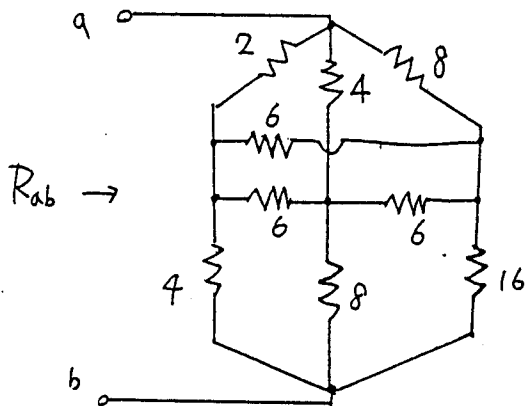
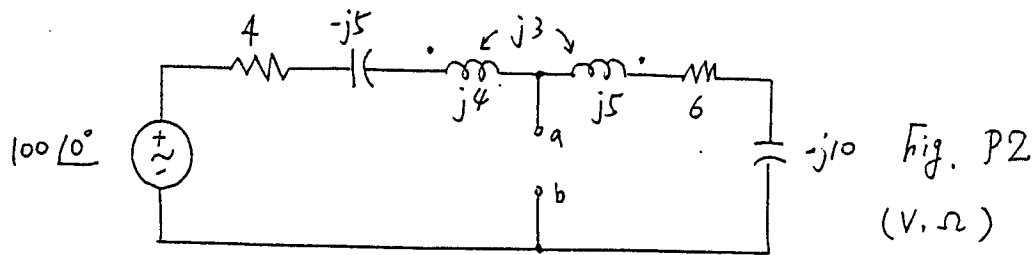
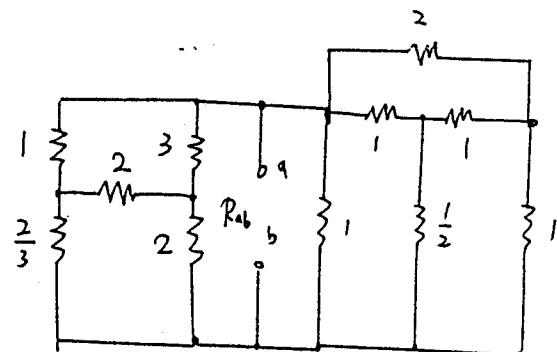


1. Explain and draw an example for the following terms: (5% each)
(a) the lattice network (b) two-port network (c) nonplanar network (d) the impedance bridge
2. For the circuit shown in Fig. P2, find the open-circuit voltage $V_{ab|oc}$, the short-circuit current $I_{ab|sc}$, and the input impedance Z_{ab} , respectively. Then check your results to show:
 $V_{ab|oc} = I_{ab|sc} \cdot Z_{ab}$. (20%)
3. There are N independent voltage sources connected in series: $V(t) = V_1(t) + V_2(t) + \dots + V_N(t)$ to supply a resistive load R . Show that the average power absorbed by R is the sum of the average power supplied by each voltage source if the N independent voltage sources are orthogonal signals. (20%)
4. For the circuit shown in Fig. P4 (a) and (b), determine the equivalent resistance R_{ab} . (each 10%)
5. The simple series RLC resonant circuit is shown in Fig. P5. Show that:
(a) the voltages across inductor L and capacitor C are both Q times the source voltage and are 180° out of phase to each other, where Q is the quality factor of the circuit. (10%)
(b) the sum of energies of both inductor and capacitor is a constant at any instant. (10%)



(a) Fig. P4 (Ω)



(b)

