

EE-100 Lab Prelab: **Astable, Monostable, and Bistable op amp circuits**

Name: \_\_\_\_\_

TA: \_\_\_\_\_

Section: \_\_\_\_\_

1. Give examples for oscillation from your everyday experiences (electricity, mechanics, biology, physics, natural phenomena, etc.).
2. What are the Thévenin / Norton equivalent circuit models of a capacitor and an inductor for purpose of transient analysis? A) to solve initial condition (opening or closing a switch), B) for steady-state solution (DC solution).
3. Determine the slope of the linear region of a negative resistance converter with parameter values of the first measurement. What is the maximum current in the linear region if  $E_{sat}$  equals to 12 V?
4. Connecting a capacitor across the input of the negative resistance converter produces an oscillatory circuit. Does this circuit work in the linear region, in the saturation region, or in both of them?
5. What is the maximum current flowing through the capacitor? ( $R_A$ ,  $R_B$ ,  $R_f$  are 10k, 10k, and 4.3k, respectively, and  $E_{sat}$  is 12V.) Does it depend on the value of the capacitor? (Figure 3 can help).