

- 5 A cell of electromotive force (e.m.f.) 6.0 V and negligible internal resistance is connected to a resistor of $12\ \Omega$, a resistor of $33\ \Omega$, a resistor R and an ammeter as shown in Fig. 5.1.

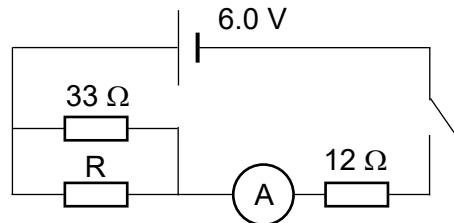


Fig. 5.1

When the switch is closed, the reading on the ammeter is 150 mA.

- (a) Determine the charge Q that passes through the $12\ \Omega$ resistor in a time of 20 minutes.

$$Q = \dots \text{ C} \quad [1]$$

- (b) Calculate the potential difference across the $12\ \Omega$ resistor.

$$\text{potential difference} = \dots \text{ V} \quad [1]$$

- (c) Hence, determine the resistance of the resistor R.

resistance = Ω [3]

- (d) Resistor R is replaced by an NTC thermistor. Initially the resistance of the thermistor is 200 Ω . The switch is closed.

State and explain the change, if any, to the ammeter reading when the temperature of the thermistor increases.

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[2]

