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Mark Scheme (Results)

Summer 2012

GCSE Physics
5PH2F/01

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Summer 2012
Publications Code UG033057
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GCSE Physics 5PH2F/01 Mark Scheme – Summer 2012

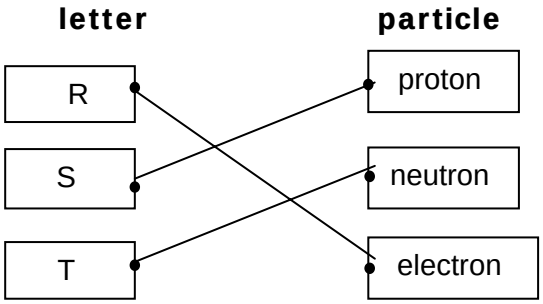
Question Number	Answer	Acceptable answers	Mark
1(a)	20(m)	value between 18 and 22	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)	substitution (1) 100/9.8 evaluation (1) 10 unit (1) m/s	 **Accept** 10.2 give 2 marks for correct answer, no working accept for 1 mark 9.65 or 9.7 mps	 **(3)**

Question Number	Answer	Acceptable answers	Mark
1(c)	An explanation linking the following points • speed changes (1) • (because) slower to begin with / faster at the end (1)	 not the same speed throughout slows down after 100 m he speeds up=2	 **(2)**

Question Number	Answer	Acceptable answers	Mark
1(d)(i)	**B** slowing down		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(d)(ii)	**D** speed in a stated direction		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)	 Three lines correct 2 marks One / two correct 1 mark	if two lines from a box reject mark for that box	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)(i)	An explanation linking **one** of the following pairs **Either** • loss of a negative (1) • electron (1) **Or** • hair's repel (1) • (because) like charges repel (1)	Allow explanation linking any two electron rubbed off (hair) = 2 (hair) stands on end opposite charges on hair and comb attract = 1	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)(ii)	**B** a conductor		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(iii)	An explanation linking **three** of the following points • paper is picked up (1) • charged objects attract uncharged (1) • charges separate on paper (1) • opposite charges attract (1) • weight is less than electrostatic force (1)	paper becomes positively charged paper is light	**(3)**

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	(force of) water (on ski)	air resistance/drag ignore wind/unqualified friction	**(1)**

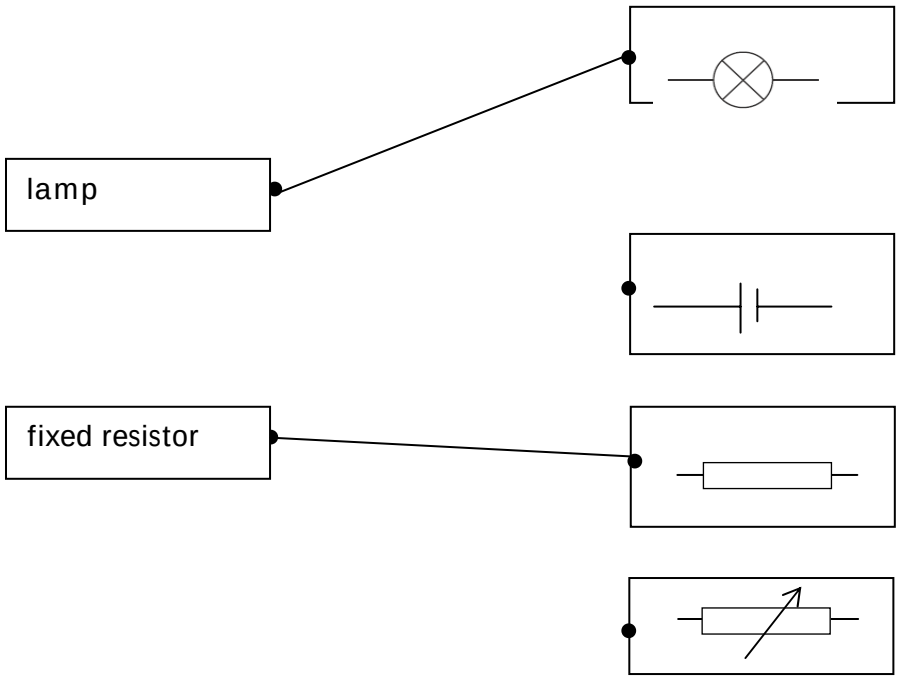
Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	substitution (1) 500 – 300 evaluation (1) 200 (N)	 give full marks for correct answer, no working	**(2)**

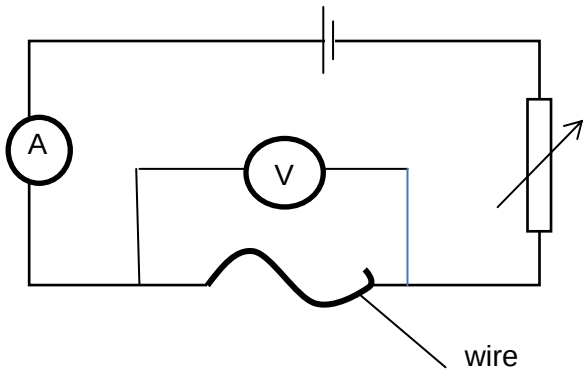
Question Number	Answer	Acceptable answers	Mark
3(a)(iii)	to the right	forward/direction skier is travelling/towards the boat	**(1)**

