

Mark Scheme (Results)

Summer 2014

Pearson Edexcel GCSE
in Physics (5PH1F) Paper 01

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Question Number	Answer	Acceptable answers	Mark
1 (a) (i)	In ANY order smaller than the object (1) upside down (1)		(2)

Question Number	Answer	Acceptable answers	Mark
1 (a) (ii)	The idea that it can be captured on a screen	appears where the rays (of light) meet ignore references to reflection	(1)

Question Number	Answer	Acceptable answers	Mark
1 (a) (iii)	A (10)		(1)

Question Number	Answer	Acceptable answers	Mark
1 (a) (iv)	A (refraction by a converging lens)		(1)

Question Number	Answer	Acceptable answers	Mark
1 (b)	image was larger/magnified (compared with naked eye).	better {information / detail} / see {further / clearer /further away} / fainter /more objects / zoom in OWTTE	(1)

Question Number	Answer	Acceptable answers	Mark
1 (c)	<p>Description to include:</p> <p>Geo = Earth at the centre (of the Solar System) (1)</p> <p>Helio = Sun at the centre (of the Solar System) (1)</p>	<p>"everything goes around the Earth / us" the Sun goes around the Earth</p> <p>"everything goes around the Sun" we revolve around the Sun</p> <p>Allow answers in diagram form</p> <p>Allow 1 mark for both descriptions the wrong way round</p>	(2)

(Total for Question 1 = 8 marks)

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

Question Number	Answer	Acceptable answers	Mark
2(a)(ii)	C the Milky Way (1)		(1)

Question Number	Answer	Acceptable answers	Mark
2(a)(iii)	D Proxima Centauri (1)		(1)

Question Number	Answer	Acceptable answers	Mark
2(b)	description to include: <ul style="list-style-type: none"> • method (1) • relevant detail (1) 	Telescope (inc. radio telescopes) Lander (e.g. robots/drones) Orbiter / Satellite has camera / takes photos / collecting samples (e.g rocks) / analyse atmosphere / climate / signs of water / gases that will support life / can test for water/nutrients ignore repeat of stem	(2)

Question Number	Answer	Acceptable answers	Mark
2(c)(i)	<p>explanation linking two from:</p> <ul style="list-style-type: none"> • (on Earth) image is distorted / image not bright enough (ORA) (1) • planets very small / far away (1) • atmosphere (in way) / light pollution (1) • can detect different parts of em spectrum (that are not detectable on Earth) (1) • can keep it pointed at the same spot more easily (1) 	<p>Reverse arguments apply throughout</p> <p>(above atmosphere gives) more defined / clearer / better image</p> <p>obscured by clouds</p> <p>waves can be detected (that are not detectable on Earth)</p> <p>not affected by Earth's rotation</p>	(2)

Question Number	Answer	Acceptable answers	Mark
2(c)(ii)	<p>Suggestion:</p> <ul style="list-style-type: none"> • planet takes 150 days to orbit the star (1) 	has 150 days in a year	(1)

(Total for Question 2 = 8 marks)

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	B (50 m)		(1)

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	kinetic (1) electrical (1) in this order.	movement electric, electricity poor spellings of electrical electronic Reject 2 forms of energy in one answer	(2)

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	140 (J)	200 – 60 140 in words	(1)

Question Number	Answer	Acceptable answers	Mark
3(b)(ii)	<ul style="list-style-type: none"> substitution (1) $\frac{60}{200} \times 100 \%$ evaluation (1) 30 % 	$\frac{60}{200}$ 0.3 ignore units Award full marks for correct answer with no working	(2)

Question Number	Answer	Acceptable answers	Mark
3(b)(iii)	explanation linking: <ul style="list-style-type: none"> energy supplied and radiated (1) (at) equal (rate) (1) 	allow used for radiated heat gained = heat lost 2 marks input energy = output energy 2 marks input power = output power 2 marks input = output 1 mark	(2)

Question Number	Answer	Acceptable answers	Mark
3(c)	<ul style="list-style-type: none"> substitution (1) $\frac{6000}{250}$ evaluation (1) 24 (years) 	Award full marks for correct answer with no working ignore units	(2)

(Total for Question 3 = 10 marks)

Question Number	Answer	Acceptable answers	Mark
4(a)(i)	an explanation linking: <ul style="list-style-type: none"> • frequency / Hz (1) • above 20 000 (1) 	Pitch too high to be heard by the man "it is above 20kHz" 2 marks "The frequency is too loud" gets 1 st mark	(2)

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	substitution: (1) 140/0.42 evaluation: (1) 330 m/s (1)	award full marks for correct answer with no working allow 333(.333) independent mark allow ms^{-1}	(3)

Question Number	Answer	Acceptable answers	Mark
4(b)(i)	A infrasound wave (1)		(1)

Question Number	Answer	Acceptable answers	Mark
4(b)(ii)	<ul style="list-style-type: none"> • arrows to show vibration in opposite directions (1) • parallel to arrow on diagram (1) 	arrows do not have to go through R horizontal and vertical – no marks multiple directions – no marks	(2)

