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IGCSE DA Physics 4437 3F Mark Scheme (Results) Summer 2008

IGCSE

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4437-3F MARK SCHEME

Abbreviations used in mark scheme:

OWTTE - or words to that effect
dop - depending on previous
ecf - error carried forward
ora - or reverse argument
sfs - start from scratch
UP - unit penalty

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (a)(i)	P	p		**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (a)(ii)	Q	q		**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (a)(iii)	Q and R	q and r either order		**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (b)(i)	sloping straight independent marks but sloping and horizontal scores (0)		sloping and horizontal	**1** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (b)(ii)	horizontal ignore 'straight'			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (c)	less distance (travelled in section R than in section P)			**(1)**

(Total 7 marks)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (a)(i)	long	allow answers to (i) and (ii) in either order		**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (a)(ii)	frayed			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (b)	stray wire(s)			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (c)(i)	plastic (casing)			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (c)(ii)	small/low current			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (d)	* circuit breaker * double insulation	either one		**(1)**

(Total 6 marks)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (a)	energy information	in either order		**1** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (b)	D C		wrong order	**1** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (c)(i)	cycles/waves second/unit time		wrong order	**1** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (c)(ii)	speed	velocity (time) period time to travel a wavelength		**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (d)(i)	longitudinal			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (d)(ii)	20 Hz – 20 000 Hz			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (d)(iii)	less than			**(1)**

(Total 10 marks)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4 (a)(i)	microphone			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4 (a)(ii)	kettle/iron/heater/ (electric) fire/ toaster/hairdryer/ soldering iron	there are many other examples credit if the useful energy transfer is from electricity to heat		**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4 (b)	any falling body		do not credit examples where both falling and rising occur e.g. child's swing or bungee jump unless falling is specified	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4 (c)	heat	sound		**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4 (d)	total energy input total energy output	in either order scores 2 or 0		**(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4 (e)	kinetic kinetic			**1** **1** **(2)**

(Total 8 marks)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
5 (a)(i)	100 000			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
5 (a)(ii)	500 000	100 000 × 5 for (1) mark		**2 (2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
5 (b)(i)	330	400 – 70 for (1) mark		**2 (2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
5 (b)(ii)	background (count/radiation) random/variable/not constant			**1** **1 (2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
5 (c)	cosmic rays/rocks/medical etc	any two (1) each		**(2)**

(Total 9 marks)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
6 (a)	yellow green	1 mark if colours reversed		**1** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
6 (b)(i)	A infra-red B ultra violet		answers reversed	**1** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
6 (b)(ii)	B / ultra violet			**(1)**

(Total 5 marks)

Question Number	Correct Answer	Acceptable Answers	Mark
7(a)(i)	0.8 (seconds)	4/5 second 8/10 second	**1** **(1)**

Question Number	Correct Answer	Acceptable Answers	Mark
7(a)(ii)	3.2 (seconds)	3 1/5 allow **ecf** from (i) 4.0 – previous answer	**1** **(1)**

Question Number	Correct Answer	Acceptable Answers	Mark
7(a)(iii)	*one line* horizontal line beyond 0.8 less steep slope down (to the *x* axis) **dop**	 *two separate lines or one of these lines* labelled 1 mark for each correct	 **1** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
7(b)(i)	air (resistance) mass of car speed (of the car) brakes tyre pressure area of tyre streamlining	drag weight (force of) gravity size shape velocity (of car)	wind (resistance) temperature	**1** **(1)**

Question Number	Correct Answer	Reject	Mark
7(b)(ii)	intentionally straight vertical arrow pointing downwards from, above, below or through point X	arrow from middle of car	**1** **(1)**

(Total 6 marks)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
8(a)(i)	infra red *allow* phonetic spelling	i.r. IR	microwaves ultraviolet	**1** **(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
8(a)(ii)	gamma (rays/radiation)	γ gama	X-rays	**1** **(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
8(b)(i)	same speed (in a vacuum) same velocity (in a vacuum) *or* (travel at) speed of light (travel at)velocity of light	travel through a vacuum or empty space	transverse	**1** **(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
8(b)(ii)	water (waves)/waves on water/tidal waves/sea waves/ocean waves	waves on (slinky) spring shaken/moved up and down or side to side waves on a rope moved up and down or side to side S waves *ignore* 'seismic' mexican wave	P waves analogue wave waves on a CRO	**1** **(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
8(b)(iii)	90˚ energy *independent marks*	normal/ perpendicu right angles information or data wavefront/front	 crest/vibration/direction/ pattern	**1** **1** **(2)**

(Total 6 marks)

Question Number	Correct Answer	Acceptable answers	Reject	Mark
9(a)(i)	voltage = current × resistance *or* current = voltage/resistance *or* resistance = voltage/current	V = IR I=V/R R=V/I	V = C x R	**1** **(1)**
9(a)(ii)	4.5 **nwn** volts or V or J/C or JC^{-1} or AΩ			**1** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Mark
9(b)	decrease increase	 Increase decrease scores 1 decrease decrease scores 1 increase increase scores 1	**1** **1** **(2)**

(Total 5 marks)

Question Number	Correct Answer	Reject	Mark
10(a)(i)	(semiconductor)diode	LED light emitting diode	**1** **(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
10(a)(ii)	50 50	both required		**1** **(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
10(a)(iii)	one cell is connected the wrong way some of the voltage is across/used up by diode/component Y/ ammeter(s)/(connecting) wire /switch	two cells cancel one another/not all facing the same way reference to resistance of these components /cells / whole circuit	battery voltage used up by/voltage across *voltmeter/lamp* voltmeter does not have infinite resistance *ignore* reference to current and energy	**1** **1** **(2)**

Question Number	**Correct Answer**	Acceptable Answers	Mark
10 (b)	*any <u>three</u> points* current increases increases temperature increases resistance line or slope becomes less steep	 voltage increases increases heat **/** molecular movement non-ohmic / *I* not proportional to *V*/ decrease rate of increase /current levels off	 **1** **1** **1** **(3)**

(Total 7 marks)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
11 (a)(i)	not moving (or vibrating) none zero	no <u>kinetic</u> energy no momentum	a response which suggests any kind of movement	**1** **(1)**

Question Number	Correct Answer	Acceptable Answers	Mark
11 (a)(ii)	-273 (˚C)	minus 273 -273.15	**1** **(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
11 (a)(iii)	373 (K)	373.15(K)	373˚C	**1** **(1)**

Question Number	Correct Answer	Reject	Mark
11 (b)	particles knock /jostle /collide smaller/invisible /air/water particles cause a change of direction **dop** only as 3rd mark	diffusion	**1** **1** **1** **(3)**

(Total 6 marks)

PAPER TOTAL 75 MARKS