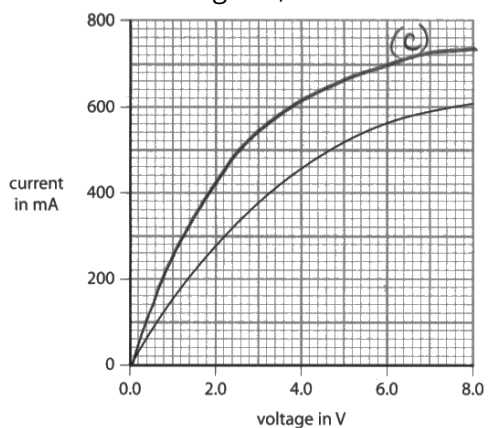


Question number	Answer	Notes	Marks
12 (a)	<p>series circuit containing lamp and some form of power supply; ammeter in series with lamp;</p> <p>voltmeter in parallel with lamp;</p> <p>some method of varying the voltage across the lamp;</p>	<p>allow any recognisable symbol</p> <p>allow any recognisable symbol</p> <p>e.g. variable power supply, variable resistor in series, potentiometer circuit etc.</p>	4
(b) (i)	<p>one correctly read pair of values from the graph; one correct value for resistance calculated; second correct value for resistance calculated;</p> <p>resistance increases (as voltage increases);</p>	penalise failure to convert mA to A once only	4
(ii)	<p>increasing voltage increases the current; (causing) greater (rate of) electron collisions; (causing) increase in temperature;</p>		3
(c)	<p>similar shape curve drawn so that all parts are above the existing line;</p> 		1

Total for question 12 = 12 marks