Question Number	Answer	Acceptable answers	Mark
4(c)	Explanation linking: <ul style="list-style-type: none"> • <u>convection</u> (currents) (1) • in mantle (1) 	Accept answers in form of a labelled diagram in molten rock in magma below plates in the hot rock coming from the core under Earth's crust under surface ignore lava clear unlabelled diagram scores maximum 1 mark clear labelled diagram scores maximum 2 marks	(2)

(Total for Question 4 = 10 marks)

Question Number	Answer	Acceptable answers	Mark
5(a)(i)	X-ray	X	(1)

Question Number	Answer	Acceptable answers	Mark
5(a)(ii)	(visible) light	visible (waves)	(1)

Question Number	Answer	Acceptable answers	Mark
5(a)(iii)	radio (waves)		(1)

Question Number	Answer	Acceptable answers	Mark
5(a)(iv)	gamma / X-rays / ultraviolet	☐☐☐ X / UV	(1)

Question Number	Answer	Acceptable answers	Mark
5(b)	an explanation linking: <ul style="list-style-type: none"> • travel with same speed (1) • in a vacuum / in space (1) 	They travel at the speed of light / same numerical speed for all	(2)

Question Number		Indicative Content	Mark
QWC	*5 (c)	<p>A description including some of the following points</p> <ul style="list-style-type: none"> • Harmful effects include (skin) burns, eye damage, (skin) cancer, cell damage, mutation • IR and UV are on either side of visible light (in the em spectrum) • UV has shorter wavelength than IR • UV has higher frequency than IR • higher energy (associated) with UV • IR causes (skin) burns • UV causes damage to eyes / (skin) cancer / damage to cells (not just damage to skin) / sunburn • (potential) danger increases with frequency <p>Ignore</p> <ul style="list-style-type: none"> • irrelevant information e.g. UV used to scan unborn babies 	(6)
Level	0	No rewardable content	
1	1 - 2	<ul style="list-style-type: none"> • a limited description stating one fact about a harmful effect or frequency e.g. skin burns OR UV has high frequency (no comparison) • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy 	
2	3 - 4	<ul style="list-style-type: none"> • a simple description making a correct <u>comparison</u> of harmful effects OR a frequency comparison e.g. IR causes skin burns and UV causes (skin) cancer OR the higher the frequency the more harm they cause OR UV has a <u>higher</u> frequency (than IR) • 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	<ul style="list-style-type: none"> • a detailed description including harmful effects of both UV and IR AND relating at least one to <u>frequency</u> e.g. UV causes skin cancer but IR (only) causes skin burns as UV has a high(er) frequency • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors 	

(Total for Question 5 = 12 marks)

Question Number	Answer	Acceptable answers	Mark
6(a)(i)	60 (kW h/ units) (1)	15459 - 15399	
	60 x 20 (= 1200) (p) (1)	£12 ecf Award full marks for correct answer with no working £12 scores 2 Power of Ten error scores maximum 1 60 in answer space with no working scores 1	

Question Number	Answer	Acceptable answers	Mark
6(a)(ii)	60 / 15 (1)	Allow ecf from 6(a)(i) marking point 1 Award full marks for correct answer with no working	(2)
	4 (kW) (1)		

Question Number	Answer	Acceptable answers	Mark
6(b)	An explanation linking any two of: <ul style="list-style-type: none"> • increase voltage (1) • decrease current (1) • reduce {loss / waste} of {energy / heat} (1) 	Increase efficiency (of energy transmission) Ignore "more efficient" by itself Accept power instead of energy Accept no energy loss	(2)

Question Number		Indicative content	Mark
QWC	*6(c)	<p>A description to include some of the following points</p> <ul style="list-style-type: none"> • speed of movement • stronger / more powerful (ORA) magnet • more turns / coils (ORA) • iron core • reversing movement • turning the magnet round • effect of any / each change • more conducting / less resistant wire <ul style="list-style-type: none"> • allow stronger current • allow ammeter reading / recording / voltage for current • allow moving coil <p>Correct ideas but using inaccurate scientific terminology</p> <ul style="list-style-type: none"> • larger / bigger magnet • more / longer movement <p>Ignore</p> <ul style="list-style-type: none"> • irrelevant information • speeds up current or more electricity 	(6)
Level	0	no rewardable material	
1	1-2	<ul style="list-style-type: none"> • a limited description of any one change e.g. use more coils OR a stronger magnet. • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy 	
2	3-4	<ul style="list-style-type: none"> • a simple description of any two different changes OR one change and its effect e.g. use more coils and a weaker magnet OR more coils more current • 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	<ul style="list-style-type: none"> • a detailed description of a change linked to its effect and a second different change e.g. using more turns of wire makes a bigger current. Moving the magnet out. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors 	

(Total for Question 6 = 12 marks)

