

Question number	Answer	Notes	Marks
11 (a)	<p>MP1. ammeter connected in <u>series</u> with filament lamp;</p> <p>MP2. voltmeter connected in <u>parallel</u> with filament lamp;</p> <p>MP3. suitable method of varying the voltage (e.g. by using variable resistor or using variable power supply);</p>	<p>marks are for how components are connected so ignore circuit symbols throughout</p> <p>allow voltmeter connected in parallel with lamp and ammeter</p>	3
(b)	<p>any 4 of:</p> <p>MP1. read ammeter / voltmeter OR record current / voltage;</p> <p>MP2. current is measured for more than one voltage;</p> <p>MP3. repeat readings and calculate average (mean);</p> <p>MP4. plot graph;</p> <p>MP5. suitable experimental precaution, e.g. check meters for zero error / switch off current between readings;</p>		4

Total for question 11 = 7 marks