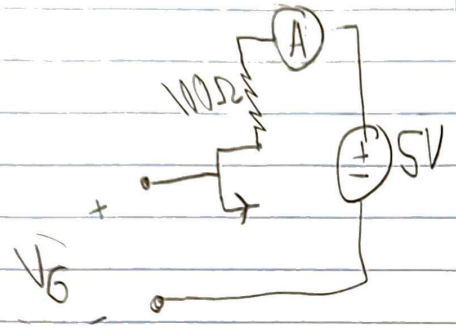
E40 Regis

Julian Robin

Jaime Van-Perez

1.2.2



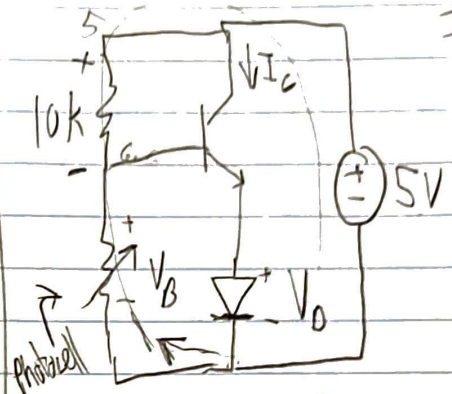
Threshold V_G = 2.8V

V_G	I
2.8	0.00
3.1	0.12
3.4	3.625
3.7	17.9
4.0	48.6
4.3	49.4
4.6	49.76
4.9	49.9

1.4.1

Measured: 1.775k + 8.092k

= 9.867k



R_B = 5k, 20k

$I_B = \frac{5}{10k + R_B}$ → $\frac{1}{3}$ mA, $\frac{1}{6}$ mA

$V_B + 10k I_B - 5 = 0$

$V_B = 5 - 10k I_B$

5k: $V_B = 5 - 10k(\frac{1}{3}mA) = 2.667V$

$V_B = 5 - 10k(\frac{1}{6}mA) = 4.333V$

2.23

$V_D = 0.0183V$

$V_J = 2.23V$

1.2.2: Dependent Sources and MOSFETs (55 points total)

1. Diagram of circuit, including measured resistance value. (5 pts)

   97.53Ω

2. What MOSFET threshold voltage. (10 pts)

   2.8V

3. Attach to this worksheet a table providing your measured gate-to-source voltage vs. drain current values and a plot of data. (15 pts)

4. What type of dependent source is the transistor behaving like? Why? (5 pts)

   Voltage dependent current source since the mosphet activates when the voltage is sufficient.

5. Estimated value of *g* for circuit. Annotate the plot attached to this worksheet, indicating how the value of g was determined. (10 pts)

   g is Approximately 2.8.

6. **DEMO**: Have a teaching assistant initial this sheet, indicating that they have observed your circuits' operation. (10 pts)

   TA Initials: _____