5 **(a)** Define the electromotive force (e.m.f.) of a cell.

.....

.....

.....

..... [2]

(b) A resistor of resistance R is connected to a cell, as shown in Fig. 5.1.

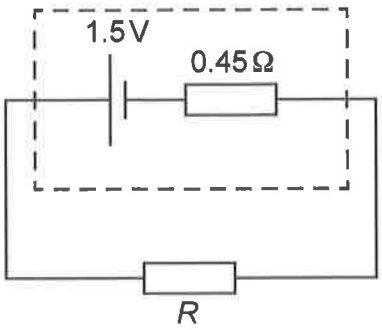

Fig. 5.1

The cell has an e.m.f. of 1.5V and an internal resistance of 0.45Ω.

(i) In a time of 2.4 minutes, 3.5×10^{20} charge carriers pass through a point in the wire.

Calculate the current in the wire.

current = ... A [2]

(ii) Determine R.

R = ... Ω [2]

(iii) Determine the potential difference (p.d.) across the terminals of the cell.

p.d. = ...V [1]

(iv) A second resistor is connected in parallel with the first resistor.

State and explain the change, if any, in the p.d. across the terminals of the cell.

.....

.....

.....

.....

.....

..... [3]

[Total: 10]