

大同大學 101 學年度研究所碩士班入學考試試題

考試科目：電路學

所別：電機工程研究所

第1/1頁

註：本次考試 不可以參考自己的書籍及筆記； 不可以使用字典； 可以使用計算器。

1. (a) Using mesh analysis, find I_o and V_o for Fig. 1. (b) Please find the Thevenin equivalent resistance R_{th} in Fig. 2 at the terminal A-B. (30%)

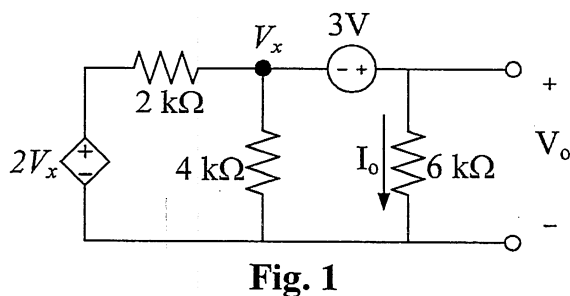


Fig. 1

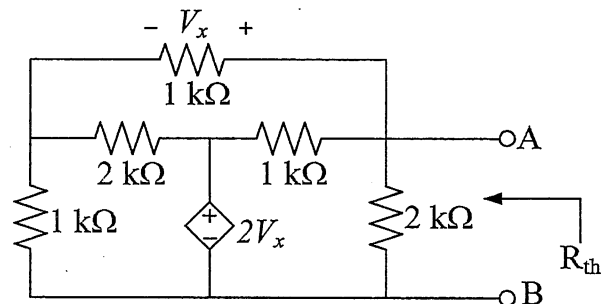


Fig. 2

2. The Laplace transform of a capacitor voltage is given by

$$V_C(s) = \frac{2}{s} - \frac{1}{5s+2}$$

Find the initial capacitor voltage $v_C(0^+)$. (15%)

3. For the circuit of Fig. 3, let $v_{in}(t) = -18u(-t) + 9u(t)$ V. Find $i_{in}(t)$ for $t > 0$. (20%)

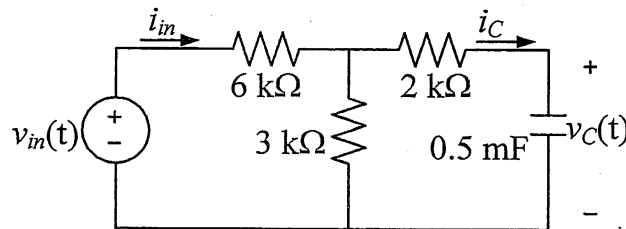


Fig. 3 RC circuit with $i_{in}(t)$ as the desired response

4. There is a three-phase system with one-line diagram as shown in the following figure. The load is 800 kW at 0.8 power factor leading. The terminal voltage at load is 11.4 kV (line-line). Determine the (a) the line current, (b) the sending end voltage, and (c) if power factor of the load is improved to be 1.0, what the kVA rating of a reactor should be installed. (15%)

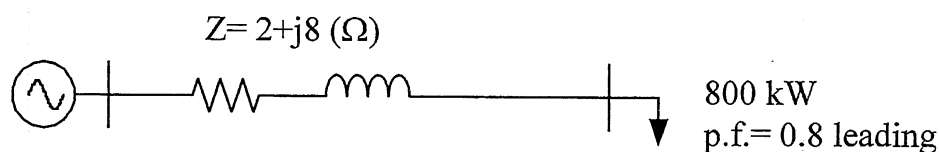


Fig. 4

5. A three-phase system has a load with real power of 0.8 p.u. at 0.8 power factor lagging, and a synchronous motor drawing real power of 0.6 p.u. The one-line diagram is showing in the following figure. Find (a) the θ , (b) the Q_s , (c) the line current, and (d) the total real and reactive power supplied by source. (20%)

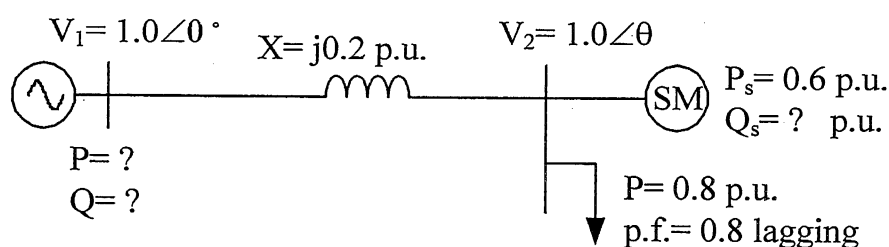


Fig. 5