

***EGR326 F'09***

***Exam #1***

***Grading Key***

1. A flyback converter uses a transformer, not an inductor.
2. The controller needs some sort of power supply input.
3. Lab #2 illustrated that case temperature increases **linearly** with power dissipation.
4. Strangest-looking graph I've ever seen. See solutions.
5. This is exactly backwards.
6. More goes on than "the zener doesn't work". The resistor now is essentially acting as a (poor) voltage regulator thus the voltage drop will be linear with current.
7. The load current doesn't go through  $R_1$ , it goes to the load! Your  $R_1$  is going to be very low and draw too much (unnecesssary) current.
8. You haven't considered that the zener diode needs 5mA of current, and this won't be available beyond some load current (see solutions).
9. The microcontroller needs to sense the output voltage in order to keep the circuit in regulation.
10. I see a lot of random stuff here but no real coherent explanation.
11. No, at no load  $I_{in} = 15.8\text{mA}$ . That is always going to be constant regardless of load, as long as the input voltage is constant.
12. This is a buck converter topology, not a boost converter (and definitely not a flyback).
13. The diode current flows when the inductor current is decaying, not increasing.