Name : _____ Section:_____ CWRU e-mail:_____

CASE WESTERN RESERVE UNIVERSITY
Case School of Engineering
Department of Electrical Engineering and Computer Science
ENGR 210. Introduction to Circuits and Instruments (4)

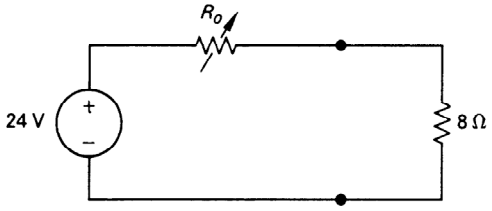
Quiz No. 6 **2/25/05**

PUT ANSWERS IN THE SPACE PROVIDED AND SHOW YOUR WORK IF APPROPRIATE. BE SURE TO STATE ANY ASSUMPTIONS

MAXIMUM SIGNAL TRANSFER

Problem 1 (10 points)

(a) Find the value of the variable resistor Ro in the circuit below that will result in maximum power dissipation in the 8-Ω load resistor.



(b) What is the maximum power that can be delivered to the 8-Ω load resistor.

(c) If R_o increases from 10Ω to 25Ω, the power dissipated by the 8Ω load will (circle one)

(i) increase

(ii) remain the same

(iii) decrease.

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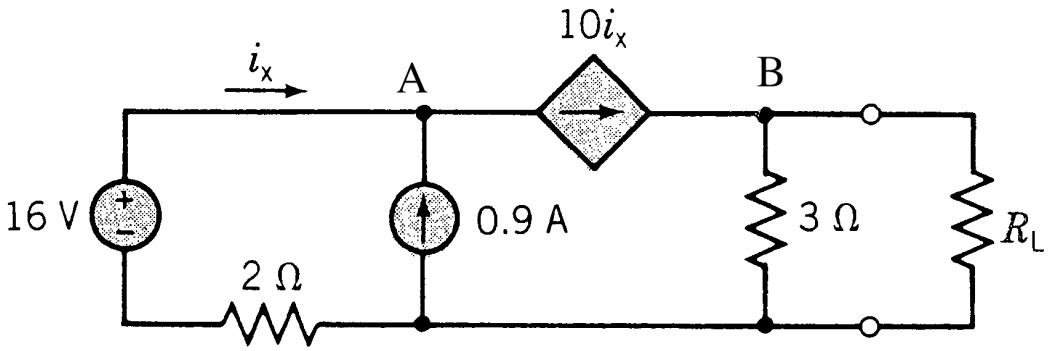
LINEAR DEPENDENT SOURCES

Problem 2 (10 points)

Consider this active circuit with a dependent source. Assume $R_L=6\Omega$



a) Write node analysis equations (KCL) for nodes A and B in terms of i_x and the given circuit parameters. These are the connection equations. Do not write i_x in terms of other circuit variables for this part of your answer.

Node	Node-Voltage Equation		
A	$\cdot v_A$	$+\cdot$ $\cdot v_B$	=
B	$\cdot v_A$	$+\cdot$ $\cdot v_B$	=

b) Now write an expression for i_x in terms of V_A, V_B and the given circuit parameters. (This is a constraint equation.)

c) Using your equations from parts (a) and (b) determine the node voltages for the above circuit values.

V_A		V_B	