

生機系電工學第四次練習 ANS 2012/04/11

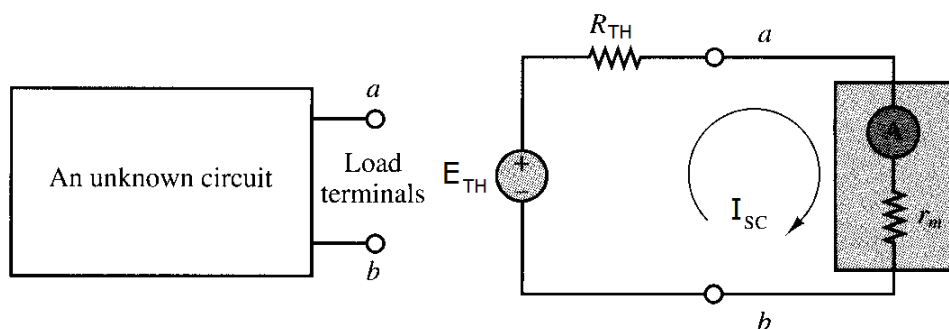
學號：_____ 姓名：_____

Experimental Determination of Thevenin Equivalent Circuit of an unknown circuit

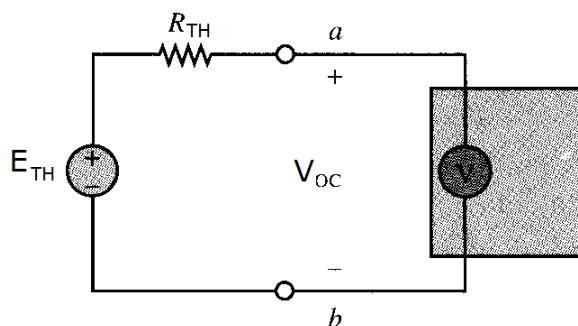
使用的伏特計假設為理想伏特計，測得開口端電壓為 6.5V；使用的電流計，內部電阻 r_m 為 15Ω ，測得開口端的電流為 3.75mA。求未知電路的 Thevenin Equivalent Circuit。

Measured $V_{OC}=6.5V$

Measured $I_{SC}=3.75mA$ $r_m=15\Omega$



Network connected for measurement of short-circuit current (practical ammeter)



Network connected for measurement of open-circuit voltage (ideal voltmeter)

The unknown circuit is replaced by its Thevenin equivalent.

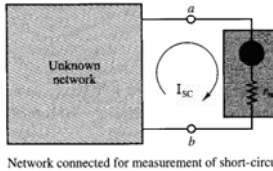
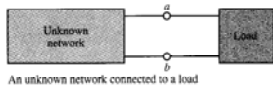
$$E_{TH} = V_{OC} = 6.5V$$

$$I_N = I_{SC} \left(1 + \frac{r_m}{R_{TH}} \right)$$

$$R_{TH} = \frac{E_{TH}}{I_N} = \frac{V_{OC}}{I_{SC}} - r_m$$

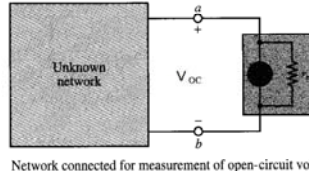
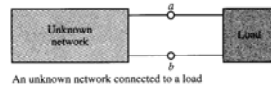
補充資料

Experimental Determination of Thevenin and Norton Equivalents



$$I_N = I_{SC} \left(1 + \frac{r_m}{R_{TH}} \right)$$

Experimental Determination of Thevenin and Norton Equivalents



$$E_{TH} = V_{OC} \left(1 + \frac{R_{TH}}{r_m} \right)$$

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