American University of Beirut

Department of Electrical and Computer Engineering

EECE 310 – Electronics Fall 2011 – 2012

*Due Wednesday October 12, 2011 at 9:00 am*

**Homework 2**

**1.** **[10 points]** A junction diode operating at a temperature of 37 degrees C is conducting a current of 0.33 mA, and has *n* = 1.2.

(a) **[5 points]** What is the value of *I*S for this diode if the diode voltage is 0.777 V?

(b) **[5 points]** What is the *change* in the diode voltage if the current increases by a factor of 1000?

**2.** **[60 points]** Find the operating point (*I*D, *V*D) for the diodes in the circuits shown below. Assume that all the diodes are *ideal*. **[5 points for the ID value per diode, 5 points for the VD value per diode].**



**3. [30 points]**

a. **[10 points]** Assume that the diode in the circuit below is *ideal*. Find the operating point (*I*D, *V*D) of the diode. *Hint*: Use the Thévenin equivalent circuit.



b. Repeat part (a) for a real diode at a temperature of 27 degrees C with *n* = 1.2 and

*I*S = 10-14 A, using:

 i. **[10 points]** Iterations with an initial guess for *I*D equal to the value found in part (a)

 ii. **[10 points]** The graphical load line method.