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Mark Scheme (Results)

November 2012

GCSE Physics
5PH1F/01

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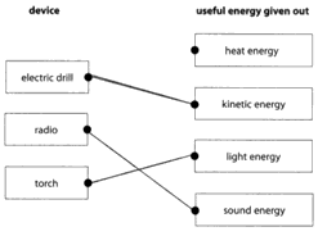
GCSE Physics 5PH1F/01 Mark Scheme – November 2012

Question Number	Answer	Acceptable answers	Mark
1(a)	1 red 2 orange 3 yellow 4 violet 1 mark for red **or** violet in correct place 1 mark for two of the three others in correct order		**(2)**

Question Number	Answer	Acceptable answers	Mark
1(b)	A		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(c)	• Idea of shining UV light on note (1) • genuine notes (makes them) glow **ORA** (1)	Scan / (put) under fluoresce/emit light/show symbol/Queen's head/markings	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(d)	An explanation including two of the following points: • (potential) danger increases with frequency (1) • UV has a higher frequency than IR (1) • UV is more dangerous **ORA**(1) • IR causes burns (1) • UV causes (skin)cancer(1)	danger is greater at higher frequency damages/ mutates cells IGNORE eye damage/sunburn	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(a)(i)	 drill → kinetic energy radio → sound torch → light	More than one line to or from a box gets no mark for that box.	**(3)**

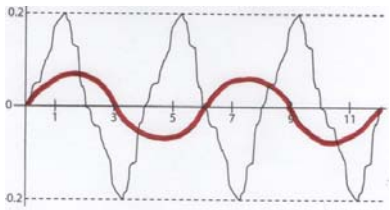
Question Number	Answer	Acceptable answers	Mark
2(a)(ii)	heat/thermal/internal		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(i)	300 / 2500-2200 (J)	Accept correct working with wrong answer	**(1)**

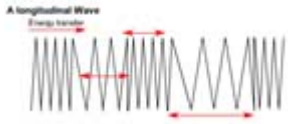
Question Number	Answer	Acceptable answers	Mark
2(b)(ii)	chemical to heat/thermal/internal		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(iii)	An explanation linking any two of the following: • Kettle insulated / beaker is not insulated (1) • kettle loses/wastes less heat or energy **ORA** (1) • element inside kettle / bunsen or flame open (to surroundings) (1)	Kettle is plastic/more closed/has a lid/keeps in heat or energy **ORA** kettle is more efficient **ORA** Kettle keeps in more energy = 2 marks **ORA** IGNORE references to gas/electricity or light/sound energy or speed of boiling	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	12/3 (1) 4 (m) (1)	the wave shown is for 3 wavelengths any correct ratio give full marks for correct answer, no working	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	all amplitudes smaller (1) all wavelengths longer (1)	Accept smaller peak to trough distance wherever it is drawn all wavelengths shown must be longer than original can be any shape must be at least half a wavelength shown 	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	{P-wave / ultrasound / infrasound / shock} (1)	P/primary/pressure (wave) **IGNORE** slinky/spring/push-pull	**(1)**

Question Number	Answer	Acceptable answers	Mark
3(b)(ii)	Any two from: vibrations different direction (1) In longitudinal (vibrations) move in same direction as {wave/energy} moves (1) In transverse (vibrations) move at right angles to direction {wave/energy} moves (1)	 In one is up and down, other is backwards and forwards / any two different motions **AND** in longitudinal (particles) move backwards and forwards  in transverse (particles) move up and down/ side to side 	**(2)**

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

Question Number	Answer	Acceptable answers	Mark
3(c)(ii)	substitution (1) ie 340 / 1047 evaluation (to at least 2 sf) (1) ie between 0.32 and 0.33 (m) inclusive conversion of m to cm (1)	No **RA** If incorrect value chosen for frequency cannot get substitution mark but can get evaluation mark and conversion mark frequency (Hz) evaluation(m) 1290 0.26 1245 0.27 1200 0.28 1174 0.29 1109 0.31 960 0.35	**(3)**

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

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	An explanation linking two of the following: • (uneven) heat (from the core) (1) • convection (currents) (1) • (that are in) the mantle (1)		**(2)**

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

Question Number	Answer	Acceptable answers	Mark
4(c)(i)	Description to include: • (they can be) reflected (1) • (and/or) refracted (1)	 bounce off/back change direction/speed	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(c)(ii)	Substitution (1) 1200/200 Evaluation (1) 6 (km/s)	 Power of 10 error max 1 mark give full marks for correct answer, no working	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(d)	An explanation linking • tsunamis are caused by underwater earthquakes / volcanic eruption (1) • are random/irregular (1)	 Underwater movements of the plates / landslip into the sea / meteorite strike into the sea can happen at any time / do not know when it will happen	**(2)**

