edexcel

Mark Scheme (Results)

November 2012

GCSE Physics
5PH2H/01

PEARSON

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk for our BTEC qualifications.
Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

If you have any subject specific questions about this specification that require the help of a subject specialist, you can speak directly to the subject team at Pearson.
Their contact details can be found on this link: www.edexcel.com/teachingservices.

You can also use our online Ask the Expert service at www.edexcel.com/ask. You will need an Edexcel username and password to access this service.

Pearson: helping people progress, everywhere
Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

GCSE Physics 5PH2H/01 Mark Scheme – November 2012

Question Number	Answer	Acceptable answers	Mark
1(a)(i)	B		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(a)(ii)	substitution (1) V = 0.5 x 12 evaluation (1) V = 6 (V)	Correct answer with no working shown gains two marks.	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(a)(iii)	- P / ammeter reading would increase. (1) - Q / voltmeter reading would increase (1)	They(both) would increase for two marks	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(a)(iv)	(current/it) would decrease (1)	smaller/lower/reduce/less Ignore slowing down	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)	**component symbol** **graph**	All three lines correct for 2 marks One or two lines correct for 1 mark More than one line against any box cannot score more than 1 mark in total.	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(a) (i)	B		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a) (ii)	Any one of the following 　　　Rocks 　　　Food 　　　Radon gas 　　　Cosmic rays 　　　Own bodies 　　　Fall-out 　　　Sun/stars (1)	Plausible named food such as coffee, brazil nut, bananas Space Specified medical/industrial use of x-rays Ignore smoke alarms, power stations (in normal use)	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a) (iii)	An explanation linking • personal circumstances such as 　　geographical location 　　nature of their work 　　lifestyle 　　　　　　(1) • the consequences such as 　　radiation from radon gas/particular rocks/fall-out (eg Chernobyl) 　　greater exposure to x-rays 　　greater exposure to cosmic rays 　　　　　　(1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
2(a) (iv)	D		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b) (i)	From the graph Time taken to fall (from 120 to) 60 (1) = 8 days (1)	Any other suitable pair of readings from graph 8.1, 8.2 Full marks for correct answer even if no working is evident	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b) (ii)	2.2 (days) (1)	between 2.0 and 2.5 2	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b) (iii)	Any one of the following: • Mutation of dna • Ionisation of cells • (Increases risk of) cancer (1)	damage / mutate cells	**(1)**

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	B		(1)

Question Number	Answer	Acceptable answers	Mark
3(a) (ii)	(equivalent to a) helium nucleus	Two protons and two neutrons for 2 marks helium/mass of 4 for 1 mark charge of +2 for 1 mark correct statement of any property for 1 mark	(2)

Question Number	Answer	Acceptable answers	Mark
3 (b)	A description to include any four of the following • neutron • is captured by a U-235 nucleus • nucleus (is) unstable • nucleus splits • into 2 daughter nuclei (of similar size) • (2 or more) neutrons are released • energy is released	• collides with /absorbed by (U-235) nucleus • metastable • named isotopes	(4)

Question Number	Answer	Acceptable answers	Mark
3 (c)	An explanation linking • moderator slows down (absorbs energy from) neutrons • more likely to be captured /cause fission (if it collides with a U-235 nuclei)	Reverse argument	(2)

Question Number	Answer	Acceptable answers	Mark
4 (a)	C		**(1)**

Question Number	Answer	Acceptable answers	Mark
4 a(ii)	In the cloud : reason 3 (1) At the tower: reason 2 (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
4 a(iii)	An explanation linking • the charge was neutralised (1) • by a transfer/flow of electrons (1)	Discharged/ becomes zero gained electrons / negative charge	**(2)**

Question Number	Answer	Acceptable answers	Mark
4 (b)	substitution (1) 52 = 2600 x time transposition time = 52 / 2600 (1) evaluation 0.02 (s) (1)	T = Q / I Full marks for correct answer even if no working is evident	**(3)**

Question Number	Answer	Acceptable answers	Mark
4 (c)	An explanation linking two of the following • charges flow through the metal wire • to the ground / earth • preventing build-up of (excess) charge (2)	mention of earthing discharged / neutral all objects at the same potential	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(a)(i)	substitution (1) work done = 84 x 0.25 evaluation (1) 21(J)	Full marks for correct answer even if no working is evident	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(a)(ii)	21 J	Ecf from (a)(i)	**(1)**

