

- 6 (a) Fig. 6.1 shows a uniform wire XY of length 150.0 cm and resistance 4.5  $\Omega$  connected in series with a cell Z of electromotive force (e.m.f.) 3.0 V with internal resistance 0.50  $\Omega$ .

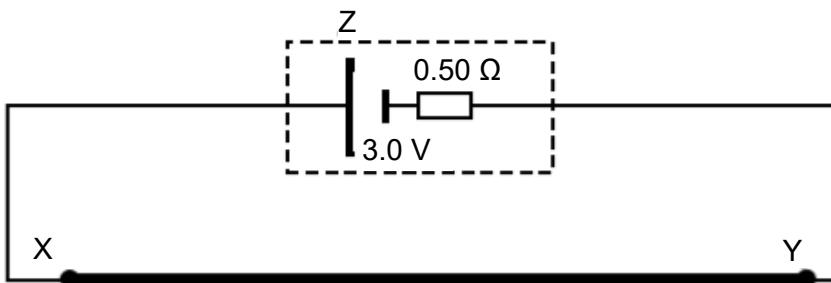


Fig. 6.1

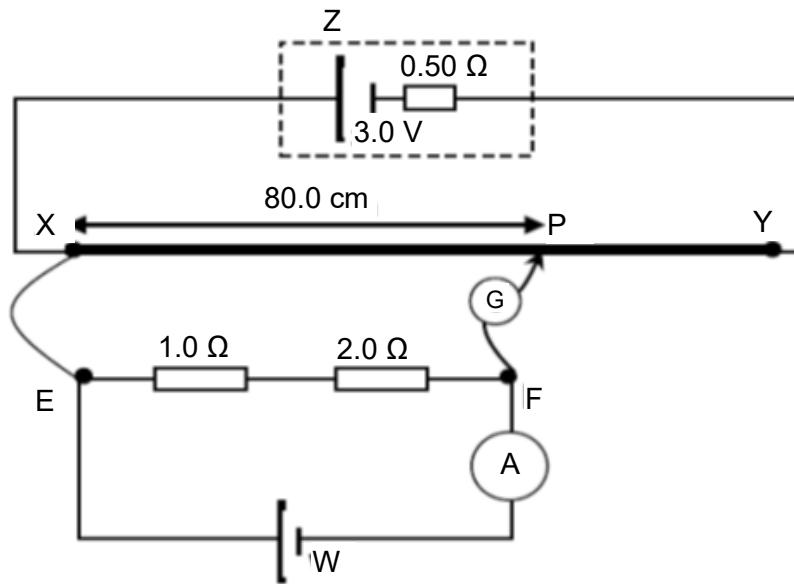
- (i) State what is meant by *electromotive force* of a cell.

.....  
..... [1]

- (ii) Show that the potential difference between X and Y is 2.7 V.

[1]

- (b) Another circuit consisting of a cell W in series with  $1.0\ \Omega$  and  $2.0\ \Omega$  resistors is connected to positions X and P which are  $80.0\text{ cm}$  apart as shown in Fig. 6.2.



**Fig. 6.2 (not drawn to scale)**

If the galvanometer shows null deflection, determine the current reading shown on the ammeter.

current reading = ..... A [2]

- (c) Wire XY is replaced with another wire of the same material and length but with a smaller cross-sectional area.

- (i) State and explain the changes, if any, in the balance length.

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- (ii) Hence with reference to potential difference, explain the changes, if any, of the final ammeter reading at balance

[1]