

Name: _____

Student ID #: _____

**EECS170A
Homework #4**

**HW will be collected in DISCUSSION Or TA OFFICE HOURS.
Homeworks will not be accepted in Professor's office.
Do not turn your HW in anywhere else, or it will not be accepted.
Note: Kim has office hours Mondays 2-3:30 pm in ET 124.
Due MONDAY November 22, 2004 AT 3:30 pm.**

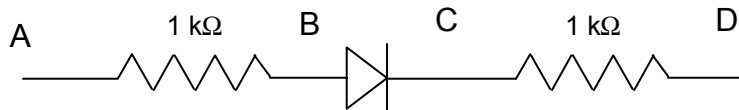
Please *staple* this sheet to the front of your homework.

1	2a	2b	2c	2d	2e	2f	2g	2h	2i	2j	Total
/42	/6	/6	/6	/6	/6	/6	/6	/6	/6	/4	/100

1) In class we found:

$$I = I_0 \left(e^{qV_{diode}/kT} - 1 \right)$$

Take $I_0 = 10^{-14}$ A. For the circuit shown, fill in the following table:

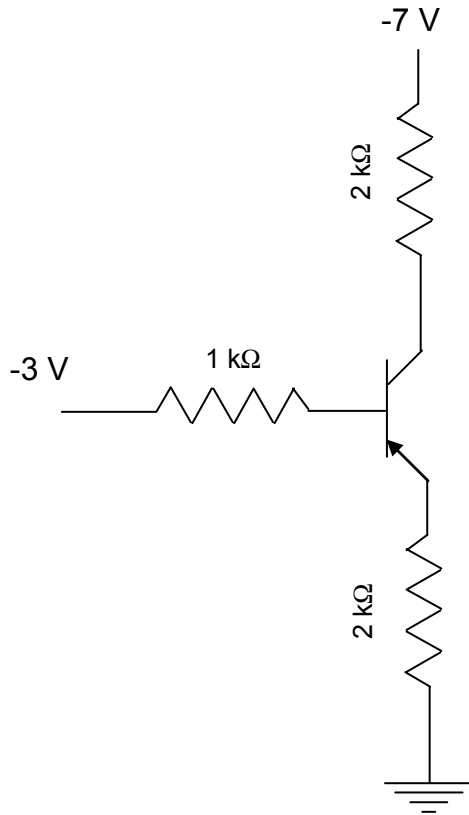


V_{AD} (V)	V_{diode} (V) = V_{BC}	I_{AD} (A)
0		
0.5		
1		
1.5		
2		
2.5		
3		
3.5		
4		
4.5		
5		
5.5		
6		
6.5		
7		
7.5		
8		
8.5		
9		
9.5		
10		

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- 2) For the circuit shown below, find I_B , I_E , I_C , V_C , V_B , V_E , V_{BE} , V_{CE} , V_{BC} defined in figure 10.2 (which one, a or b?) of the text. Hints: the BE voltage drop is about 0.6 V. Take $\beta = 100$. Then $I_C = 100 I_B$. The rest is just applications of Kirchoff's current and voltage laws. Is the transistor biased in active mode?



Please fill out table on this paper. Show your work on attached paper. As usual, no units, no credit.

$I_E =$	
$I_B =$	
$I_C =$	
$V_E =$	
$V_B =$	
$V_C =$	
$V_{BE} =$	
$V_{CE} =$	
$V_{BC} =$	
Active? Y or N	