Oxford Cambridge and RSA

A level Physics B

H557/02 Scientific literacy in physics

Question Set 14

1 **(a)** **Fig. 1.1** shows a potential divider circuit using cells with very low internal resistance.

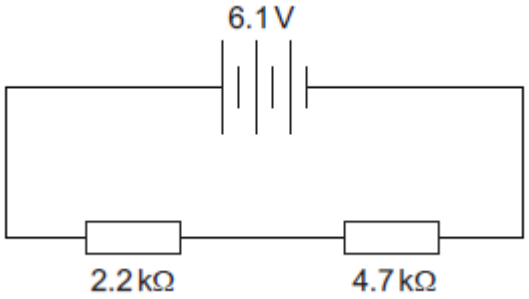

Fig. 1.1

Show that the potential difference across the 4.7 kΩ resistor is 4.2 V to 2 significant figures.

[1]

(b) An analogue voltmeter connected across the 4.7 kΩ resistor reads 3.2 V.

Show that the resistance of the voltmeter is about 5 kΩ.

[3]

(c) A cell is made by inserting a zinc strip and a copper strip into a potato. When the same analogue voltmeter is connected to the cell as shown in **Fig. 1.2**, it registers a potential difference of 0.50 V.

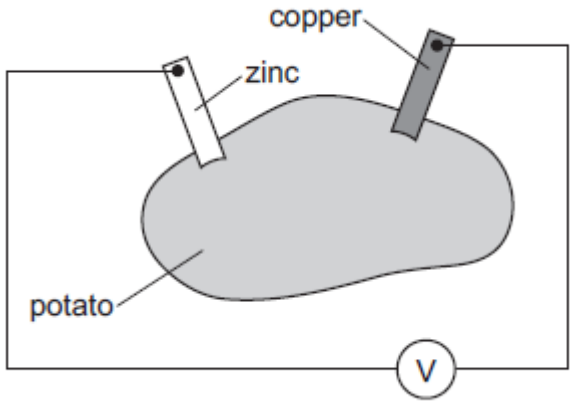

Fig. 1.2

(i) Using your answer to **(b)**, calculate the current in the circuit.

current =……..……...A **[1]**

(c) **(ii)** When a digital voltmeter of resistance 1.0 MΩ replaces the analogue voltmeter in **Fig. 1.2**, it registers a potential difference of 0.93 V. Use the readings from the two meters to calculate an estimate for the internal resistance of the potato, stating any assumptionsyou make.

internal resistance = …… Ω **[3]**

Total Marks for Question Set 14: 8

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