6 The variation with temperature of the resistance R_T of a thermistor is shown in Fig. 6.1.

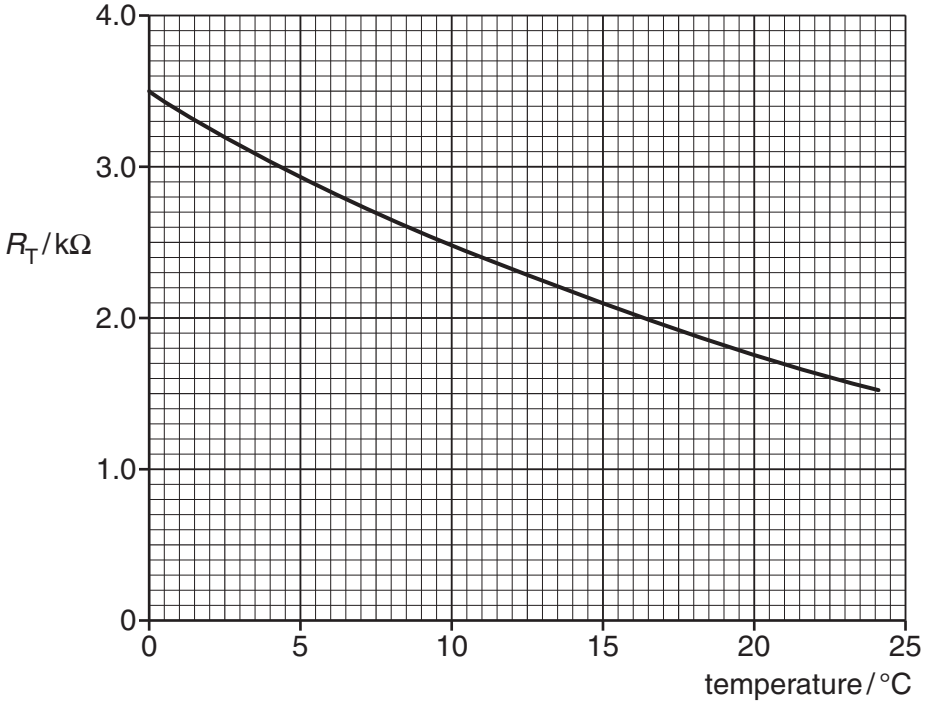

Fig. 6.1

The thermistor is connected into the circuit of Fig. 6.2.

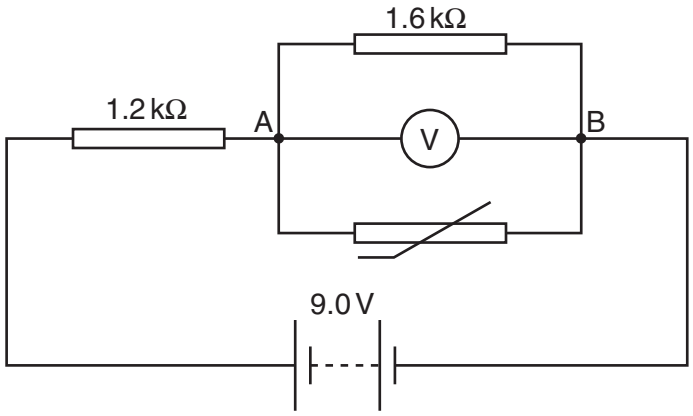

Fig. 6.2

The battery has e.m.f. 9.0 V and negligible internal resistance. The voltmeter has infinite resistance.

(a) the thermistor at 22.5 °C, calculate

(i) the total resistance between points A and B on Fig. 6.2,

resistance = ... Ω [2]

(ii) the reading on the voltmeter.

voltmeter reading = ...V [2]

(b) The temperature of the thermistor is changed. The voltmeter now reads 4.0 V. Determine

(i) the total resistance between points A and B on Fig. 6.2,

resistance = ... Ω [2]

(ii) the temperature of the thermistor.

temperature = ... °C [2]

(c) A student suggests that the voltmeter, reading up to 10 V, could be calibrated to measure temperature.

Suggest two disadvantages of using the circuit of Fig. 6.2 with this voltmeter for the measurement of temperature in the range 0 °C to 25 °C.

1. .....

.....

2. .....

.....

[2]