

國立宜蘭大學
96 學年度轉學招生考試

(考生填寫)
准考證號碼：

電 路 學 試 題

《作答注意事項》

1. 請先檢查准考證號碼、座位號碼及答案卷號碼是否相符。
2. 考試時間：80 分鐘。
3. 本試卷共有 8 大題，各題配分均標示於題目後，共計 100 分。
4. 請將答案寫在答案卷上；無推導計算過程及單位者不計分。(請用黑、藍原子筆作答)
5. 考試中禁止使用大哥大或其他通信設備。
6. 考試後，請將試題卷及答案卷一併繳交。
7. 本試卷採雙面影印，請勿漏答。

1. For the circuit shown in Fig. 1:

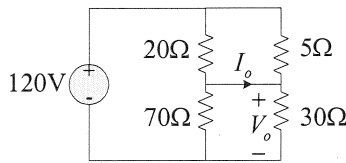


Fig. 1

- (a) Find current I_o and voltage V_o . (10%)
(b) Calculate the power dissipated in the 5Ω resistor. (5%)

2. Find the Norton equivalent circuit at terminals a-b of the circuit in Fig. 2. (10%)

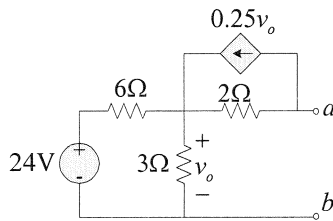


Fig. 2

3. Find v_o and i_o in the circuit of Fig. 3. Assume the OPA is ideal. (10%)

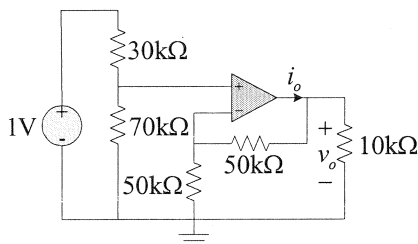


Fig. 3

4. Using the superposition to find $i(t)$ in the circuit of Fig. 4 under steady state. (15%)

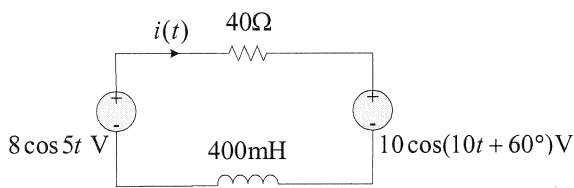


Fig. 4

5. It is desired to transfer maximum power to the load Z_L in the circuit of Fig. 5, find Z_L and the maximum power. (15%)

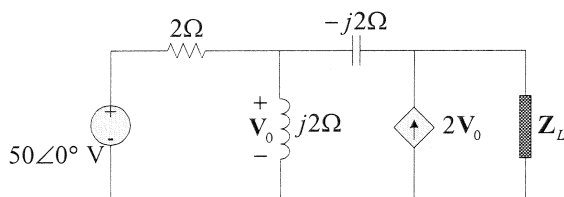


Fig. 5

6. A 220Vrms, 60Hz source supplies two loads connected in parallel as shown in Fig. 6.
- Find the total complex power and power factor of the parallel combination. (10%)
 - Calculate the value of the capacitance connected in parallel that will raise the power factor to 0.95. (5%)

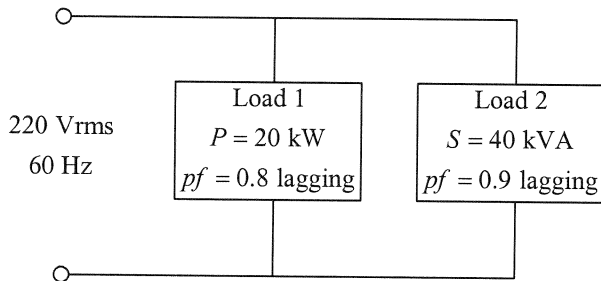


Fig. 6

7. A balanced delta-connected load has a phase current $\mathbf{I}_{AC} = 20\angle -25^\circ \text{ A}$.
- Determine the three line currents assuming that the circuit operates in the positive phase sequence. (5%)
 - Calculate the load impedance if the line voltage is $\mathbf{V}_{AB} = 120\angle 0^\circ \text{ V}$. (5%)