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	**B** J		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(b)(ii)	substitution (1) 54 × 10 × 5 evaluation (1) 2700	 **Ignore** unit (J) even incorrect give full marks for correct answer, no working	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(b)(iii)	A description including **two** of the following points • (some) KE at the ramp (1) • is transferred to GPE at top (1) • still has some KE at top (1) • some energy lost due to air resistance (1)	 KE to GPE for 1 mark air friction	**(2)**

Question Number	Answer	Mark
4(a)(i)		**(2)**

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	 ammeter in series (1) voltmeter in parallel (1)	'A' clearly in series with wire and cell anywhere on a complete circuit diagram 'V' in parallel with wire only / wire and 'A'	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(b)(i)	straight line drawn through origin and most points	line no thicker than half a cross – no tramlining ignore line after given four points	**(1)**

Question Number	Answer	Acceptable answers	Mark
4(b)(ii)	point plotted within ½ a small square		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(b)(iii)	An explanation linking **one** of the following pairs **Either** • taking reading between 0 and 4 V (1) • to check the straight line (1) **Or** • taking reading between 4 and 7 V (1) • to check straight line / confirm curve/find out what happens between 4 and 7 (1) **Or** • taking reading greater than 7 V (1) • to extend range (1) **Or** • repeating reading for 7 V / anomalous result (1) • to check that no mistake was made (1)	read secondary source / compare with other people (1)	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(b)(iv)	voltage value from graph (1) 3.0 substitution (1) 3.0 /1.5 evaluation (1) 2.0 (Ω)	3 3/1.5 2 give full marks for correct answer, no working accept 1.6 for 2 marks (ecf if 2.5 from graph)	**(3)**

Question Number	Answer	Acceptable answers	Mark
5(a)(i)	27 (1) 33 (1)	accept 33 27 for 1 mark	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(a)(ii)	**A** an electron		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(a)(iii)	A description including **three** of the following points • beta (radiation) is electron(s) (1) • beta has mass (1) • beta has (negative) charge (1) • beta is a better ioniser (1) • beta is less penetrating (1) • gamma radiation is electromagnetic (1) • wave (1) • gamma travels at a speed of light (1) • gamma is just energy (1)	**Allow** ORA where applicable allow em for electromagnetic ignore uses	**(3)**

Question Number		Indicative Content	Mark
QWC	***5(b)**	A description including some of the following points **Similarities (S)**: • involve nuclei • involve particles colliding • energy released • can cause explosions/rapid release of energy **Differences (D)**: **Fission** • splitting • of heavy nucleus • by neutron • chain reaction • products radioactive • used in power stations at present • rate can be controlled **Fusion** • joining smaller nuclei • to form larger nucleus • occurs in stars • needs very high temperature and/or pressure and/or particle density • because of like charge repulsion	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited description including a similarity OR a difference e.g. (S) both release energy OR (D) one is splitting, one is joining. • 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 description including **EITHER** one similarity AND one difference **OR** some differences / similarities e.g.(S) both give out energy but (D) fission uses uranium, fusion uses hydrogen. **OR** (D)fusion occurs in stars when hydrogen particles join **OR** (S) both involve nuclei and release energy • 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 description including EITHER two similarities (or one detailed) AND one difference OR one similarity and two differences (or one detailed) e.g. (S) uranium gives out energy (D) when it is hit by neutrons and energy is released (D) in fusion when (small) nuclei join. • 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)	Any **one** from the following • living things (1) • space (1) • nuclear power stations/accidents (1) • hospitals (1) • industrial processes (1)	 Ignore radon gas from … another radioactive rock a named radioactive substance eg uranium, radium, plutonium	**(1)**

Question Number	Answer	Acceptable answers	Mark
6(a)(ii)	**B** statement 2 only		**(1)**

Question Number	Answer	Acceptable answers	Mark
6(a)(iii)	An explanation linking **two** of the following points • radon gas comes from rocks (1) • types of rocks vary in different parts of the UK (1) • where there is more (of this type of) rock, the reading is higher (1)	 may be explained in terms of specific places eg Cornwall	**(2)**

Question Number	Answer	Acceptable answers	Mark
6(b)	A description of a change including the following points • used to be thought beneficial (1) • now known to be extremely {dangerous/hazardous} (1)	 {was commonly used (without care)/dangers were not realised} now known to cause cancer now can be used safely {under controlled conditions/medical supervision}	**(2)**

Question Number		Indicative Content	Mark
QWC	***6(c)**	A discussion including some of the following points Appropriate type of radiation is chosen - some passes through - – β and γ not α - significant change with thickness - - β Half-life - reference to half-life - not too long - too much material needed for activity - not too short – expense of replacing regularly - disposal problems Safety issues - shielding • type of radiation • linked to appropriate material and thickness - security • storage of spares • in use - safety procedures / precautions in use	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited discussion of one factor with no reasons e.g.(F) penetration / half-life/ safety. • 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 discussion linking some of one factor (F) with some reasoning (R) **OR** two factors e.g. (F) use a source which has a long/short half life (R) with suitable reason **OR** (F) use radiation which is affected by different thicknesses of paper and (F) mention of half-life. • 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 discussion of at least two factors with some reasons e.g. (F) use a (beta) radiation which is affected by thickness (R) because others will not penetrate at all (alpha) or will not be {affected / stopped} by paper (gamma) and (F) some discussion of half-life or safety. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

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