**Experiment #11-Prelab ENEE2103**

**Zener Diodes and Voltage Regulators**

**Pre-lab Work:**

You have to apply PSPICE simulation to all practical circuits shown in the procedure below, and you have to do all necessary calculation you will need in the lab.

**Procedure:**

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***PROCEDURE:***

***I.ZENER DIODE.***

## Connect the circuit shown in Fig (11-1). And perform dc sweep of V1 from 0-15V and plot voltage Vo and Iz



1. Connect the circuit of Fig (11.2) and repeat part 1



1. Connect the circuit shown in Fig(11-3). With same zener



1. Perform dc sweep for E with values from 10-14 and plot voltage across RL
2. Set E=10V and Perform dc sweep of RL for the following =(8.2K,6.8K,4.7K,2.2K) and plot VL

***II. THE VOLTAGE REGULATED POWER SUPPLY.***

1. Connect the following voltage regulator circuit and perform bias point analysis , find Vo and Vz ? how they are related to each other



1. Attach a 1k load resistor to the output and repeat the bias point simulation and display Io and Vo?
2. Repeat step 2 for load resistance RL = (680 , 470 , 220 , 100) ohm, you can perform dc sweep of RL and plot Vo and Io
3. Set RL back to 1K .Change the value of R2 to 470 ohm. Perform bias point analysis and display the new Vo? How it is related to Vz?.
4. Change R2 to 2.2k. What is the output voltage now?
5. Connect the circuit shown in Fig.(11-5).



1. What is the value of Vo?
2. Repeat steps 3 and 4 . and record your results .

# IV. THE 555 TIMER CHIP AS AN ASTABLE MULTIVIBRATOR.

* 1. Connect the circuit shown in Fig.(11-8). And perform transient analysis for suitable duration (end time)



* 1. Display Vo and measure duty cycle for R2 =10k and 50k.
  2. Sketch Vc(t) connected to terminal 6 for different values of R2.

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