1. The input, and output of the network are shown in Fig. 1. Obtain the unknown element values. (20 %)

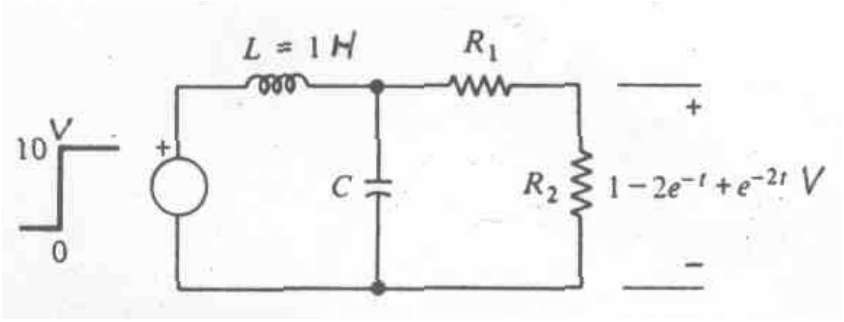

Fig. 1

2. A linearly rising voltage is applied to the RLC network shown in Fig. 2. How much energy is supplied by the source in one second? (20 %)

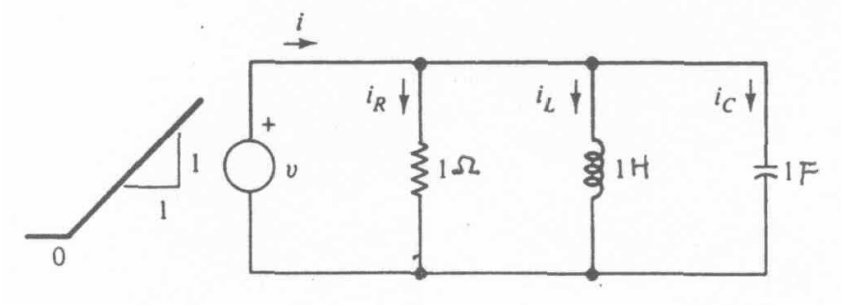

Fig. 2

3. For the circuit in Fig. 3,
   (a) Find the Thevenin equivalent circuit with respect to the terminals a, b for the circuit shown in Fig. 3. (10 %)
   (b) Find the load impedance Z if maximum average power is delivered to Z. (5 %)
   (c) Find the maximum average power delivered to Z. (5 %)

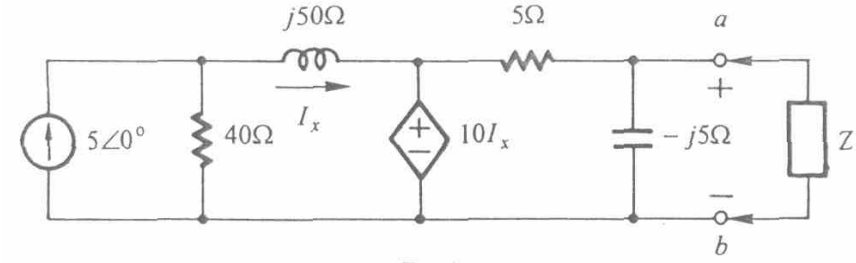

Fig. 3

4. Let $i_s = 5u(-t) - 15u(t)$ in Fig. 4. Find
   (a) $V_R(0^+)$ (5%)
   (b) $\frac{dV_C(0^+)}{dt}$ (5%)
   (c) $\frac{di_L(0^+)}{dt}$ (5%)

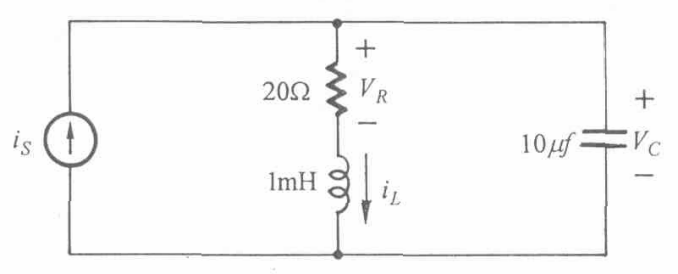

Fig. 4

5. A balanced Y-connected load is supplied by a balanced power system in which $Z = 10 + j10$ Ω, $V_{ab} = 100\sqrt{6} \angle 0^0$ Volt, $V_{bc} = 100\sqrt{6} \angle -120^0$ and $V_{ca} = 100\sqrt{6} \angle +120^0$ Volt. Two wattmeters are arranged to measure the total power received by the load and the circuit is shown in Fig. 5.
   (a) Find the reading value of wattmeter A. (7%)
   (b) Determine the total power absorbed by the load. (8%)

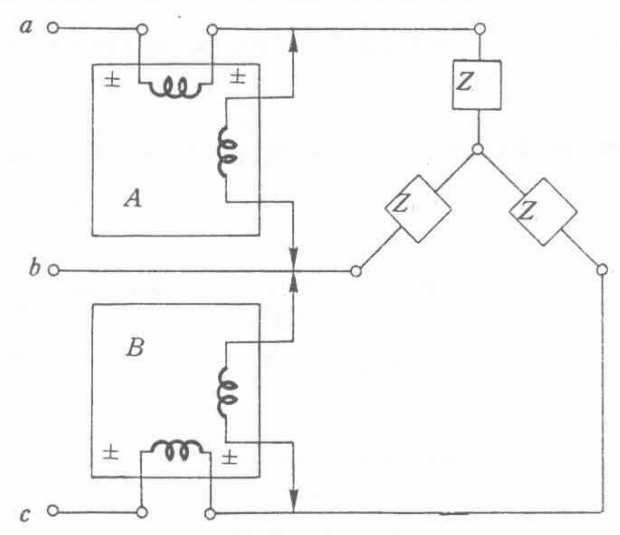

Fig. 5

6. In Fig. 6, R_1, R_2, and R_3 are fixed. For what turns ratio is the output voltage maximum? (10%)

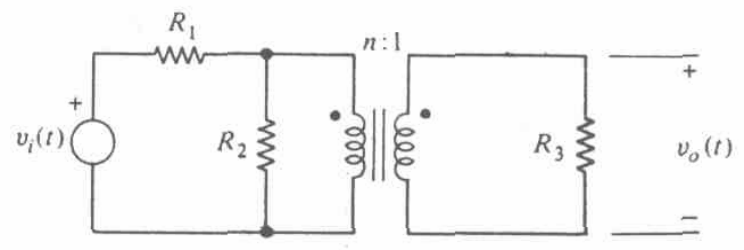

Fig. 6