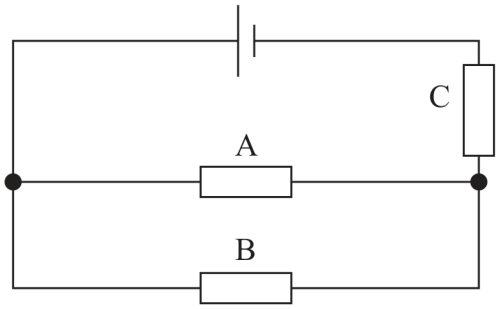
15 The diagram shows a circuit containing three identical resistors, A, B and C. The cell has negligible internal resistance.



*(a) Explain how measurements of current and potential difference could be used to demonstrate that charge and energy are both conserved in this circuit. Your answer should refer to resistors A, B and C.

(6)

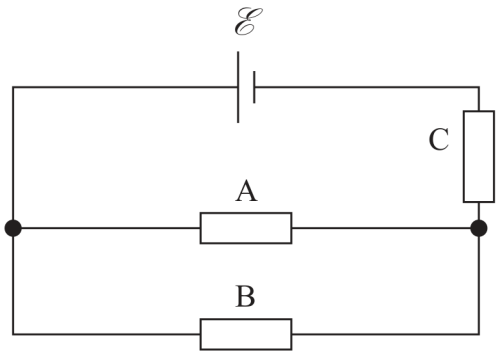
(b) (i) Calculate the total resistance of the circuit.

resistance of each resistor = 12.5 Ω

(3)

Total resistance = ...

(ii) The resistors are connected to a different cell, with e.m.f. $\mathscr{E}$, as shown. The cell has an internal resistance.



Describe how a single ammeter reading can be used to determine the internal resistance of the cell. You should add to the diagram to show the position of this ammeter.

(3)

(Total for Question 15 = 12 marks)