

Question number	Answer	Notes	Marks
1 (a)	<p>all 4 lines;;; any 2 lines;; any one line;</p>	(dotted line is given)	3
(b) (i)	light dependent resistor / LDR;	allow <ul style="list-style-type: none"> photo sensitive resistor light sensitive resistor allow recognisable spellings	1
(ii)	thermistor;	allow recognisable spellings total marks = 5	1

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2 (a)	<p>any suitable from: e.g.</p> <ul style="list-style-type: none"> • asteroid; • meteor(ite); • (artificial) satellite; • a moon; • comet; • <u>named</u> planet; <ul style="list-style-type: none"> • dwarf planet e.g. Pluto; • neutron star; • white dwarf; <p>any two suitable from:</p> <ul style="list-style-type: none"> • (the) Universe; • galaxy; • solar system; • star / Sun; <ul style="list-style-type: none"> • <u>named</u> planet (1); • <u>named</u> planet (2); <p>galaxy;</p>	<p>accept appropriate correct answers</p> <p>planets:</p> <ul style="list-style-type: none"> • Mercury • Venus • Mars <p>'Sun and star' is 1 mark only planets should be gas giants:</p> <ul style="list-style-type: none"> • Jupiter • Saturn • Uranus • Neptune 	4
(b) (i)	gravitational force / gravitational pull / (force of) gravity;		1
(ii)	B;		1
(iii)	single straight arrow directed towards the Sun;	judge by eye	1
(iv)	B;		1
total marks = 8			

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12 (a) (i)	94;		1
(ii)	any two sensible suggestions: e.g. <ul style="list-style-type: none"> • to make results (more) reliable; • to produce an average reading; • to identify anomalous results; • because there may have been a temperature change; • because there may have been friction in the syringe; 	ignore references to keeping it a fair test	2
(b) (i)	any sensible suggestion: e.g. <ul style="list-style-type: none"> • reduced scale gives fuller use of the grid; • because the lowest value of p or V is 50/eq; • because p or V cannot be zero; 	allow RA ignore there are no values below 40	1
(ii)	idea of straight line having an even distribution of points about the line; all points seem to be on the curve;	no mark for a bald 'it's the curve' or 'it's the line' allow points are very close to the curve	2
(iii)	any sensible suggestion; e.g. <ul style="list-style-type: none"> • keep the temperature constant • ensure no air gets into/out of the syringe/eq • keep apparatus exactly the same • wait for same time after adding/removing loads to take the volume reading 		1
(iv)	any two from: MP1. increase sensitivity/resolution of instruments; MP2. take reading(s) to fill in the middle of the graph/eq; MP3. take reading(s) to extend the range of the graph;	ignore references to parallax error / accuracy allow take readings with greater precision/eq	2