

Question number	Answer	Notes	Marks
5 (a)	any four in any order voltmeter; ammeter; power supply; <b>variable</b> resistor/connecting wires/switch;	accept battery  accept variable power supply for 2 marks	4
(b) i	any 1 of the following: MP1. resistance changes with temperature; MP2. temperature affects current; MP3. the wire will get hot because of the current;		1
ii	any suitable method; further detail; e.g. use a switch only on for short time allow wire to cool between readings use only low current	allow water bath	2
(c)	4 correct lines score 3 marks;;; 2 or 3 correct lines score 2 marks;; 1 correct line scores 1 mark;  <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>component</p> <div style="border: 1px solid black; padding: 2px; width: 100px; margin: 5px auto;">short thick copper wire</div> <div style="border: 1px solid black; padding: 2px; width: 100px; margin: 5px auto;">filament lamp</div> <div style="border: 1px solid black; padding: 2px; width: 100px; margin: 5px auto;">long thin copper wire</div> <div style="border: 1px solid black; padding: 2px; width: 100px; margin: 5px auto;">diode</div> </div> <div style="text-align: center;"> <p>graph</p> </div> </div> <p>-1 if multiple lines drawn to or from the same box</p>		3

**Total 10 marks**