

Question number		Answer	Notes	Marks													
5	(a)	(i)	C (the same speed in free space)	1													
		(ii)	B (there must be a current in the circuit)	1													
	(b)	(i)	Voltmeter connected in <b>parallel</b> with any circuit component; Component chosen is the <b>LED</b> ;	2													
		(ii)	<b>Axes labelled-</b> quantity and unit ;  <b>Linear scale</b> such that longest bar occupies at least half the grid;  <b>Plotting---</b> ignore order of bars 5 bars correctly plotted;; If only 3 bars correctly plotted allow 1 mark for plotting <table><tr><th>Colour of light from LED</th><th>Minimum voltage in V</th></tr><tr><td>Red</td><td>1.7</td></tr><tr><td>Blue</td><td>3.6</td></tr><tr><td>Yellow</td><td>2.1</td></tr><tr><td>Orange</td><td>2.0</td></tr><tr><td>Green</td><td>3.0</td></tr></table>	Colour of light from LED	Minimum voltage in V	Red	1.7	Blue	3.6	Yellow	2.1	Orange	2.0	Green	3.0	voltage in V (or V/V) AND all bars (or points) labelled Ignore orientation Allow non-zero origin  Bar length plotted to nearest ½ small square  ALL data plotted correctly as floating “x’s” gets only one mark for plotting  Reject both <b>plotting</b> marks if a <b>line graph</b> is drawn (only scale and axes marks are available in this case)	4
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Red	1.7																
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		(iii)	Student is right/wrong - no mark  Any two of MP1 idea that the visible spectrum is a sequence, with the end colours identified;  MP2 Colour correctly related to wavelength (e.g. red has longest wavelength);  MP3 Colour correctly related to voltage (e.g. blue needs highest voltage);	Red to blue (start either end) Allow ROYGBIV etc  Wavelength (or frequency) correctly related to voltage = 2 marks, e.g. f increases with V λ increases with 1/V	2												