The instructions for EE 248-5 Breakdown Diodes will be as given below. Because of time constraints, you will only investigate one zener diode circuit, and study its regulation capabilities. See Jaeger Section 3.11 for reference. This study will emphasize the voltage regulation capabilities required in DC power supplies. Construct the circuit given below.

a) For a load resistance of 1 Kohm, record measurements of the load voltage Vo as Vs is varied from 8 volts to 16 volts, and then plot the results.

b) For a value of Vs of 15 volts, record the measurements of the load voltage Vo as the load resistance is varied from 500 to 15 K ohms, and then plot the results. Calculate the percent voltage regulation which can be estimated by calculating

\[ \text{% voltage regulation} = \left\{ \frac{(V_0)_{\text{max}} - (V_0)_{\text{min}}}{(V_0)_{\text{max}}} \right\} \times 100 \]

c) If time permits, construct the circuit in Figure 3 and perform procedure 5 in the manual.

d) Again if time permits, use procedure 9 of EE 248-3 to display the breakdown characteristics on the oscilloscope, and obtain a printout of the display.

\[
\begin{align*}
1/2W & \\
330 & \\
V_0 & \\
\end{align*}
\]

\[
\begin{array}{c}
\text{Data: IN-4735} \\
V_z = 6.2 \text{ V} \\
I_z = 41 \text{ mA} \\
\text{Maximum dynamic impedance } @ \ I_z = 2.5 \Omega \\
\text{Dissipation } = 1 \text{ W} \\
\text{Typical Tempco } @ \ I_z = 2.5 \text{ mV/V} \\
\text{Typical knee current } I_{zk} = 1 \text{ mA}
\end{array}
\]