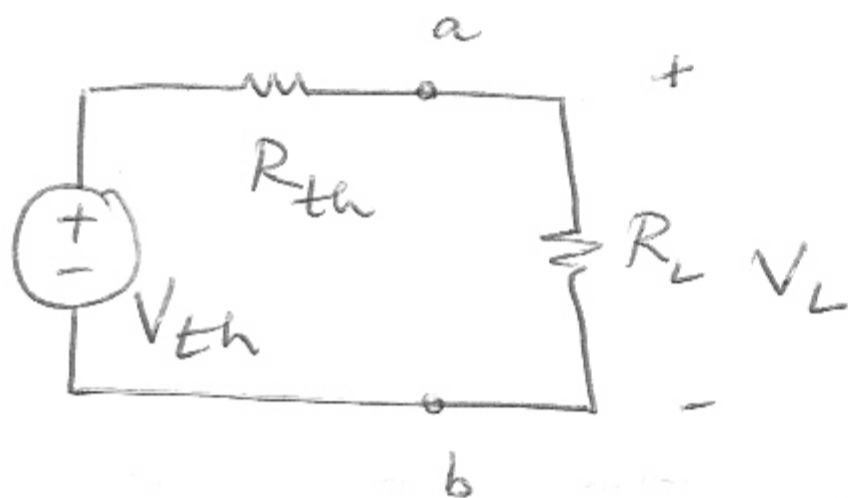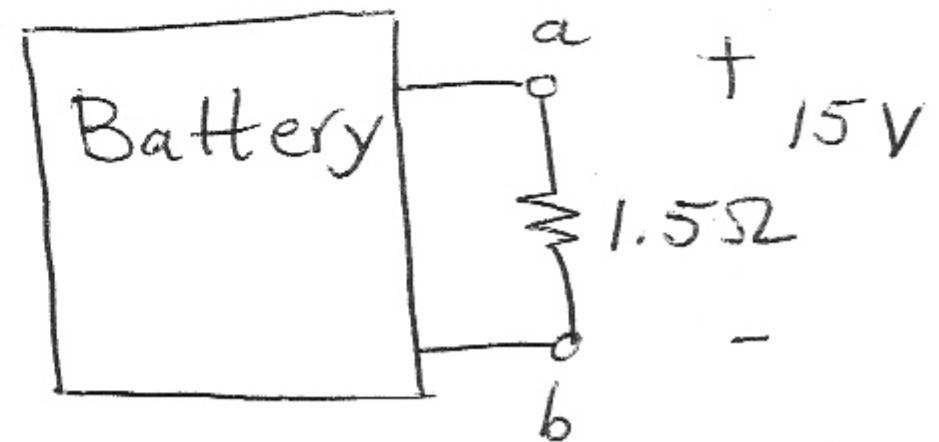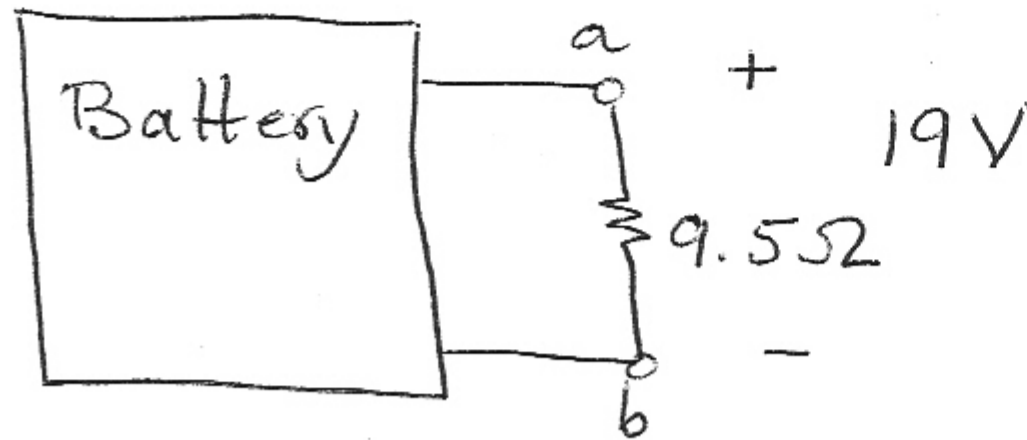Name:

I.D. Number: KEY

Consider a battery with an unknown Thevenin equivalent circuit. When a 9.5Ω load resistor is connected to the battery, the voltage developed across the load equals 19 V. When a 1.5Ω load resistor is connected to the same battery, the voltage developed across the load equals 15 V. Find Thevenin's equivalent circuit of the battery.

$$V_L = \frac{R_L}{R_L + R_{th}} V_{th}$$

$$\therefore \quad 19 = \frac{9.5}{R_{th} + 9.5} V_{th} \quad \textcircled{1}$$

$$15 = \frac{1.5}{R_{th} + 1.5} V_{th} \quad \textcircled{2}$$

solving $\textcircled{1}$ & $\textcircled{2}$ $\implies$ $V_{th} = 20V$

$$R_{th} = 0.5\Omega$$