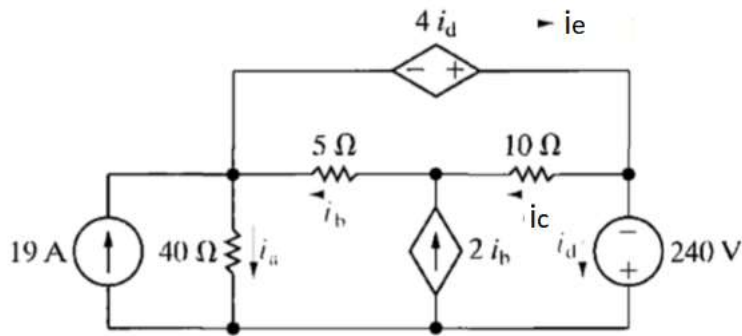# EE231 Midterm Exam I

1)

Figure 1

a) (10 pts) Use the node-voltage method to find the branch currents $i_a - i_e$ for the circuit shown in Figure 1.

b) (10 pts) the mesh-current method to find the branch currents $i_a - i_e$ for the same circuit.

c) (5 pts) Check your answers by showing that the total power generated equals the total power dissipitated.
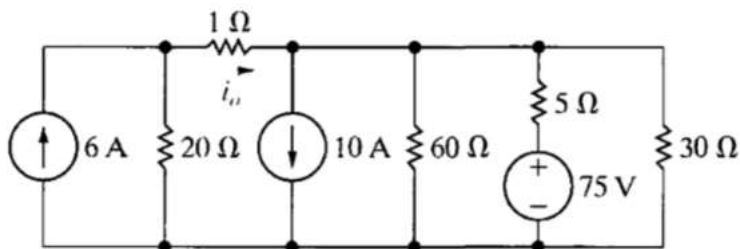
2) (25 pts)

Figure 2

Use a series of source transformation to find the current i_0 in the circuit shown in Figure 2.
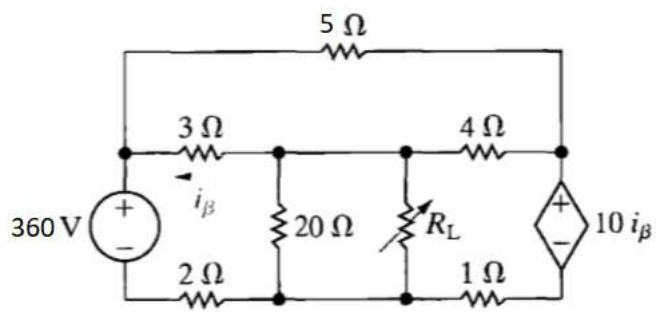
3)

Figure 3

The variable resistor R_L in the circuit in Figure 3 is adjusted for maximum power transfer to R_L.

   a) (10pts) Find the numerical value of R_L.

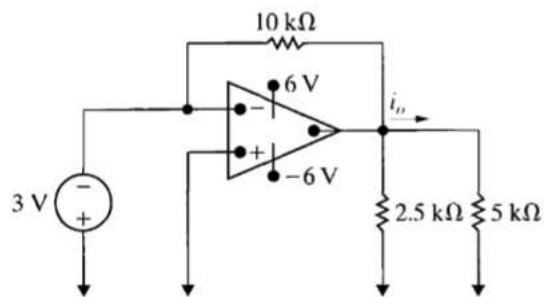   b) (15 pts) Find the maximum power transferred to R_L.

4) (25 pts)

Figure 4

Find i_0 in the circuit in Figure 4 if the op amp is ideal.