

1. (50 points, BJT curves)

Run simultaneous DC curves for the BJT 2N3904 & 2N3906 of IC versus VCE for the npn and VEC for the pnp with IB as a parameter to get curves of the type of Figure 6.19 of p. 375.

For this you can use one current source Iin for the base currents into two F components with their outputs being IB for the two transistors (note the negative sign on the pnp IB). And one voltage source Vbias for the collector – emitter voltages.

Submit these curves for $0 \leq V_{bias} \leq 5V$ in 0.1V steps nested with $0 \leq I_{in} \leq 100\mu A$ in 25uA steps.

2. (50 points, transient transistor sinusoidal analysis)

Use the mnmosis transistor from the bicmos12 set. [This can be found by downloading from the course web page the transistor files bicmos12.olb and bicmos12.lib (or for PSpice 8 the two equivalent files bicmos12.slb & bicmos12.lib). These files may already be installed but if not install them on the computers or folders from which you will run Spice]. Also use a Vsin source.

- a) For the following circuit do a transient analysis over 3mS with a time step limit of 0.003mS and plot the voltage at the gate and the drain of the transistor versus time. Use the default value of the parameter.
- b) Repeat part a) but via a parametric run on R using three values for the load resistor: 10, 1k and 1Meg. Label with text in the plot the range of R.
- c) Repeat part a) but via a parametric run using Ld=3u, 30m, 300m

