1. Indicate TRUE or FALSE:

(a) Electric current can burn a tissue which is physiologically the same as damage caused by an open flame or other high-temperature sources of heat. **TRUE**

(b) The most significant effect of electric current flow is on the nervous system. **TRUE**

(c) A current of 1A is safe if it passes through the human body. **FALSE 17mA**

(e) A PWM amplifier can theoretically achieve an efficiency of 100%.

2. In the circuit below neither the bird nor the person is shocked. Despite this, the circuit is unsafe and not utilized in practice. Explain why.

**The circuit is not grounded, and if accidentally grounded, it could unpredictably shock someone touching any part of the circuit.**



3. Explain the purpose of using a Ground Fault Interrupter.

**It monitors the difference in current going to and coming back from a device. This allows it to detect if current begins travelling an alternate path (ground) and potentially harming someone.**

4. A power transistor has to safely dissipate 5W in a power amplifier application. The transistor’s thermal resistance from junction to case is 1.5 °C/W. Assuming that the maximum junction and ambient temperatures are 150°C and 50°C, respectively, indicate whether a heat sink is required and if so, obtain the thermal resistance of the heat sink.

**150 – 50 = 1.5 \* P**

**150 – 50 / 1.5 = P = 66.7 W**

**Heat sink is not needed because the existing case can transfer sufficient heat.**

