6 A thermistor of resistance R, a fixed resistor and a cell are connected in series in a circuit. A voltmeter is connected in parallel across the resistor, as shown in Fig. 6.1.

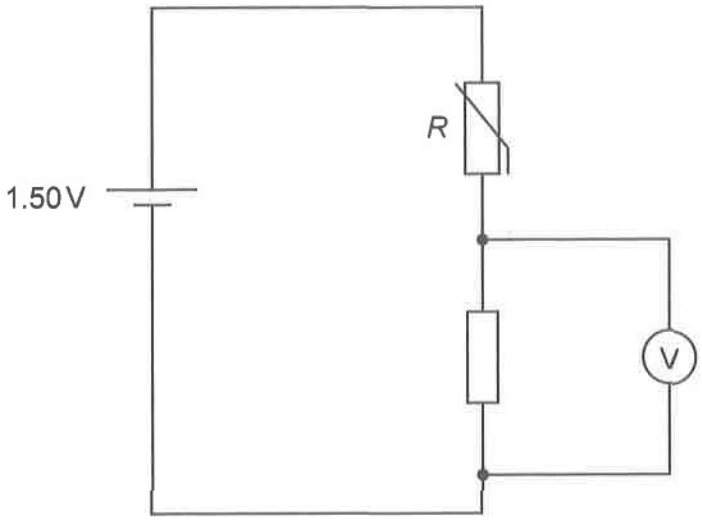

Fig. 6.1

The cell has an e.m.f. of 1.50 V and negligible internal resistance.

The variation with temperature θ of the resistance R of the thermistor is shown in Fig. 6.2.

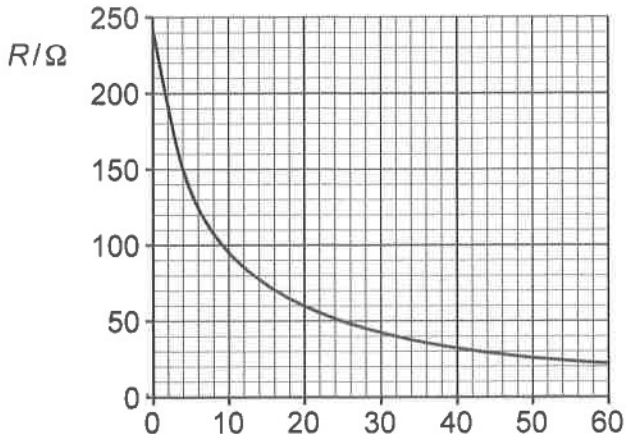

Fig. 6.2

(a) When the thermistor is at a temperature of 20 °C, the reading on the voltmeter is 0.43 V.

Show that the resistance of the fixed resistor is 24 Ω.

[3]

(b) The thermistor and resistor are then connected in parallel with the 1.50 V cell. The temperature of the thermistor is changed to 32 °C.

Determine the current in the cell.

current = ... A [3]

[Total: 6]