


Faculty of Engineering – Shoubra Department: Electrical Eng. Semester: Spring 2013	 Mid Term Exam	Course: ECE 121 Electronics (I) Instructor: Dr. Abdallah Hammad
Total Grade: 25	Mid Term Exam	Number of questions: 5 - Time allowed: 90 Min

(1) The Zener diode in the voltage regulator circuit shown has $V_Z=18.6\text{ V}$, $I_{Z\text{min}} = 15\text{mA}$. If $V_b = 24\pm 3\text{ V}$ and R_L varies from $250\ \Omega$ to $2\text{ k}\Omega$.

- a) **Find** the maximum value of R_S to maintain regulation.
- b) **Specify** the maximum power rating of the Zener diode.

(2)

- a) **Drive** an expression for the **PIV** for a diode in a full wave bridge rectifier.
- b) **How do** you protect the LED against the reverse voltage?

(3) **Explain** briefly the double clipping circuit shown in figure, then **draw** the transfer function (assume $V_D = 0.7\text{ V}$).

(4) For the diode circuit shown in the adjacent figure: (assume that the forward voltage drop of the diode is 0.7 V). **Calculate** the currents I_1, I_2, I_3 and I_4 .

