

- 4 (a) The circuit in Fig. 4.1 contains a battery of electromotive force (e.m.f.) E and negligible internal resistance connected to four resistors R_1 , R_2 , R_3 and R_4 , each of resistance R .

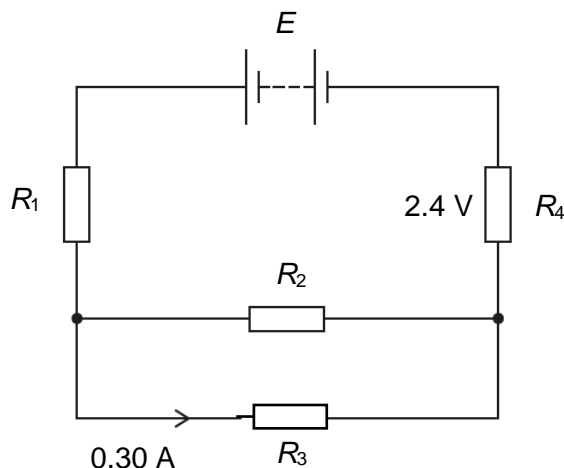


Fig. 4.1

The current in R_3 is 0.30 A and the potential difference across R_4 is 2.4 V.

- (i) Show that R is equal to 4.0 Ω .

[2]

- (ii) Determine the e.m.f. E of the battery.

$$E = \dots\dots\dots \text{ V [2]}$$

- (b) The battery in (a) is replaced with another battery of the same e.m.f. but with an internal resistance that is not negligible.

State and explain the change, if any, in the total power produced by the battery.

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..... [2]

[Total: 6]