**Fill out information below and attach this cover sheet to the FRONT of your HW.**
**If you do not (or enter incorrect information) you WILL loose 10 points on the HW.**

**NAME:_____**
**SID #:_____**
**Circle One: EE42 / EE100**
**If EE100, Lab Day:_____,Time:_____**

# EE 100

## Homework # 6

L. Chua Fall 2008

Issued : Oct. 3 Due : Oct. 10

1. Problem 5.2 p.176

2. Problem 5.5 p.176

3. (a) Apply *load line analysis* to find the *operating point* voltage $v_D$ of the ideal diode circuit in Fig.1 with $v_i$ = 10 V. Show your graphical constructions.

(b) Apply *load line analysis* to find the *operating point* current $i_D$ of the ideal diode circuit in Fig.2 with $v_i$ = 5 V. Show your graphical constructions.

(c) Derive and sketch the *transfer characteristic plot* (TC plot) of the *ideal diode* circuits shown in Figs. 1 and 2.

(d) Sketch the output voltage $v_o(t)$ of Figs. 1 and 2 with $v_i(t) = 30\ sin\ t$ volts.

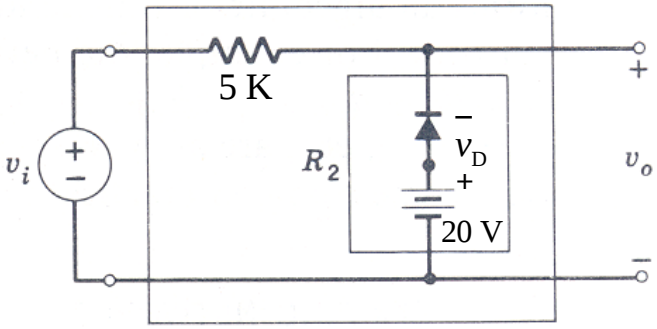


Fig. 1

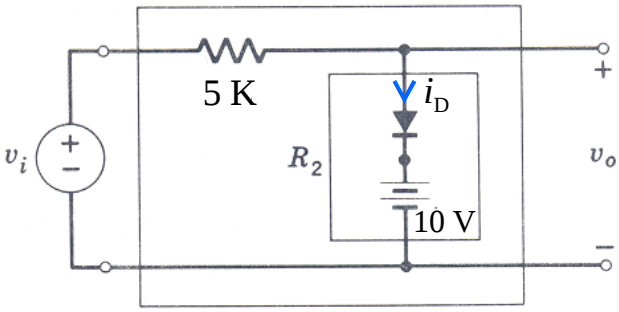


Fig. 2

4. (*a*) Assuming the nonlinear ideal op-amp model with $E_{sat} = 15$ V, derive and sketch the driving-point characteristic for the one-port shown in Fig. P4.14.

(*b*) Connect a linear resistor $R_1$ across the one-port, and find the maximum value of the resistance for which the one-port functions as an independent current source.

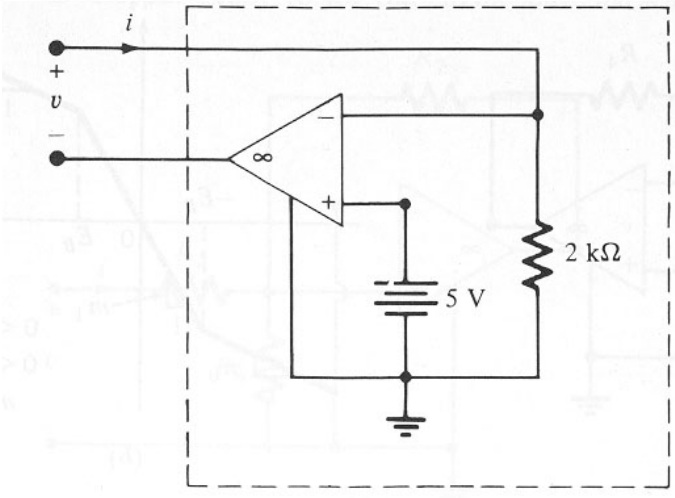


**Figure P4.14**