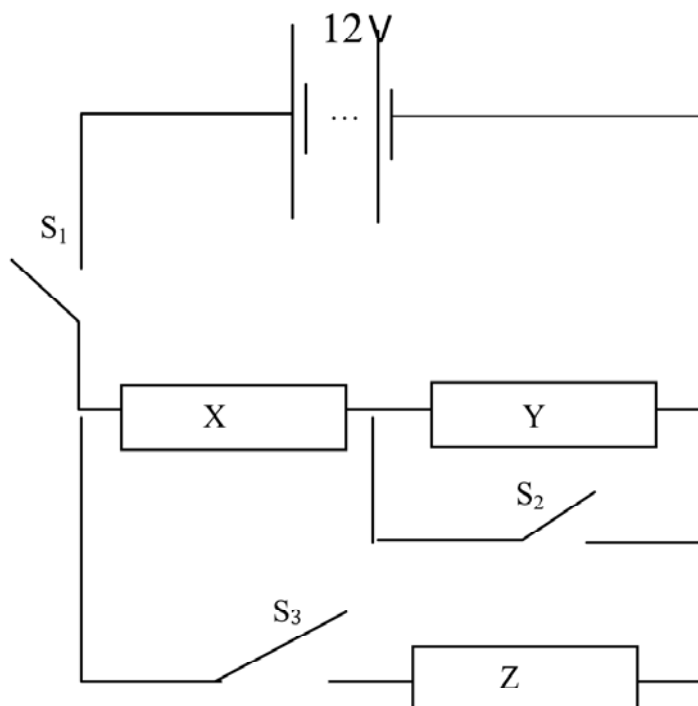


Extension Worksheet – Topic 5, Worksheet 2

- 1 The diagram shows a circuit with a battery of emf \mathcal{E} equal to 12 V and negligible internal resistance. There are three switches in the circuit. Each of the resistors dissipates a power of 24 W when connected to a source of 12 V and the resistance of each resistor may be considered to be constant.

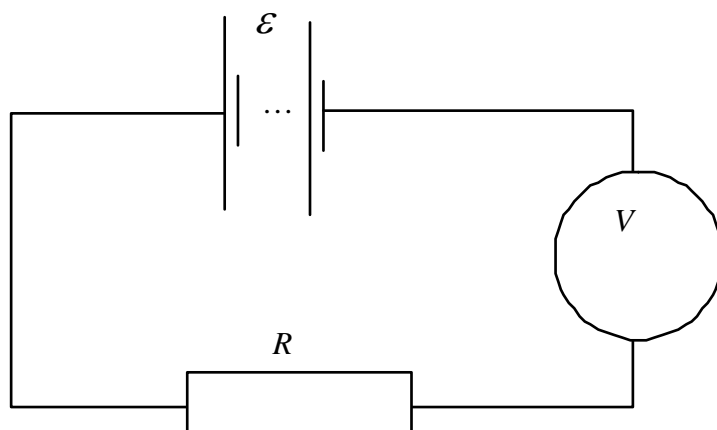


Calculate the power dissipated in the circuit for various positions of the switches by filling in the table below.

S_1	S_2	S_3	Power/W
open	closed	open	
closed	closed	open	
closed	closed	closed	
closed	open	closed	
closed	open	open	

[5]

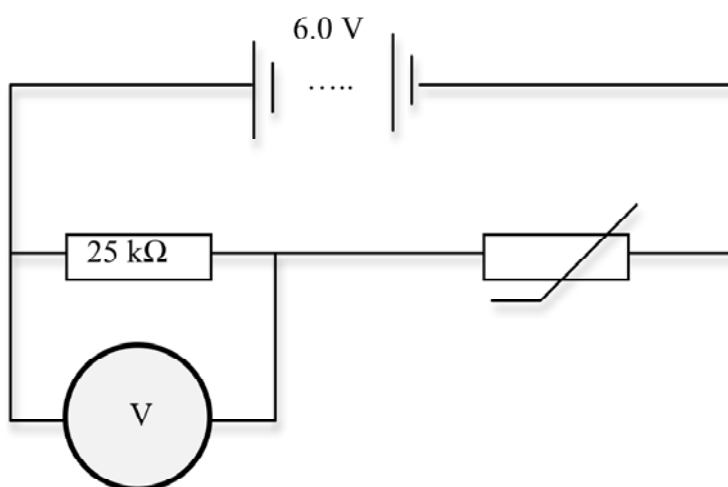
- 2 The diagram shows a circuit with a battery of emf $\mathcal{E} = 6.0 \text{ V}$ and negligible internal resistance.



An ideal voltmeter has been incorrectly connected in the circuit. State and explain the reading of the voltmeter.

[2]

- 3 A battery of emf 6.0 V and negligible internal resistance is connected to a resistor of resistance $25 \text{ k}\Omega$ and a thermistor. At a temperature of 20°C the thermistor's resistance is $25 \text{ k}\Omega$.



- a Calculate the reading of the ideal voltmeter at a thermistor temperature of 20°C .
- b Suggest what will happen to the voltmeter reading when the temperature of the thermistor is increased.

[1]

[3]