1. (a) 4000 million electrons in 0.0002 second flow through one point in a line, calculate how much current is in a line. (10%), (b) 5000 million electrons takes -0.02 μJ to move from c point to d point, Find the voltage V_{cd} from c point to d point. J=Joule (10%).

2. Use network transformation method to find R_{ab} and I in Figure 1. (20%)

3. In Figure 2, $V_s(t)= 5\cos(2.5*10^8 t)$ V, (a) write down the differential equation by using $V_s(t)$, $V_1(t)$, and $V_o(t)$ (10%) and (b) solve the equation by Laplace transform and find $V_o(t)$ (15%). Assume zero initial conditions at capacitor.

4. Find three line currents in Figure 3 by using loop or mesh analysis. (20%).

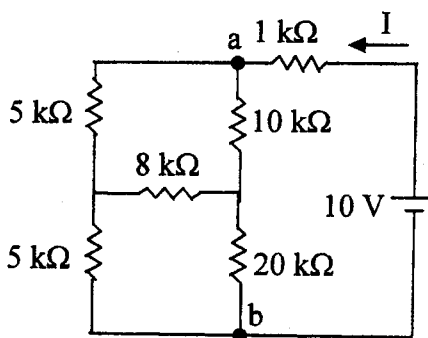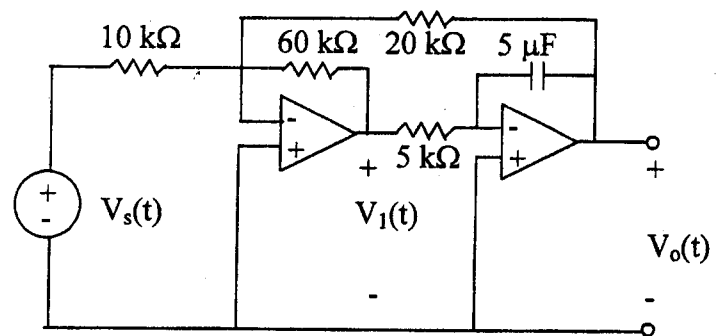5. Find the power delivering to the 40Ω resistor in Figure 4. (15%).
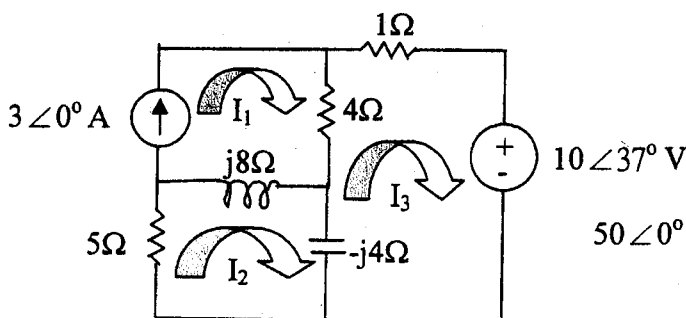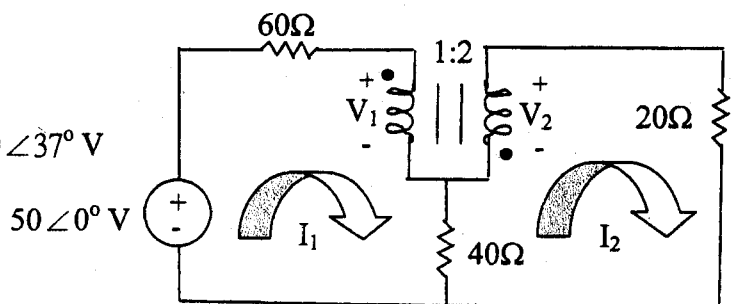

Figure 1

Figure 2

Figure 3

Figure 4