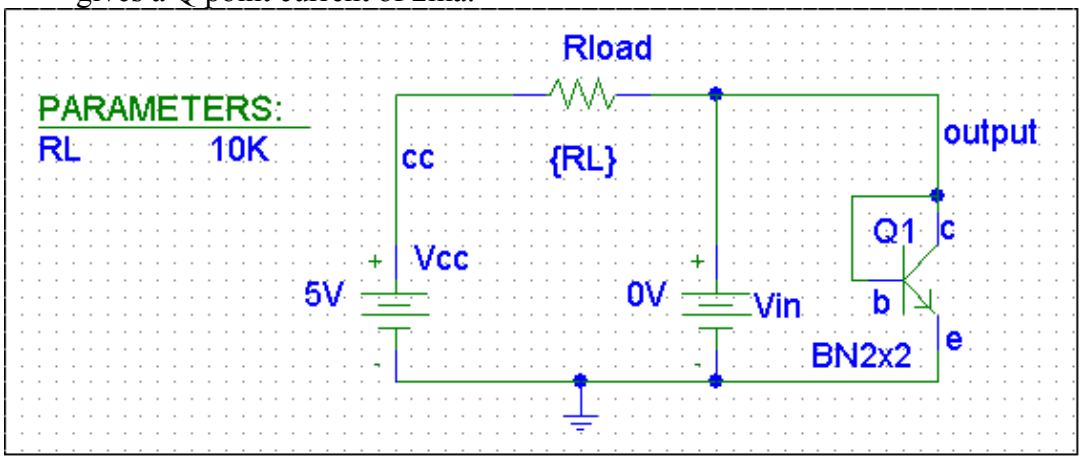
File: E:/courses/spring2006/303/hmwrk1.doc RWN 01/30/06b-02/06/06
Homework Set 1 due ~~Monday February 6, 2006~~ Wednesday 02/08/06
If not yet done, download the bicmos12 files to use in your Spice program. For grading purposes submit your circuit diagrams and typical probe plots.

1. [35 points] In Spice set up a circuit which will simultaneously generate a plet of the dc diode anode current versus the diode voltage for each of the following:
   a) Dbreak (in breakout library)
   b) d_body of the 4007 (=RCA36000) CMOS model (in Spice file ANL_MISC.lib)
   c) the BN2X4 npn BJT in the library bicmos12 when the collector is connected to the base
   d) the BN2X4 npn BJT in the library bicmos12 when the emitter is connected to the base

2. [30 points] For the following circuit find by using Spice the value of Rload which gives a Q point current of 2ma.



3. [35 points] Set up the following circuit in Spice using mnmosis and mpmosis transistors (in the bicmos12 library) and then do dc runs where Vin varies between Vss and Vdd.
   a) plot ID(M4) versus Vin
   b) for the same data as in a) plot ID(M4) versus ID(M3)
   c) plot Vout and Vmid vs Vin
   d) in the dc run add a parametric variation of W2 between 10u and 50u in 20u steps and repeat a)