8. Calculate the phasor currents \mathbf{I}_1 and \mathbf{I}_2 in the circuit of Fig. 7. (10%)

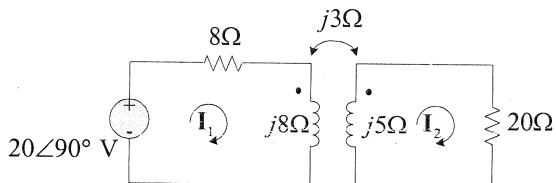


Fig. 7

1. For the circuit shown in Fig. 1:

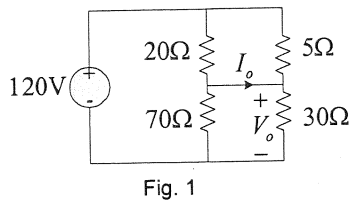


Fig. 1

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(b) Calculate the power dissipated in the 5Ω resistor. (5%)

2. Find the Norton equivalent circuit at terminals a-b of the circuit in Fig. 2. (10%)

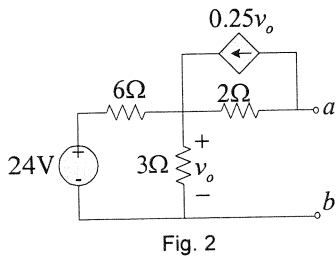


Fig. 2

3. Find v_o and i_o in the circuit of Fig. 3. Assume the OPA is ideal. (10%)

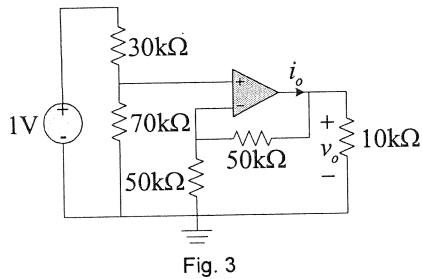


Fig. 3

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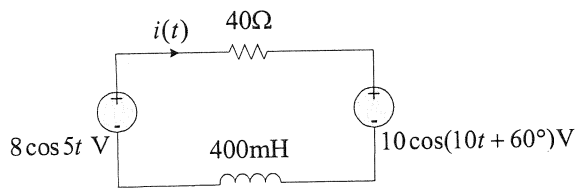


Fig. 4

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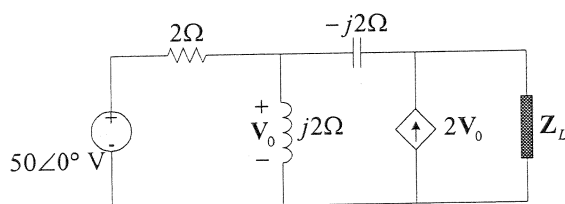


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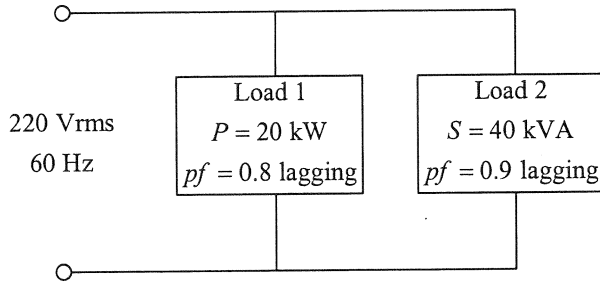


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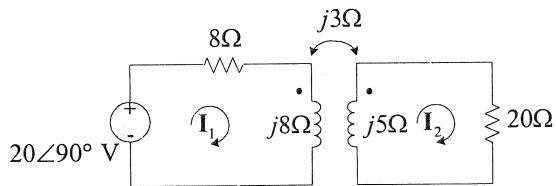


Fig. 7