

台灣科技大學一百零七學年度下學期平時考（一）

科目名稱：電路學(二) 開課系所：電子系 ET2104301 地點：國際大樓 IB308

考試時間：108 年 3 月 28 日 下午 13:20 至 15:10 (可使用工程計算機)

1. (15%) Please find I_o in Fig. 1.

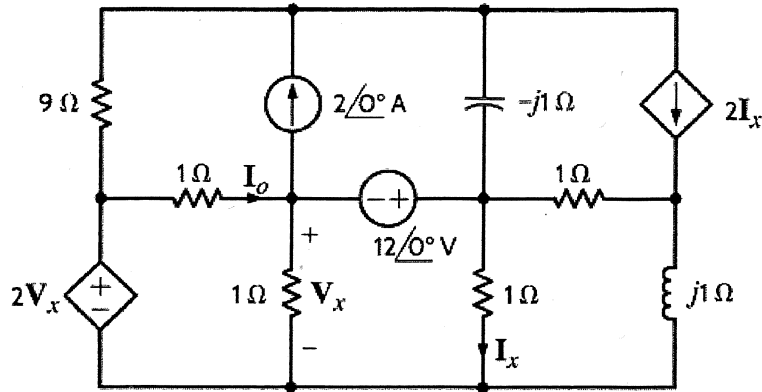


Fig. 1.

2. (15%) Please use Norton's theorem to find V_o in Fig. 2.

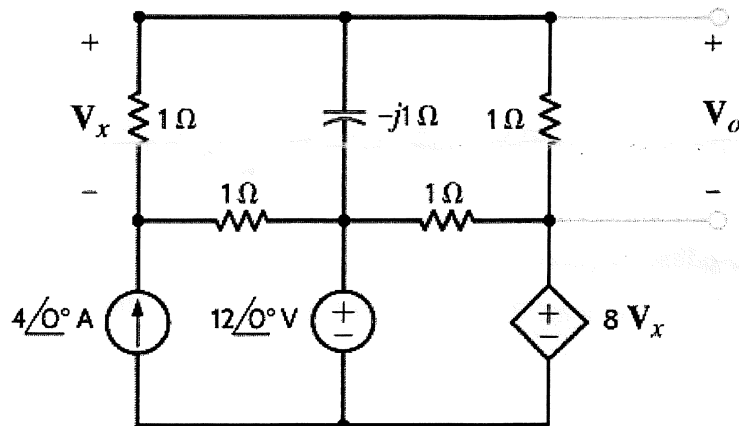


Fig. 2.

3. (15%) Please determine Z_L for maximum average power transfer and the value of the maximum average power transferred to Z_L in Fig. 3.

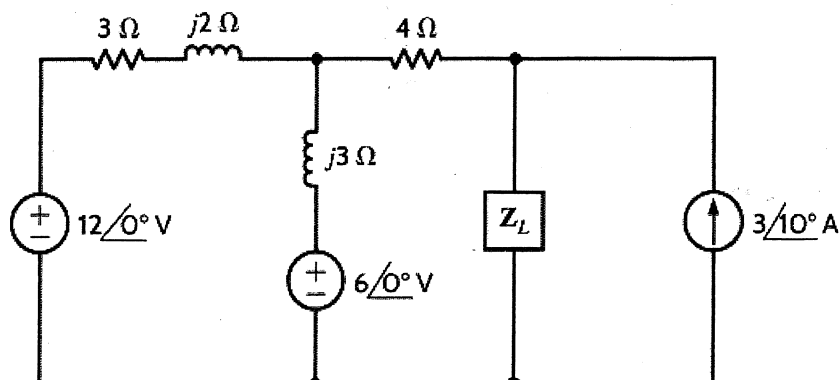


Fig. 3.

4. (15%) For the circuit in Fig. 4, please find the complex power supplied by the source, and the source power factor. If $f = 60\text{Hz}$, please find $V_s(t)$.

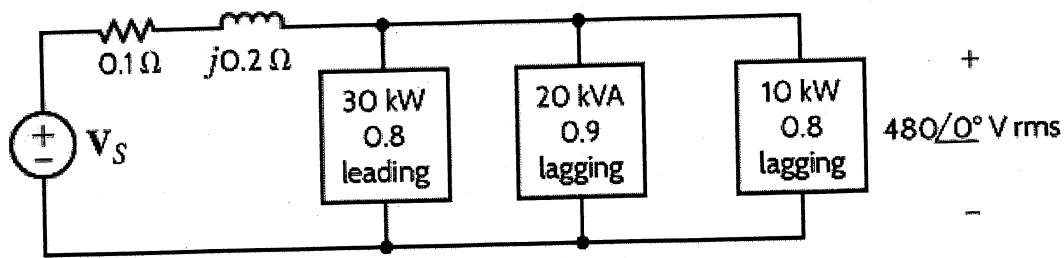


Fig. 4.

5. (15%) A balanced three-phase source serves the following loads:
- Load 1: 24 kVA at 0.8 pf lagging.
 - Load 2: 10 kVA at 0.7 pf leading
 - Load 3: 10 kW at unity pf.
 - Load 4: 16 kVA at 0.8 pf lagging
- The line voltage at the load is 208Vrms at 60 Hz, and the line impedance is $0.02 + j0.04\Omega$. Please find the line voltage and the power factor at the source.
6. (10%) In a balanced three-phase wye-wye system, the source is an abc-sequence set of voltages and $V_{an} = 120\angle 40^\circ \text{Vrms}$. If the a-phase line current and line impedance are known to be $7.1\angle -10.28^\circ \text{Arms}$ and $0.8 + j1\Omega$ respectively, please find the load impedance.
7. (15%) An abc-phase-sequence three-phase balanced wye-connected source supplies a balanced delta-connected load. The impedance per phase in the delta load is $12 + j6\Omega$. The ^{phase} line voltage at the source is $V_{an} = 120\sqrt{3}\angle 40^\circ \text{Vrms}$. If the line impedance is zero, please find the line currents in the balanced wye-delta system.