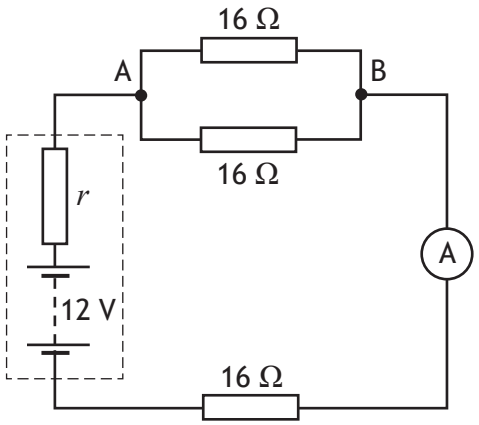
12. A battery has an EMF of 12 V and internal resistance r. The battery is connected in a circuit as shown.



(a) The reading on the ammeter is 0.38 A.

(i) Determine the terminal potential difference (t.p.d.) of the battery. **5**

Space for working and answer

(ii) Calculate the internal resistance r of the battery. **3**

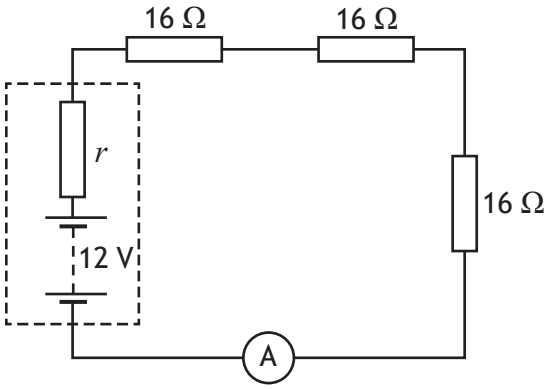
Space for working and answer

12. (a) (continued)

(iii) Calculate the power dissipated by the internal resistance of the battery. **3**

Space for working and answer

(b) The circuit is now rearranged as shown.



State whether the power dissipated by the internal resistance of the battery is greater than, equal to, or less than the value determined in (a) (iii).

You must justify your answer. **2**

[Turn over