

國立臺北科技大學 107 學年度碩士班招生考試

系所組別：1413 能源與冷凍空調工程系碩士班甲組

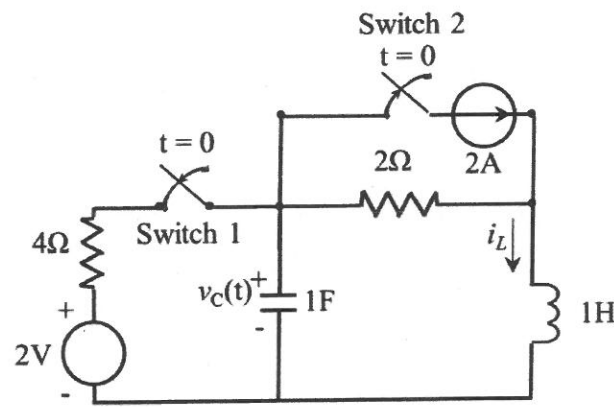
第二節 電路學 試題 (選考)

第一頁 共一頁

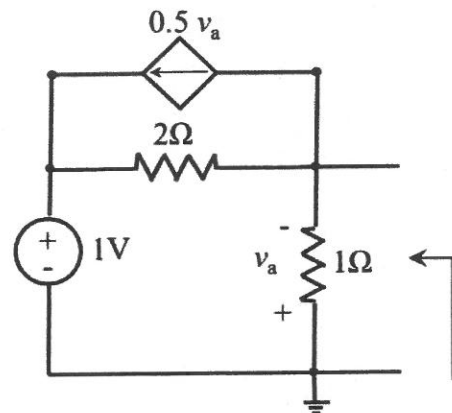
注意事項：

1. 本試題共五題，每題 20 分，共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

1. Find $i_L(0^+)$, $v_C(0^+)$, $d i_L(0^+)/dt$ and $d v_C(0^+)/dt$ for the circuit shown below. Assume that switch 1 has been open and switch 2 has been closed for a long time and steady-state conditions prevails at $t = 0^-$ (20%)

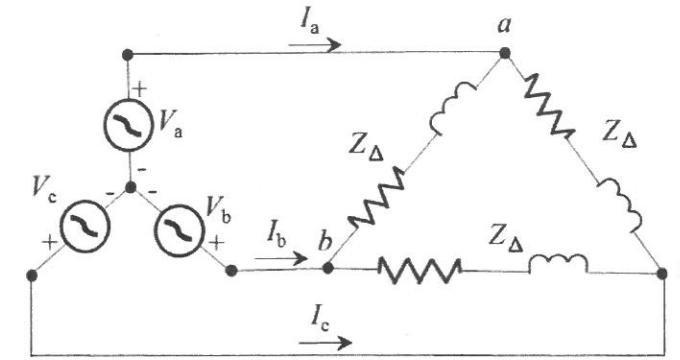


2. Find the Thévenin equivalent circuit for the circuit shown below. (20%)

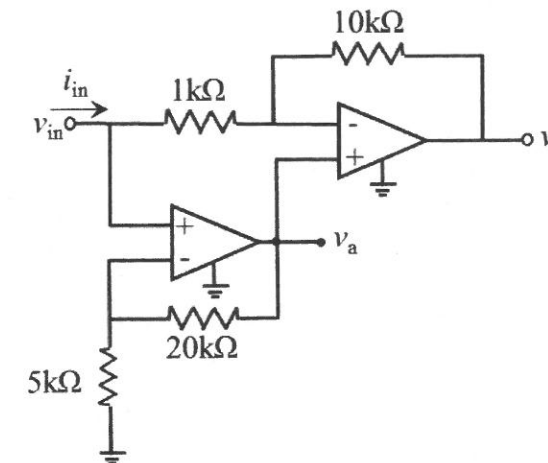


3. A three-phase circuit shown below, with phase voltage $V_a = 127 \angle 0^\circ \text{V}$, $V_b = 127 \angle -120^\circ \text{V}$, $V_c = 127 \angle 120^\circ \text{V}$, and load impedance $Z_\Delta = 9 + j12\Omega$. Please calculate:

- (1) Line current I_a, I_b, I_c . (10%)
- (2) The real power, reactive power and power factor of the load. (10%)



4. Both OP-Amps in following figure are ideal. Please calculate v_b/v_{in} and $R_{in} = v_{in} / i_{in}$. (20%)



5. For the circuit shown below, please calculate:

- (1) The resistance R which makes the transient response critical damping. (10%)
- (2) V_{out} with a given $R = 5.2\Omega$ and $V_{in} = 0$ ($t < 0$), $10xe^{-5t}$ ($t > 0$). (10%)

