3 A thermistor T is connected in series with a resistor of resistance 1.50 kΩ and a battery, as shown in Fig. 3.1.

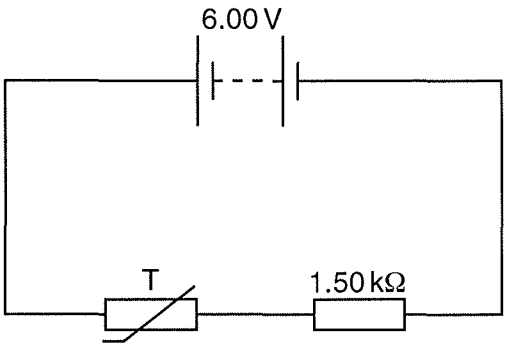

Fig. 3.1

The battery has e.m.f. 6.00 V and negligible internal resistance.
The variation with temperature θ of the resistance R of the thermistor is shown in Fig. 3.2.

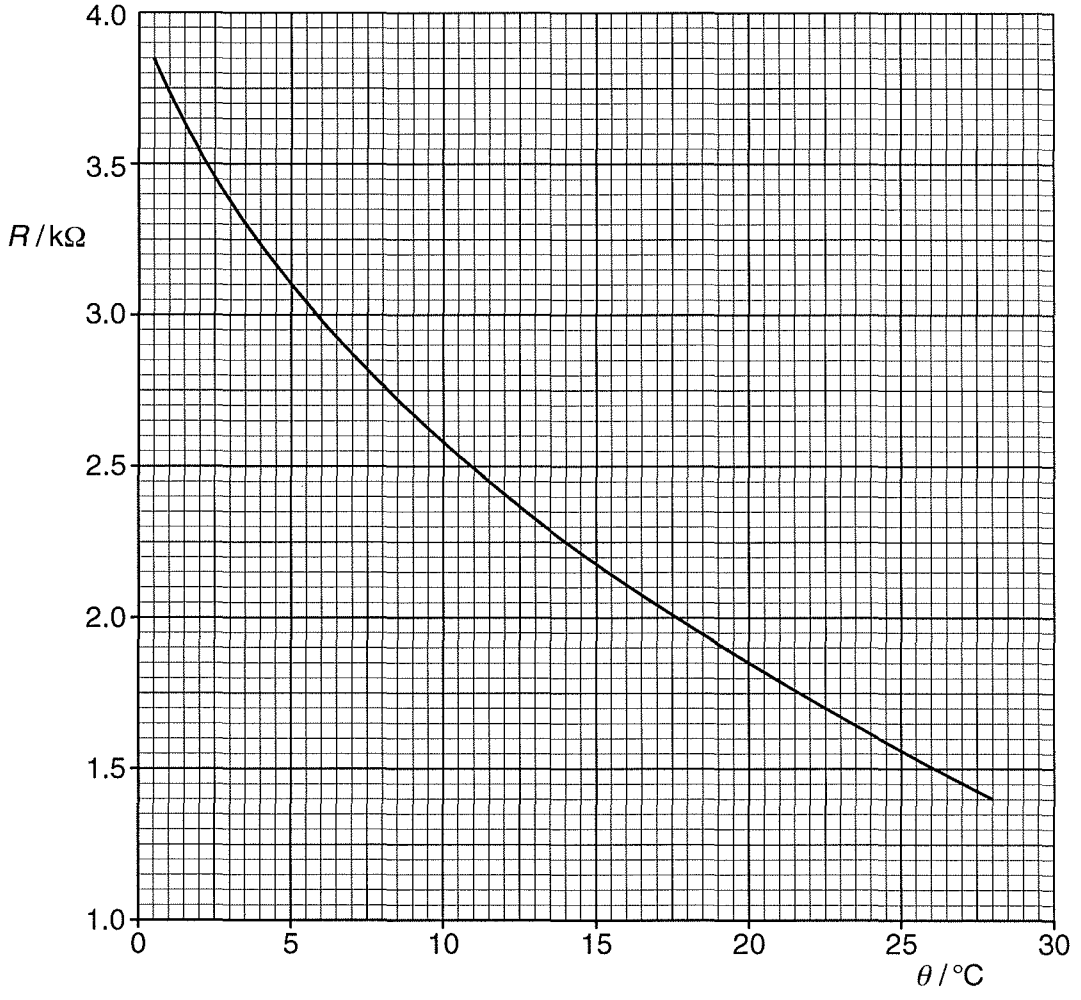

Fig. 3.2

(a) At one temperature t of the thermistor, the current in the circuit is 1.60 mA.
Determine the temperature t.

t = ... °C [4]

(b) In the circuit of Fig. 3.1, the thermistor is provided with cooling fins to dissipate thermal energy. Without this cooling, the thermistor may be affected by 'thermal runaway', resulting in the destruction of the thermistor.
By reference to Fig. 3.2, or otherwise, explain why the thermistor should be kept cool to prevent thermal runaway.

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.....[2]