

南台科技大學 101 學年度研究所考試入學招生考試

系組： 電機系乙組、電機系海外

准考證號碼：

科目： 電路學

(請考生自行填寫)

注意事項	一、請先檢查准考證號碼、報考系(組)別、考試科目名稱，確定無誤後再作答。 二、所有答案應寫於答案紙上，否則不予計分。 三、作答時應依試題題號，依序由上而下書寫，作答及未作答之題號均應抄寫。
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1. (a) Use the node-voltage method to find v_o in the circuit in Fig. 1. (10%)
 (b) Find the power developed by the 40 mA current source in the circuit in Fig. 1. (10%)

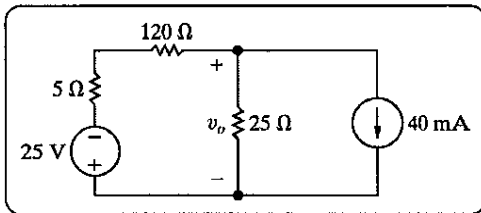


Figure 1

2. Find the Thévenin equivalent with respect to the terminals a, b for the circuit in Fig. 2. (20%)

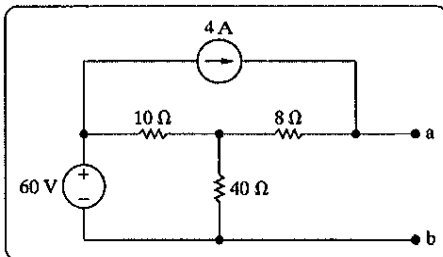


Figure 2

3. The op amp in the circuit shown in Fig.3 is ideal.
 - (a) Calculate v_o when v_g equals 4 V. (10%)
 - (b) Assume that v_g equals 2 V and that the 63 kΩ resistor is replaced with a variable resistor. What value of the variable resistor will cause the op amp to saturate? (10%)

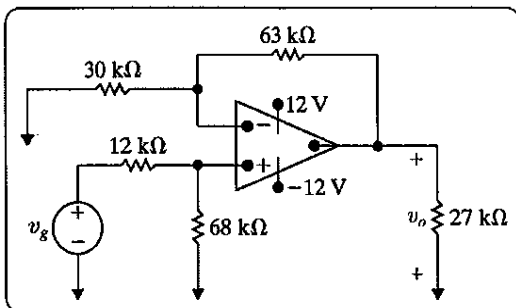


Figure 3

4. The switch in the circuit in Fig. 4 has been open for a long time before closing at $t = 0$. Find $v_o(t)$ for $t \geq 0$. (20%)

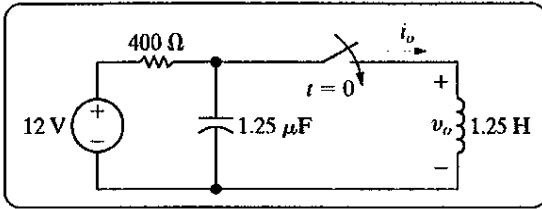


Figure 4

5. The circuit shown in Fig.5 is operating in the sinusoidal steady state. Find the value of ω if $i_o = 100 \sin(\omega t + 173.13^\circ)$ mA
 $v_g = 500 \cos(\omega t + 30^\circ)$ mA (20%)

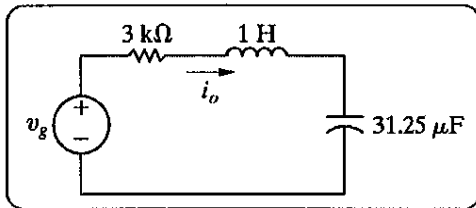


Figure 5