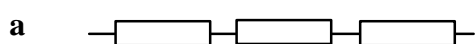
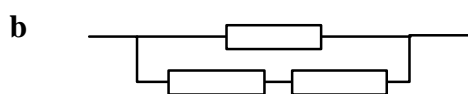


Support Worksheet – Topic 5, Worksheet 1

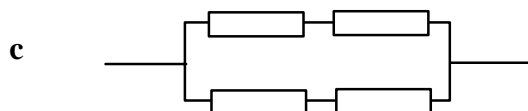
- 1 The potential difference between two points in an electric field is 250 V. Calculate the work that must be performed to move a point charge of 24 mC across these two points. [1]
- 2 The work done in moving a point charge of 1.2 nC through a potential difference is 5.8 mJ. Calculate the magnitude of the potential difference. [1]
- 3 The work done to move an alpha particle across a potential difference is 22 eV. Calculate the magnitude of the work done to move an electron across the same potential difference. [2]
- 4 An electron is accelerated from rest by a potential difference of 120 V. Calculate the speed of the accelerated electron. [3]
- 5 Electrons leave a metal surface at a rate of $6.8 \times 10^{16} \text{ s}^{-1}$. Determine the current leaving the surface. [2]
- 6 Each of the resistors in the parts of a circuit shown is equal to 6.0Ω . Calculate the total resistance of each part of the circuit.



[1]

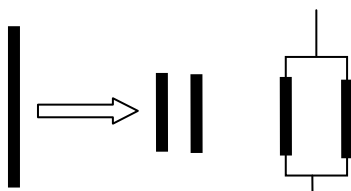


[1]



[1]

- 7 A uniform wire has resistance R . The wire is cut into two equal parts and joined as shown.

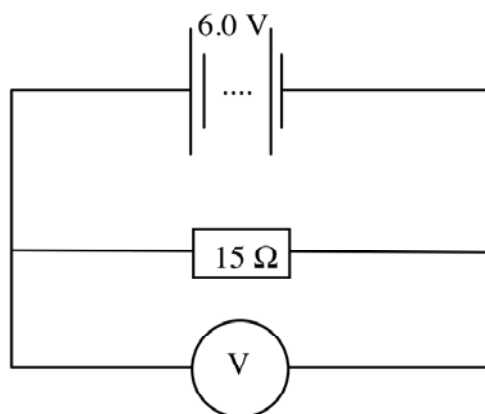


Calculate the resistance of the resulting arrangement.

[2]

- 8 Calculate the resistance of a wire of length 4.5 m whose cross-sectional radius is 0.24 mm. The resistivity of the metal is $2.2 \times 10^{-6} \Omega \text{ m}$. [2]
- 9 A battery of internal resistance 0.80Ω sends a current of 1.5 A through an external resistance. The work required to push one electron through the external resistor is $7.2 \times 10^{-19} \text{ J}$. Calculate the emf of the battery. [3]

- 10** In the circuit below the emf of the battery is 6.0 V. The reading of the voltmeter is 5.4 V.

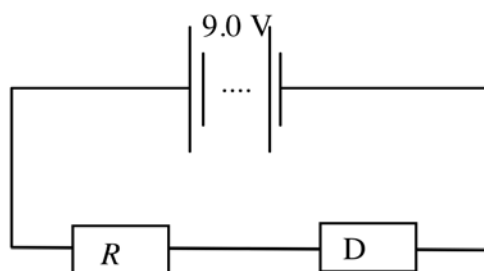


Calculate the internal resistance of the battery.

[3]

- 11** In the circuit below the battery has negligible internal resistance and emf 9.0 V.

The device D operates correctly when the voltage across it is 4.5 V and the current through it 0.15 A. Calculate the value of the resistance R .



[2]