

# IGCSE Physics 4420 1F Mark Scheme (Results) Summer 2008

IGCSE

## IGCSE Physics 4420 1F



## IGCSE PHYSICS 4420-1F MARK SCHEME

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Abbreviations used in mark schemes:

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		sloping and horizontal	1
	straight		horizontal	1
	independent marks but sloping and horizontal scores (0)			(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	in either order		1
	information			1 (2)

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

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

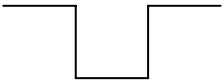
Question Number	Correct Answer	Acceptable Answers	Reject	Mark
6 (b)(ii)	B / ultra violet			(1)

(Total 5 marks)



Question Number	Correct Answer	Acceptable Answers	Reject	Mark
7 (a)(i)	continuously	continually		(1)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
7 (a)(ii)	1 0	both either way round accept 'on' and 'off' accept 'high' and 'low'		(1)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
7 (b)	first horizontal line in high position	ignore any missing vertical lines		1
				1
	next horizontal line in low position			1
	next horizontal line in high position			(3)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
7 (c)	easier to build/design/regenerate/amplify /clean up/ less noise /carry more information.			(1)

(Total 6 marks)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
8 (a)	boiling	evaporation		(1)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
8 (b)	four particles shown			1
	smaller spacing than gas shown			1
	free movement shown			1
				(3)

(Total 4 marks)

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

Question Number	Correct Answer	Acceptable Answers	Mark
9 (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
9 (a)(iii)	<i>one line</i>		1
	horizontal line beyond 0.8		1
	less steep slope down (to the x axis) dop	<i>two separate lines or one of these lines</i>	
		<u>labelled</u> 1 mark for each correct	(2)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
9 (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
9 (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
10 (a)(i)	infra red  <i>allow phonetic spelling</i>	i.r. IR	microwaves ultraviolet	1  (1)

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

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

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
10 (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  <i>S waves ignore 'seismic'</i>  mexican wave	P waves analogue wave waves on a CRO	1  (1)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
10 (b)(iii)	90°  <i>energy independent marks</i>	normal/ perpendicular 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
11 (a)(i)	voltage = current × resistance or current = voltage/resistance or resistance = voltage/current	$V = IR$ $I = V/R$ $R = V/I$	$V = C \times R$	1 (1)
11 (a)(ii)	4.5 nwn  volts or V or J/C or $JC^{-1}$ or $A\Omega$			1  1 (2)

Question Number	Correct Answer	Acceptable Answers	Mark
11 (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	Acceptable Answers	Reject	Mark
13 (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
13 (a)(ii)	-273 (°C)	minus 273 -273.15	1 (1)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
13 (a)(iii)	373 (K)	373.15(K)	373°C	1 (1)

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

(Total 6 marks)

Question Number	Correct Answer	Acceptable Answers	Mark
14 (a)(i)	electrons    electrons	both required	1 (1)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
14 (a)(ii)	<i>points in either order</i> polythene is an (electrical) insulator  (so) slow to discharge /retains charge	poor / bad (electrical) conductor  'charge (or electrons)leak away /move slowly (to earth)'	poor conductor of heat	1  1  (2)
14 (a)(iii)	copper is an (electrical) conductor (so charge is earthed)		copper is a good conductor of heat	1  (1)

Question Number	Correct Answer	Reject	Mark
14 (b)	spark/sparking	flame	1 (1)

(Total 5 marks)



Question Number	Correct Answer	Acceptable Answers	Mark
15 (a)	clear indication on the graph that a suitable interval has been chosen		1
	1 ½ (hours)	i.e. an interval between a value and half that value	1
	90 (minutes)	87 93 or 96 ecf conversion of previous answer to minutes	1
			(3)

Question Number	Correct Answer	Reject	Mark
15 (b)	<i>any <u>two</u> points</i>		
	(isotope) ingested / swallowed/eaten /taken in /injected		1
	(gamma) radiation emitted	X-rays alpha beta	1
	trace / track / detect (radiation) / follow progress		1
			(2)

(Total 5 marks)

Question Number	Correct Answer	Acceptable Answers	Mark
16 (a)	induced		1
	magnetic field	flux (linkage)	1
	responses only in this order		(2)

Question Number	Correct Answer	Acceptable Answers	Mark
16 (b)	$\frac{\text{(number of ) primary turns}}{\text{(number of) secondary turns}}$	$\frac{\text{primary coils}}{\text{secondary coils}}$ $= I_s / I_p$	1 (1)

Question Number	Correct Answer	Mark
16(c)(i)	Just before the transmission line	1 (1)

Question Number	Correct Answer	Mark
16c)(ii)	Just after the transmission line	1 (1)

(Total 5 marks)

PAPER TOTAL 100 MARKS