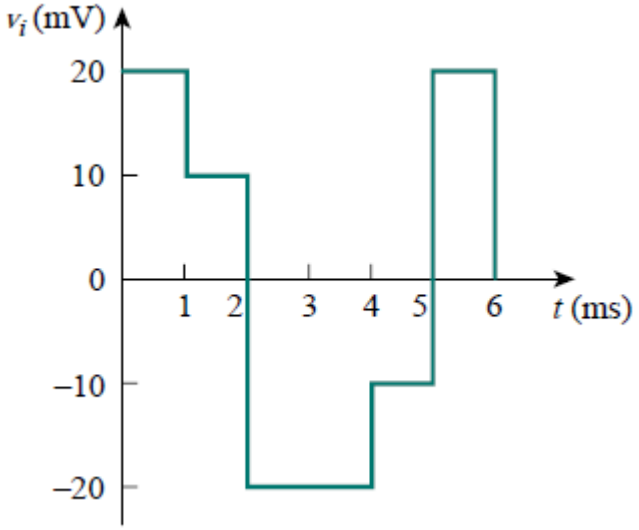

Figure 6