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

Question Number	Answer	Acceptable answers	Mark
5(a)(ii)	ampere(s), amp(s), A		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(b)(i)	A description linking magnet (1) (in/near) coil (1) (magnet/coil) spins/moves/turns (1)	 IGNORE handle turns	 **(3)**

Question Number	Answer	Acceptable answers	Mark
5(b)(ii)	Any one from the following: Increase strength of magnet (1) Increase number of coils/turns of wire (1) Increase speed of rotation (1)	 add another magnet / move magnets closer turn handle/magnet/coil faster IGNORE bigger magnet/coil/ generator / longer wire	**(1)**

Question Number		Indicative Content	Mark
QWC	***5(c)**	A comparison including some of the following points Non- renewable sources • coal, oil, gas and nuclear • coal, oil, gas are fossil fuels • fossil fuels will run out • fossil fuels burn and produce CO_2 • fossil fuels burn to produce atmospheric pollution • CO_2 contributes to global warming • are a more expensive source • Nuclear power stations do not produce CO_2 • Nuclear power produces radioactive waste • Radioactive waste is dangerous and difficult to store safely Renewable resources • Wind, waves, solar, biofuels, geothermal and hydroelectric • are a free/cheaper source • The energy source is unreliable • No (net) CO_2 produced • No atmospheric pollution (except biofuels) • Waves and hydroelectric cause environmental changes • Wind farms and solar panels give visual pollution • Wind farms can be built off shore Comparison • Fossil fuel power stations are cheaper to build than wind farms for the same power output • Coal, oil, gas and nuclear fuel will run out, wind, waves and sun will always be available • Fossil fuel power stations produce CO_2 which may increase global warming, renewable energy generators (wind farms) do not • Renewable energy generators have a free/cheaper source of fuel • fossil fuels have to be taken out of the ground • Nuclear power stations produce radioactive waste, which is dangerous, none of the other energy generators do this. • Wind, waves and sun are unreliable sources of energy but fossil and nuclear fuels are always available	**(6)**

Level	0	No rewardable content
1	1 - 2	• a limited statement about either renewable or non-renewable e.g. Coal is non-renewable **OR** renewable energy will not run out **OR** oil will run out • 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 comparison including 2 statements covering renewable and non-renewable e.g. Coal is non-renewable and solar power is renewable **OR** renewable energy sources will not run out and non-renewable sources do not pollute the atmosphere **OR** oil will run out, solar will not • 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 comparison including at least 3 statements with a direct comparison between a renewable and a non-renewable source, at least one named e.g. Renewables will not run out but non-renewables like coal will. **OR** Coal is non-renewable. When it is burnt carbon dioxide is produced. Wind farms do not produce any carbon dioxide. **OR** Carbon dioxide is produced when coal is used. Wind farms do not produce any carbon dioxide. Wind farms are noisy. **OR** Oil will run out, solar will not. Oil causes air pollution • 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)	telescope	(astronomical/refracting/light) telescope **IGNORE** any other type of telescope	**(1)**

Question Number	Answer	Acceptable answers	Mark
6(b)(i)	4 (June)	4-6; 6-4 (UK/US dates) 20 (June); 20-6; 6-20	**(1)**

Question Number	Answer	Acceptable answers	Mark
6(b)(ii)	16 (days)		**(1)**

Question Number	Answer	Acceptable answers	Mark
6(b)(iii)	1 741 000 (km) (2) **OR** 1 070 000 + 671 000 (km) (2) **OR** 399 000 + {2 x 671 000} (km) (2)	Power of 10 error max 1 mark Use of 1 070 000 and 671 000 (km)/ Use of 399 000 and 2 x 671 000 (km)/ 12 June marked correctly on the orbit for Ganymede/ answer of 399,000 with no working gets 1 mark	**(2)**

Question Number		Indicative Content	Mark
QWC	***6(b) (iv)**	A description including some of the following points reasons for the distance changing appreciation of a difference in time/speed/size of orbit smallest separation on 4/20th June smallest separation 399 000 km largest separation 1 741 000 km largest separation on 12/28 June moon separation increases after 4th June. distance between moons increases and then decreases as they orbit distance increased after 4 June which was smallest separation of 399 000 km Distance increases from a minimum on4th June to a maximum on 12th June, back to a minimum on 20th June and maximum on 28th June distance change is not linear	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited description giving 1 relevant piece of information taken from the diagram e.g. Europa orbits in a shorter time **OR** The moons have different sized orbits **OR** Europa orbits in 8 days • 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 giving either the size or the date of smallest or largest separation **OR** giving increase and/or decrease of separation e.g. The moons are closest on the 4th June **OR** Moon separation increases after 4th June **OR** the distance between the moons increases then it decreases • 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 indicating an increase and decrease in separation plus a date or distance **OR** describes 3 orbits e.g. The distance between the moons increases till 12 June then it decreases **OR** the distance between the moons increases, then decreases, then increases again • 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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