edexcel

Mark Scheme (Results)

Summer 2014

Pearson Edexcel GCSE in Physics (5PH1F) Paper 01

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. 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. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. 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

Summer 2014
Publications Code UG040005

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)	Description to include: Geo = Earth at the centre (of the Solar System) (1) Helio = Sun at the centre (of the Solar System) (1)	 "everything goes around the Earth / us" the Sun goes around the Earth "everything goes around the Sun" we revolve around the Sun Allow answers in diagram form Allow 1 mark for **both** descriptions the wrong way round	**(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: • 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)	explanation linking two from: • (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)	Reverse arguments apply throughout (above atmosphere gives) more defined / clearer / better image obscured by clouds waves can be detected (that are not detectable on Earth) not affected by Earth's rotation	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(c)(ii)	Suggestion: • 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)	• 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: • 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)	• 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: • 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 1st 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)	• 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: • <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: • 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)**	A description including some of the following points • 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 Ignore • irrelevant information e.g. UV used to scan unborn babies	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• 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**	• 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 high<u>er</u> frequency (than IR) • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • <u>spelling, punctuation and grammar are used with some accuracy</u>	
3	**5 - 6**	• 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) 60 x 20 (= 1200) (p) (1)	15459 - 15399 £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	**(2)**

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

Question Number	Answer	Acceptable answers	Mark
6(b)	An explanation linking any two of: • 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)**	A description to include some of the following points • 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 • allow stronger current • allow ammeter reading / recording / voltage for current • allow moving coil Correct ideas but using inaccurate scientific terminology • larger / bigger magnet • more / longer movement Ignore • irrelevant information • speeds up current or more electricity	**(6)**
Level	**0**	no rewardable material	
1	**1-2**	• 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**	• 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**	• 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)

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE