1. Use Δ -to-Y transformation to solve the phasor current I, in Fig. 1. (15%)
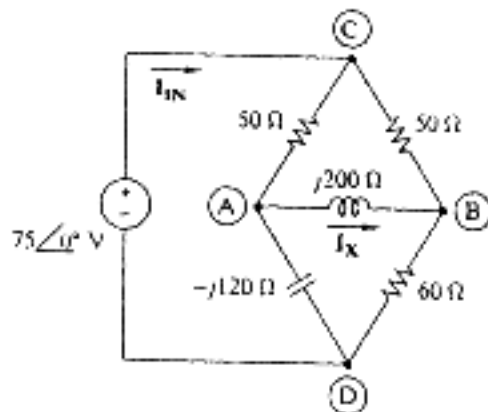

Fig. 1

2　Find I_A, I_B, V_1, V_2, and the impedance Z_{IN} seen by the source circuit in Fig. 2.
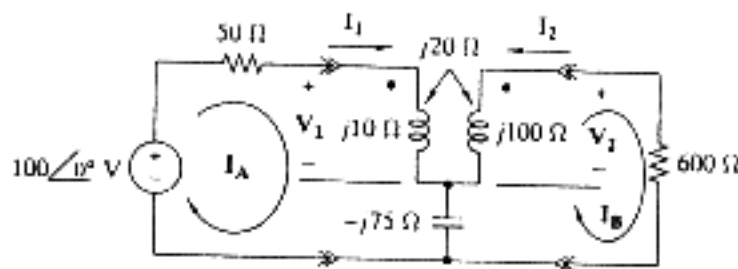(10 %)

Fig. 2

3. (a) Use convolution to find the output of the circuit in Fig. 3 when the input is $v_1(t) = tu(t)$. (5%)

   (b) Use s-domain analysis to find the circuit output for the same input. (5%)
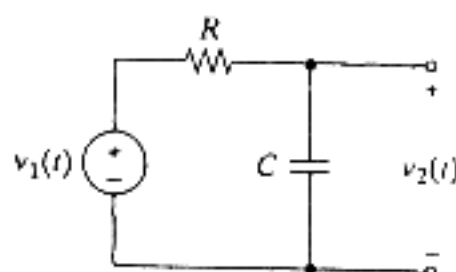

Fig. 3

4.　A Δ -connected load with Z=40+j30 Ω/phase is driven by a balanced, positive sequence three-phase generator with V_L = 2400 V (rms). By using V_{AN} as the phase reference,

   (a) Find the phase currents. (5%)

   (b) Find the line current. (5%)

   (c) Find the average and reactive power delivered to the load. (5%)

5. Please compute the power delivered by the dependent current source ($1.6V_a$) of Fig. 4. (15 %)
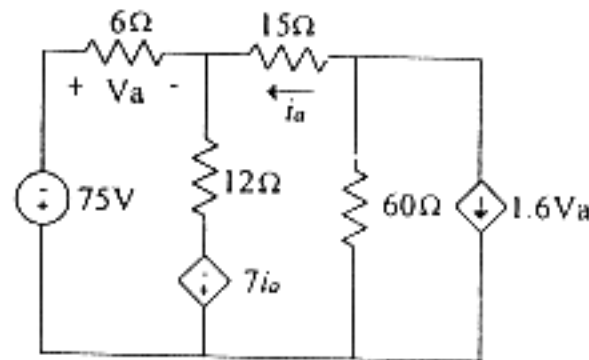

Fig. 4

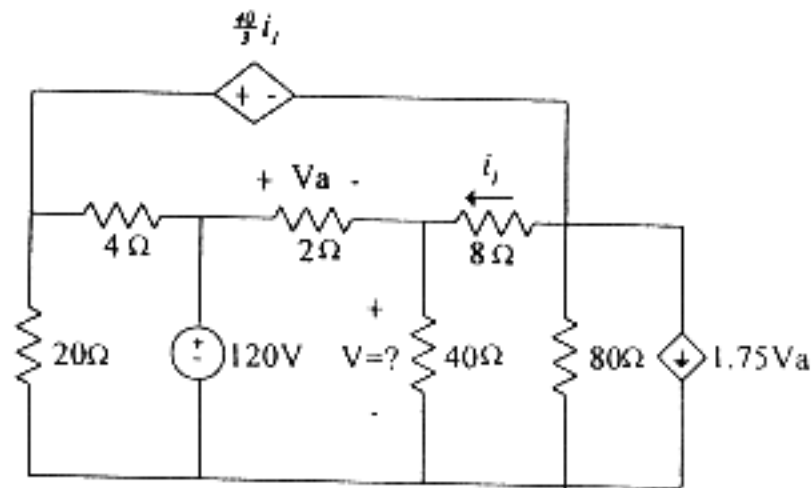6. Please find the voltage across the 40Ω resistor in Fig. 5. (15 %)

Fig. 5

7. In Fig. 6, please find the value of the resistor R_1 that is adjusted to consume the maximum power. (20 %)
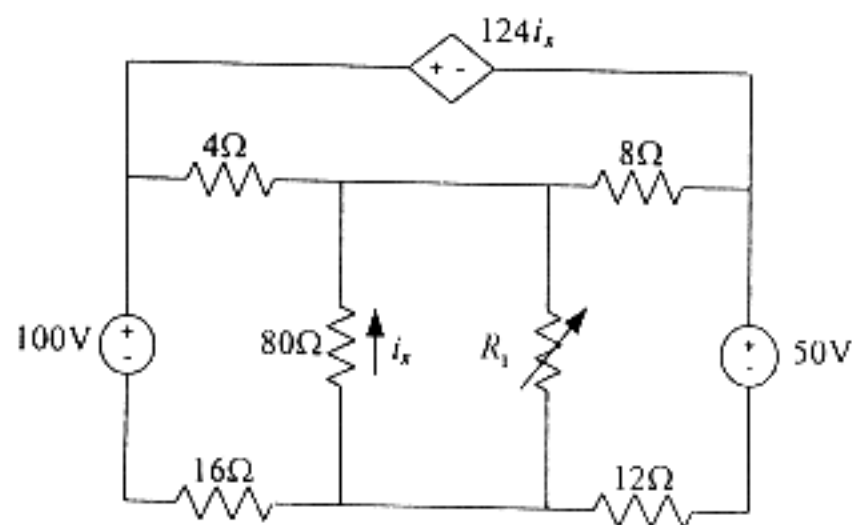

Fig. 6