

IGCSE Double Award Science (Physics) 4437/6H

Mark Scheme (Results)
November 2008

IGCSE

IGCSE Double Award Science - Physics (4437/6H)



The following acronyms are used

owtte or words to that effect

ecf error carried forward

dop dependent on previous

nwn no working necessary

Question Number	Correct Answer	Extra Information	Mark
1 (a)	(A) a.c. (power supply)	do not credit just 'power supply'	1
	(B) (open) switch / switch which is off		1
	(C) (electric) motor	do not credit 'meter'	1
	(D) variable resistance / rheostat		1
			(4)

Question Number	Correct Answer	Extra Information	Mark
1 (b) (i)	voltmeter voltage/potential difference/p.d.	both parts required do not accept voltameter	
		voltemeter voltagemeter etc	(1)

Question Number	Correct Answer	Extra Information	Mark
1 (b) (ii)	ammeter	both parts required do not accept ampmeter	
	current/rate of flow of charge	if the meters in both (i) and (ii) are correct award (1) mark	(1)

Question	Correct Answer	Extra Information	Mark
Number			
2 (a)	0.5	accept '½'	1
	hertz/Hz	accept '(waves) per second'	1 (2)

Question	Correct Answer	Extra Information	Mark
Number			
2(b)	light (or any particular named colour of light) (waves)	or any member of the electromagnetic	
	S-waves	spectrum	
	secondary waves	or waves on (slinky) s shaken/moved <u>up</u>	
		and down	(1)

Question Number	Correct Answer	Extra Information	Mark
2 (c)	information	allow :data /signal	(1)
			(1)

Question Number	Correct Answer	Extra Information	Mark
2 (d)	time between one wave and the next	or 'time taken for each wave to pass (a point)'	1
	complete/full	credit 'time period is the inverse / reciprocal of the frequency' with both marks	(2)

Question Number	Correct Answer	Extra Information	Mark
3 (a)	kinetic	do not credit just 'movement' 'wind' or 'mechanical'	1
	thermal/heat sound	both required but either order	1 (2)

Question Number	Correct Answer	Extra Information	Mark
3 (b)	<pre>(efficiency) = useful (energy) output (×100%) total (energy) output/input</pre>		
			(1)

Question Number	Correct Answer	Extra Information	Mark
3 (c)	either 45 000 (2) joules/J (1) or 45 kilojoules/kJ (3)	or 50 × 15 × 60 (1) joules /J (1) or 15 minutes = 900 s (1)	
		50 x 15 = 750 (0) 750 J (1)	(3)

Question Number	Correct Answer	Extra Information	Mark
4 (a)	rock or named rock e.g granite, sand etc space	allow any reasonable	
	cosmic rays Sun	response	
	nuclear waste radon	do not allow '(nuclear) power	
	food water	stations' or 'building materials'	
	medical sources etc etc		(1)

Question	Correct Answer	Extra Information	Mark
Number			
4 (b) (i)	the <u>card</u> reduces (or stops) the radiation/emission/	or words to that	
	count rate/reading	effect	
			(1)

Question	Correct Answer	Extra Information	Mark
Number			
4 (b) (ii)	the <u>metal</u> reduces (or stop) the radiation/emission/count rate/reading	or words to that effect	
	-		(1)

Question Number	Correct Answer	Extra Information	Mark
4 (b) (iii)	(the card and)the metal will not reduce (or stop) the radiation/emission/count rate/reading from gamma /γ (radiation)	or words to that effect	(1)

Question	Correct Answer	Extra Information	Mark
Number			
4 (c)	25 (MBq)	credit (1) mark if	
		unambiguous	
		indication that one	
		hour equivalent	
		to four half lives	(2)

Question Number	Correct Answer	Extra Information	Mark
5 (a)	water is a good conductor	or wet skin has a lower (electrical)	1
	(so increases chance of) (electric) shock /current in the body /heart failure	resistance (than dry skin)	1
			(2)

Question Number	Correct Answer	Extra Information	Mark
5 (b)	(large) current/flow of charge in earth wire		1
	melts fuse (wire) (in plug) and cuts off the supply/electricity/current	both required for this mark	1
			(2)

Question Number	Correct Answer	Extra Information	Mark
5 (c)	200 (V)	allow (1) mark for just	
		$(V =) 0.02 \times 10000$	(2)

Question Number	Correct Answer	Extra Information	Mark
6 (a) (i)	left to right		(1)

Question Number	Correct Answer	Extra Information	Mark
6 (a) (ii)	electrons have - ve charge		1
	flow from - ve and / or to + ve		1
			(2)

Question Number	Correct Answer	Extra Information	Mark
6 (b) (i)	0.20 x 3.0 x 240	$0.2 \times 3 \times 4 = 2.4$	1
	= 144 (J)	scores (0/2)	1
		, , ,	(2)

Question Number	Correct Answer	Extra Information	Mark
6 (b) (ii)	thermal/heat		(1)

Question	Correct Answer	Extra Information	Mark
Number			
6 (c) (i)	0.10 x 1.5 x 240	ecf from (b)(i) e.g	
	= 36 (J) / quartered	0.6(J)	
			(2)

