

Mark Scheme (Results)

January 2016

International GCSE
Physics (4PH0) Paper 2P

Pearson Edexcel Certificates in
Physics (KPH0) Paper 2P

Question number	Answer	Notes	Marks
1 (a)	B – force;		1
(b)	B – energy;		1
(c)	A - gravitational potential energy;		1
(d)	D – the vertical forces on it are balanced;		1

Total 4 marks

Question number	Answer	Notes	Marks
2 (a)	10 000; N;	allow 9800, 9810, 10^4 allow "newton(s)" marks are independent	2
(b) (i)	density = mass / volume;	allow abbreviation, e.g. $\rho = m/V$, $d = m/V$ or rearrangements	1
(ii)	substitution OR rearrangement; evaluation; e.g. $2300 = 1000/\text{volume}$ $= 0.43 \text{ (m}^3\text{)}$	award if either seen in working allow 0.4, 0.434, 0.435, 0.4347... condone 0.44	2
(c) (i)	bar chart / bar graph;	condone histogram	1
(ii)	any 1 from: MP1.idea that (density) data is discontinuous; MP2.materials have non-numerical values / are not quantifiable; MP3.material types identified as categories; MP4.idea that a line graph would indicate continuity;	discrete, categoric, non/not continuous	1
(iii)	cork is less dense OR water is denser; cork 25%, $\frac{1}{4}$ as dense OR water four times denser;	accept correct calculation of <u>both</u> densities for 2 marks	2

Total 9 marks

Question number	Answer	Notes	Marks									
3 (a)	any one line correct for one mark; all three lines correct for two marks;; state of matter particles solid close together, moving about and can slide past one another liquid far apart, moving quickly and at random gas close together, vibrating about fixed positions	more than one line to a box does not score	2									
(b) (i)	18; 192; <table><tr><td></td><td>Temperature in °C</td><td>Temperature in kelvin</td></tr><tr><td>room temperature</td><td>18</td><td>291</td></tr><tr><td>triple point of ethyne</td><td>-81</td><td>192</td></tr></table>		Temperature in °C	Temperature in kelvin	room temperature	18	291	triple point of ethyne	-81	192		2
	Temperature in °C	Temperature in kelvin										
room temperature	18	291										
triple point of ethyne	-81	192										
(ii)	decreases / OWTTE;	ignore "molecules slow down"	1									
(iii)	remains constant / no change / nothing;		1									

Total 6 marks

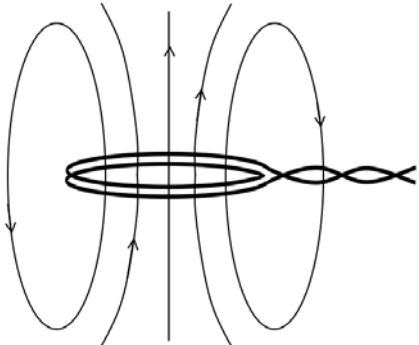
Question number	Answer	Notes	Marks
4 (a) (i)	MP1. (due to) friction (between car and ground/air); MP2. idea of <u>electron</u> transfer;	allow idea of materials rubbing allow 'scraped off' for transfer ignore "charge", "static" reject (for MP2 mark) protons moving / positive electrons	2
(ii)	idea of an insulator OR insulating material (between car and ground);	e.g. rubber tyre allow RA e.g. 'tyre is a non-conductor' ignore comments relating to charge being unable to move e.g. 'car not earthed'	1
(b) (i)	(otherwise there would be a risk of) shock / spark / fire / explosion;	ignore "to avoid travel sickness"	1
(ii)	any 2 from: MP1. metal (strap) is a conductor; MP2. (hence) idea of current / charge moving (in the strap/metal/wire); MP3. (electrons flow) between earth/ground/road and car;	reject references to positive charge/protons allow ideas of "earthing" or "grounding" e.g. "It (charge/car) is earthed by the strap"	2

Total 6 marks

Question number	Answer	Notes	Marks
5 (a)	idea that higher frequency gives higher pitch;	allow reverse argument condone idea of proportionality / linearity	1
(b) (i)	(wave) speed = frequency $\times$ wavelength	allow abbreviation, e.g. $v = f \times \lambda$ or rearrangements	1
(ii)	substitution into correctly rearranged equation; evaluation; e.g. (v =) 340 / 160 (v =) 2.1 (m)	allow 2.125, 2.12, 2.13 or 2 (if supported)	2
(c) (i)	straight line of best fit drawn within indicated area; 	line does not need to be extended beyond data range for this mark	1
(ii)	line of best fit extended to 20°C; student's own value from graph $\pm$ half a square;		2

(d)	any 2 from: MP1. speed (of sound) decreases (with temperature); MP2. frequency is constant; MP3. so wavelength decreases (with temperature);	allow 'sound slows down' ignore references to particle speed allow λ is smaller	2
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Total 9 marks

Question number	Answer	Notes	Marks
7 (a)	MP1. at least one straight, vertical central field line; MP2. any field line drawn circling the wire / at least one peripheral field loop; MP3. field directions correct and consistent throughout and shown on at least two lines; 	ignore breaking of field lines as they pass through the centre of the coil by eye condone spiral drawn round wire	3
(b)	any 3 from: MP1. idea of magnetic fields interacting; MP2. idea of (magnetic) attraction or repulsion; MP3. reversing current reverses direction of magnetic field / force; MP4. some comparison with magnets, e.g. like poles repel, unlike poles attract;	allow field lines crossing ignore 'cutting' reject mention of electrostatic force or charge mention of having 'poles'	3

Total 6 marks

Question number	Answer	Notes	Marks
8 (a) (i)	385 (J);		1
(ii)	substitution into $E=QV$; evaluation to at least 2 s.f.;	reverse calculation e.g. calculating a voltage or charge gains 1 mark max.	2
(iii)	e.g. ($E =$) $385 \times 180\,000$ ($E =$) $69\,000\,000$ (J) / 69 (MJ) MP1. idea of <u>energy</u> wasted; MP2. appropriate mechanism;	if no other mark given allow 1 mark for 10^6 or 1000000 seen in working allow ecf from 8(a)(i) value allow not 100% efficient, <u>energy</u> lost e.g. heat in wires	2
8 (b) (i)	charge = current $\times$ time;	allow abbreviations e.g. $Q = I \times t$ or rearrangements	1
(ii)	substitution; rearrangement; evaluation; e.g. $180\,000 = \text{current} \times (110 \times 60)$ (current =) $180\,000 / (110 \times 60)$ (current =) 27 (A)	ignore not converting time to seconds until evaluation allow 27.3, 27.27... 1600, 1640, 1636 etc. gain 2 marks if no other mark given allow 1 mark for 60 seen anywhere in working (attempt to convert to seconds)	3

Total 9 marks

