

# IGCSE Double Award Science (Physics) 4437/3F

## Mark Scheme (Results)

### November 2008

IGCSE

## IGCSE Double Award Science - Physics (4437/3F)

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	Notes	Mark
1 (a)	infra-red		(1)

Question Number	Correct Answer	Notes	Mark
1 (b)	wavelength frequency speed		1 1 1 (3)

Question Number	Correct Answer	Notes	Mark
1 (c)	cooking or satellite transmission	accept 'used to make food hot' owtte	(1)

Question Number	Correct Answer	Notes	Mark
1 (d)	internal heating of body tissue owtte	do not accept 'burns'	(1)

Question Number	Correct Answer	Notes	Mark
1 (e)	visible or radio		(1)

(Total 7 marks)

Question Number	Correct Answer	Notes	Mark
2 (a) (i)	distance and time labelled		(1)

Question Number	Correct Answer	Notes	Mark
2 (a) (ii)	D C A	accept word descriptions unambiguously positioned	1 1 1 (3)

Question Number	Correct Answer	Notes	Mark
2 (b)	1 000 000 / million		(1)

(Total 5 marks)

Question Number	Correct Answer	Notes	Mark
3 (a)	convection radiation evaporation	Any two	(2)

Question Number	Correct Answer	Notes	Mark
3 (b)	reflector radiation		1 1 (2)

Question Number	Correct Answer	Notes	Mark
3 (c) (i)	walls roof windows floor door chimney	Any two	(2)

Question Number	Correct Answer	Notes	Mark
3 (c) (ii)	any heat insulator e.g. air fibre glass	accept 'double glazing', 'carpets', 'curtains' etc	(1)

(Total 7 marks)

Question Number	Correct Answer	Notes	Mark
4 (a)	3 crosses or any 2 crosses (2) any 1 cross (1)		(2)

Question Number	Correct Answer	Notes	Mark
4 (b)	234 - 92 = 142	2nd mark scores both	1 1 (2)

Question Number	Correct Answer	Notes	Mark
4 (c) (i)	protons neutrons/nucleons <i>independent marks</i>		1 1 (2)

Question Number	Correct Answer	Notes	Mark
4 (c) (ii)	Both Hs		(1)

(Total 7 marks)

Question Number	Correct Answer	Notes	Mark
5 (a)	reduces halves	2nd point scores both marks	1 1 (2)

Question Number	Correct Answer	Notes	Mark
5 (b)	increase voltage double / make it 9 V	ecf from (a) 2 <sup>nd</sup> point scores both marks	1 1 (2)

Question Number	Correct Answer	Notes	Mark
5 (c)	parallel		(1)

Question Number	Correct Answer	Notes	Mark
5 (d) (i)	diode	allow LED	(1)

Question Number	Correct Answer	Notes	Mark
5 (d) (ii)	in a correct place right way round to stop current <i>independent marks</i>		1 1 (2)

(Total 8 marks)

Question Number	Correct Answer	Notes	Mark
6 (a)	Road condition		(1)
	Reaction time	✓	
	Speed of car		

Question Number	Correct Answer	Notes	Mark
6 (b)	average speed = distance ÷ time		(1)

Question Number	Correct Answer	Notes	Mark
6 (c)	Road condition	✓	Two correct 2 one correct 1 (2)
	Reaction time		
	Speed of car	✓	

Question Number	Correct Answer	Notes	Mark
6 (d)	(travelling) faster		(1)

Question Number	Correct Answer	Notes	Mark
6 (e) (i)	plot points		2
	straight line		1
			(3)

Question Number	Correct Answer	Notes	Mark
6 (e) (ii)	7.5 (m)	accept range 7.4 - 7.6	(1)

Question Number	Correct Answer	Notes	Mark
6 (e) (iii)	36 - 12		1
	= 24 (m)		1
			(2)

(Total 11 marks)



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

Question Number	Correct Answer	Notes	Mark
7 (b) (i)	voltmeter voltage/potential difference/p.d.	both parts required do not accept voltmeter voltemeter voltage meter etc	(1)

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

(Total 6 marks)

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

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

Question Number	Correct Answer	Notes	Mark
8 (c)	information	allow: data /signal	(1)

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

(Total 6 marks)

Question Number	Correct Answer	Notes	Mark
9 (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	Notes	Mark
9 (b)	(efficiency)  = $\frac{\text{useful (energy) output}}{\text{total (energy) output/input}} (\times 100\%)$		(1)

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

(Total 6 marks)

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

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

Question Number	Correct Answer	Notes	Mark
10 (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	Notes	Mark
10 (b) (iii)	(the card and)the metal will not reduce (or stop) the radiation/emission/count rate/reading from gamma / $\gamma$ (radiation)	or words to that effect	(1)

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

(Total 6 marks)

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

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

Question Number	Correct Answer	Notes	Mark
11 (c)	200 (V)	allow (1) mark for just $(V = ) 0.02 \times$ 10 000	(2)

(Total 6 marks)