Sample Exam Part 2 Solution

Here are a few dc-dc converter related questions:

1. You are given a buck converter. You measure the input voltage to be 15 V from a 100W source, and have an output current of 4 A. Assuming no power losses determine: average input current, output voltage, duty ratio. The filter inductance is 100 μH and the switching frequency is 10 kHz. Will this converter be in continuous conduction. If not suggest two options to move it to continuous conduction.

2. Short Answer:

A. Why is it important to always provide an alternate current path when opening a switch in series with an inductor? What happens if you don't?

B. Why isn't the current through the inductor in the buck converter constant (since the average output current is constant)?