Question Number	Answer	Acceptable answers	Mark
5(a)(iii)	substitution (1) KE = ½ x 27 x $(2.3)^2$ evaluation (1) = 71.4 (which is approx 71)	V=2.29 gains two marks Reverse argument which shows that V = $\sqrt{5.3}$ gains two marks	**(2)**

Question Number	Answer	Acceptable answers	Mark
5 (a)(iv)	B		**(1)**

Question Number		Indicative Content	Mark
QWC	***5(b)**	An explanation linking some of the following points • kinetic energy varies during swing • kinetic energy maximum at bottom of swing • kinetic energy minimum at top of swing • gravitational potential energy(gpe) varies during swing • gpe maximum at top of swing • gpe minimum at bottom of swing • (continuous) interchange of KE and gpe • total amount of energy is constant during one swing • over a number of swings max KE and max PE decreases • energy is dissipated/'lost' to surroundings • because of air resistance / friction • amplitude/size of swings decrease (as energy 'lost' to surroundings) ignore references to momentum	**(6)**

Level	Mark	Descriptor
	0	No rewardable content
1	1 - 2	• a limited explanation which states some fact<u>s</u> e.g. (max) Kinetic energy decreases over time. KE will transfer to GPE. **or** KE increases and decreases over one swing. The height which the swing reaches gets less over time. • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy
2	3 - 4	• a simple explanation with links between facts; either over one period of oscillation or over several periods of oscillations. Kinetic energy decreases as he gets higher and the GPE increases. There is a continuous interchange of KE and gpe as he swings. **or** KE is gradually transferred to heat so swing rises to a slightly lower height each time. • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy
3	5 - 6	• a detailed explanation with links between facts over one period of oscillation **and** over several periods of oscillations e.g. kinetic energy is at a maximum at bottom of swing There is a continuous interchange of KE and gpe. KE (and gpe) reduce over a number of swings as energy is dissipated to the surroundings due to friction. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors

Question Number	Answer	Acceptable answers	Mark
6 (a) (i)	C		**(1)**

Question Number	Answer	Acceptable answers	Mark
6 (a) (ii)	acceleration	Recognisable mis-spellings More than one word written scores zero EXCEPT for the phrase Acceleration due to gravity which scores 1 mark	**(1)**

Question Number	Answer	Acceptable answers	Mark
6 (b)	Substitution weight = 0.00008 x 10 (1) evaluation 0.0008 (N) (1)	8×10^{-4} 1/1250	**(2)**

Question Number	Answer	Acceptable answers	Mark
6 (c)	Substitution speed = 13 / 1.7 (1) evaluation 7.6 (m/s) (1)	An answer which rounds to 7.6 eg 7.647 7.65 7.7	**(2)**

Question Number		Indicative Content	Mark
QWC	***6(d)**	A explanation including some of the following points • drops near the top are accelerating • due to force of gravity • travel a greater distance in given time • there is air resistance on the drops as they fall • this increases with velocity • resultant force is downward • this reduces resultant force • eventually resultant force is zero • drops have reached terminal/ maximum velocity • drops near bottom are all travelling at terminal velocity • so travel same distance in given time	**(6)**

Leve l	0	No rewardable content	
1	**1 - 2**	• a limited explanation such as one which correctly addresses either why the drops at the bottom are evenly spaced or why the drops at the top are not e.g. 　　drops at bottom are all going at the same speed OR 　　drops at top are speeding up • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• a simple explanation such as 　a correct comparison of the motion of the drops at top and bottom e.g. drops at bottom are travelling at terminal velocity whereas drops at top are still accelerating. **Or** 　a complete explanation of motion at either top or bottom e.g.at the bottom, air resistance and gravity forces are balanced so they travel at constant speed • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	**5 - 6**	• a detailed explanation such as one which explains why the motion of the drops at top and bottom are different e.g. The drops were initially accelerating due to a resultant force downwards. The acceleration decreased as they fell and eventually reached zero. With no acceleration their velocity was constant and so equal distance travelled in given time at the bottom. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Rewarding Learning