

- 1 (a) (i) Define potential difference (p.d.).

.....
 [1]

- (ii) Define electromotive force (e.m.f.).

.....
 [1]

- (b) On Fig. 1.1, sketch the resistance-temperature characteristic of a negative temperature coefficient (NTC) thermistor.

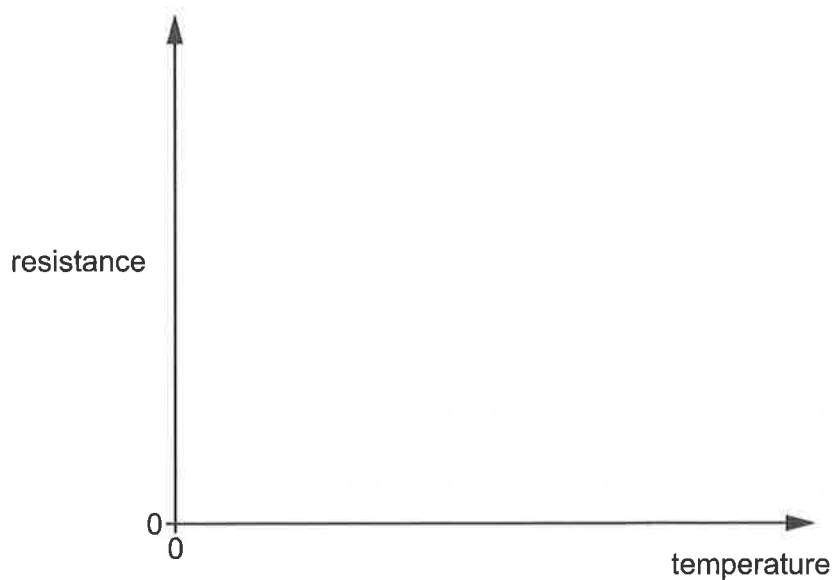


Fig. 1.1

[2]





(c) An NTC thermistor is connected in series with a $400\ \Omega$ fixed resistor and a 1.5 V cell which has negligible internal resistance.

(i) Draw a circuit diagram for this arrangement.

Include an ammeter to measure the current in the thermistor and a voltmeter to measure the p.d. across the thermistor.

[2]

(ii) At 25°C the resistance of the thermistor is $30\ \Omega$.

Calculate the potential difference across the fixed resistor.

potential difference = V [2]





(d) (i) Calculate the thermal power produced in the thermistor.

power = W [2]

(ii) The fixed resistor is replaced with a different fixed resistor of resistance $1.2\ \Omega$.

Explain the changes that happen in the circuit.

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..... [4]

[Total: 14]