Question Number	Correct Answer	Extra Information	Mark
6 (c) (ii)	/halved (Vhalved)		(1)

Question Number	Correct Answer	Extra Information	Mark
7 (a) (i)	I correctly labelled		(1)
Question Number	Correct Answer	Extra Information	Mark
7 (a) (ii)	R correctly labelled		(1)
Question Number	Correct Answer	Extra Information	Mark
7 (a) (iii)	C correctly labelled		(1)
Question Number	Correct Answer	Extra Information	Mark
7 (b) (i)	angle at which refraction still/just occurs		(1)
Question Number	Correct Answer	Extra Information	Mark
7 (b) (ii)	sin c = 1/n		(1)
Question Number	Correct Answer	Extra Information	Mark
7 (b) (iii)	c = 38.7(°)		(1)
Question Number	Correct Answer	Extra Information	Mark
7 (c) (i)	bends more towards normal		1
	reflects correctly at glass-air dop		1 (2)
Question Number	Correct Answer	Extra Information	Mark
7 (c) (ii)	dop refracts more / bends more total internal reflection	i > c	1 1 (2)

Question Number	Correct Answer	Extra Information	Mark
8 (a)	150 ×100 = 120 × p	150 x 100 = 30 x p	1
	p = 125 (kPa)	p = 500(kPa) scores	1
		1	(2)

Question Number	Correct Answer	Extra Information	Mark
8 (b)	constant mass of gas	no leaks in or out owtte	(1)

Question Number	Correct Answer	Extra Information	Mark
8 (c) (i)	bigger		(1)

Question	Correct Answer	Extra Information	Mark
Number			
8 (c) (ii)	dop		1
	inc in temp		1
	molecules move faster owtte		
			(2)

Question	Correct Answer	Extra Information	Mark
Number			
9 (a) (i)	alpha	allow 'helium	
		nucleus'	
		or He with	
		subscript and	(4)
		superscript	(1)
Question	Correct Answer	Extra Information	Mark
Number	COTTECT AIRSTYCE	Extra information	Mark
9 (a) (ii)	gold nucleus	accept 'metal	
		nucleus'	(1)
	T		1
Question	Correct Answer	Extra Information	Mark
Number 9 (b) (i)	camo	both a or both	
9 (b) (l)	same	both + <u>or</u> both -	(1)
	.		(1)
Question	Correct Answer	Extra Information	Mark
Number			
9 (b) (ii)	repulsion		
			(1)
Question	Correct Answer	Extra Information	Mark
Number	Correct Aliswei	LXCI a IIII OI III acioii	Mark
9 (c) (i)	using sensible scales and correct orientation		1
(4) (7)	3		
	axes labelled with quantities and units	minimum S/° and	1
		d/fm	
	all points plotted correctly	± 1 mm (-1) per	2
	amaath augus	misplot	1
	smooth curve		(5)
	.		(3)
Question	Correct Answer	Extra Information	Mark
Number			
9 (c) (ii)	35 ±1 (°)		
			(1)
Question	Correct Answer	Extra Information	Mark
Number	Correct Aliswei	LACIA IIIIOIIIIACIOII	Maik
9 (d)	0°		1
, (-)	above 90°		1
			(2)
Question	Correct Answer	Extra Information	Mark
Number	and this stip and the		
9 (e) (i)	speed/ kinetic energy	momentum	

(1)

Question Number	Correct Answer	Extra Information	Mark
9 (e) (ii)	(alpha) not diverted from its path by <u>particles</u> in air		(1)

Question Number	Correct Answer	Extra Information	Mark
9 (f)	nuclear	allow 'nucleus'	(1)

Question Number	Correct Answer	Extra Information	Mark
10 (a) (i)	1		1
	0		1
	independent marks		(2)

Question	Correct Answer	Extra Information	Mark
Number			
10 (a) (ii)	neutron		
			(1)

Question Number	Correct Answer	Extra Information	Mark
10 (b) (i)	₋₁ β ⁰		1
	241	ecf	1
	95		1
			(3)

Question Number	Correct Answer	Extra Information	Mark
10 (b) (ii)	americium Am	only allow Np, Pu, Am, Cu	(1)

Number Til (a) (i) Slope/gradient (1)	Question	Correct Answer	Extra Information	Mark
Question Number	Number 11 (a) (i)	slope/gradient		
Number 11 (a) (ii) area (under graph) (1) Question Number Correct Answer Extra Information Mark 11 (b) (i) no (1) Question Number Correct Answer Extra Information Mark 11 (b) (ii) dop graph not horizontal or velocity not constant or (still) accelerating (1) Question Number Correct Answer Extra Information Mark 11 (c) (i) A (1) Question Number Correct Answer Extra Information Mark 11 (c) (ii) D (1) Question Number Correct Answer Extra Information Mark 11 (c) (iii) C (1) Question Number Correct Answer Extra Information Mark 11 (d) • constant velocity terminal velocity 1 • equal 1 1 • no acceleration Extra Information Mark Question Number Correct Answer Extra Information Mark 11 (e) greater area under graph before sea 1 1				(1)
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