JEE2330 – Spring 2025
Lab #6 Values and Notes

Experimental Procedure:

6.4.1 Set the transistor curve tracer menu as follows: **Type** = npn; $\mathbf{V_{CEmax}}$ = 20 V; $\mathbf{I_{cmax}}$ = 10 mA; $\mathbf{I_{B/step}}$ = 5 μA; **Steps** = 10; $\mathbf{R_{Load}}$ = 0.25 Ω; and $\mathbf{P_{max}}$ = 0.1 W.

a) Use V_{CC} = 12 V and R_C = 1.2 kΩ.

6.4.2 Use a ¼ Watt, 1.2 kΩ ±5% resistor for R_C. Be sure to measure its resistance before inserting it into the circuit. Note that it is easy to supply too much base current and overdrive the transistor, which will either burn it out or alter its characteristics. With V_{CC} set to the proper voltage and the **decade box set at 999,999 Ω** as specified in the manual, slowly reduce R_{DB} until the BJT is biased at the proper V_{CEQ} voltage. ***Note that if you don't follow these instructions and burn up your transistor, you will have to start the whole experiment over, so be careful.*** Be sure to let the transistor reach temperature equilibrium before taking data after making any change.

6.4.3 Use ±5 μA changes in I_B instead of ±20% changes.

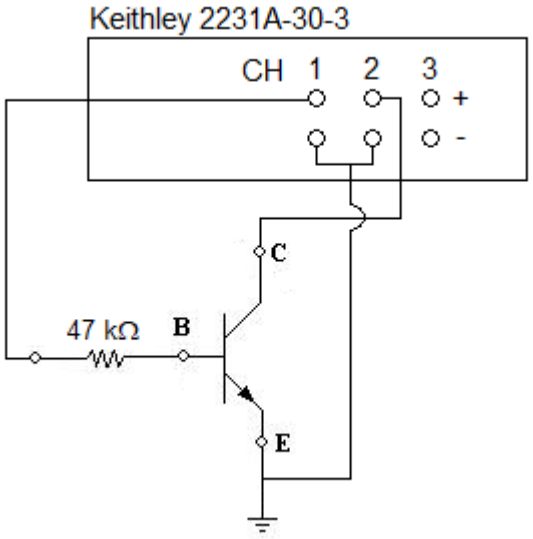
6.4.4 Skip this part of the experiment.

Report Grading:

Data Sheets:	10 points
Section 6.5.1:	14 points
Section 6.5.2:	18 points
Section 6.5.3:	8 points
Section 6.5.4:	6 points
Section 6.5.5:	8 points
Section 6.5.6:	16 points
Section 6.5.7:	10 points
Section 6.5.8:	Skip this part
Section 6.5.9:	10 points

LabView Curve Tracer:

This is an alternative to the Tektronix Curve Tracer discussed above. Build the following circuit using your transistor. Turn on the power supply, but do not set any of the voltages.



In the Modules section of the course Canvas page, download and run "CurveTracer Using Keithley 2231A-30-3.exe". The executable will automatically step through a series of base currents from 5 μA to 50 μA and vary the collector-emitter voltage for each one from 0 to 20 V. Building the entire set of characteristic curves takes about 4 minutes (though printing is much faster than the dot matrix printer). If needed, the base current per step and maximum base current can be adjusted.