1. A temperature sensor has a mass of two grams and is made of a material with a specific heat of 1.7 J/g°C. Its initial temperature is 22°C. It is in thermal contact with a much more massive biologic tissue with a thermal resistance of 7 °Cs/J. Draw an electrical equivalent circuit for this measurement and plot the sensor’s temperature as a function of time starting at the time when it first contacts the tissue. How long does it take the sensor to reach a temperature within 0.5 °C of the tissue’s temperature?

2. A simplified shunt ohmmeter circuit is shown below. Complete the design of this circuit by determining the value for $R_s$ such that the meter reads zero for $R_x = 0$, and it reads full-scale when $R_x$ is an open circuit. What resistance value for $R_s$ will cause the meter to read exactly half-scale?