

Question Number	Answer	Mark
14ai	<p>Use of $\frac{1}{R} = \frac{1}{500\ \Omega} + \frac{1}{600\ \Omega}$ (1)</p> <p>Use of $V = IR$ (1)</p> <p>Voltmeter reading = 6.3 (V) (1)</p> <p><u>Example of calculation</u></p> <p>$\frac{1}{R_{\text{parallel}}} = \frac{1}{500\ \Omega} + \frac{1}{600\ \Omega}$, so $R_{\text{parallel}} = 273\ \Omega$</p> <p>$V = IR = 23.0 \times 10^{-3}\ \text{A} \times 273\ \Omega = 6.28\ \text{V}$</p>	3
14aii	<p>p.d. across thermistor = 12 V – 6.3 V (allow ecf from ai) (1)</p> <p>Use of $P = VI$ (allow use of $P = I^2R$ or $P = V^2 / R$) (1)</p> <p>$P = 0.13\ \text{W}$ (1)</p> <p><u>Example of calculation</u></p> <p>p.d. across thermistor = 12.0 V – 6.3 V = 5.7 V</p> <p>$P = VI = 5.7\ \text{V} \times 23 \times 10^{-3}\ \text{A}$</p> <p>$P = 0.13\ \text{W}$</p>	3
14b	<p>Resistance (of circuit/thermistor) increases (1)</p> <p>Ammeter reading decreases (dependent on MP1)</p> <p>Or Current decreases (dependent on MP1) (1)</p> <p>p.d. across thermistor increases</p> <p>Or $V=IR$ for fixed/parallel resistors, and I decreases (1)</p> <p>Reading on voltmeter decreases (dependent on MP3)</p> <p>Or p.d. across fixed/parallel resistors decreases (dependent on MP3) (1)</p> <p>(Allow 1 mark maximum if stated that both ammeter and voltmeter readings decrease, and no other marks have been awarded)</p>	4
Total for question 14		10