IGCSE Physics DA 4437 3F
Mark Scheme (Results)
Summer 2007

IGCSE

IGCSE Physics DA 4437 3F

Question 1			
Qu part	Answer(s)	Extra Information	Mark(s)
a (i)	A		1
a (ii)	B		1
b(i)	frequency		1
b(ii)	period		1
c(i)	any two of • gamma • X-rays • ultra violet • (visible) light • infra red • microwaves • radio waves • rope/slinky spring waggled side to side •	Allow 'electromagnetic' for 1 mark but do not award another mark for a part of the electromagnetic spectrum or words to that effect, but not just 'slinky spring'	2
c(ii)	longitudinal (waves)	allow sound waves or slinky spring pushed and pulled	1
			7 marks

Question 2			
Qu part	Answer(s)	Extra Information	Mark(s)
a (i)	case/plug is damaged/broken/has piece missing	fuse/earth exposed	1
a (ii)	could touch inside/live wire/fuse		1
	get (an electric) shock		1
a(iii)	fuse		1
a(iv)	any two of • get hotter • melt • fail to conduct/breaks/switches off •	accept 'get hot' accept 'switch off' ignore effects on glass	2
b(i)	insulator/non-conductor		1
	will not get a shock (if you touch it)	ora	1
(b)(ii)	any two of • has an earth wire /connection/it is earthed • if there is a fault, electricity will go to earth/metal will not be live • will not get a shock if touch it	but not if already credited in (b)(i)	2
			10 marks

Question 3

Qu part	Answer(s)	Extra Information	
A	all points correct	to the nearest mm in any direction and not 'blobs' (more than 1 mm across) deduct (1) for each wrong point to a minimum of zero	3
(b)(i)	answer in range 67 to 68 inclusive	or correct from candidate's graph	1
(b)(ii)	answer in range 2.3 to 2.4 inclusive	or correct from candidate's graph allow 2 hr 18 m – 2 hr 24 m	1
c	(average) speed = distance (moved) ÷ time (taken)	or correctly transposed version allow use of letters e.g. a = d/t	1
			6 marks

Question 4

Qu part	Answer(s)	Extra Information	Mark(s)
a	insulation		1
	conduction		1
b	… cold … down	both correct for the mark	1
	… warm .. up	may be reversed with the pair above allow 'hot' for 'warm'	1
	… cold … warm **no ecf**	order must be correct but allow 'hot' for 'warm'	1
	convection		1
			6 marks

Question 5

Qu part	Answer(s)	Extra Information	
a	density = mass ÷ volume	or any correctly transposed version do not accept 'weight' for 'mass' allow use of letters	1
b(i)	(volume) = length x thickness x width	or any correctly transposed version accept 'breadth' for 'width' allow use of letters	1
b(ii)	millimetres/mm		1
c	none/no change	accept 'the same'	1
d	2.7 (g/cm^3)	accept 'the same'	1 **5 marks**

Question 6

Qu part	Answer(s)	Extra Information	
a	Z X A	all three correct allow (1) for one or two correct	2
b(i)	proton(s)		1
	nucleus		1
(b)(ii)	neutron(s)		1
(b)(iii)	proton(s) (1) neutron(s) (1)		2
(b)(iv)	… electron(s) … proton(s)	either order	1
b(v)	alpha/α		1
	beta/ß	order of α and ß may be reversed	1
	gamma/γ		1 **11 marks**

Question 7

Qu part	Answer(s)	Extra Information	Mark(s)
a(i)	C		1
a(ii)	sloping downwards	slowing down	1
a(iii)	constant	less than acceleration / decreases slowly / takes a longer time than the acceleration / (area) A is less than (area) C / (train) travels a greater distance while decelerating than when accelerating	1
b(i)	area (under graph)	A + B + C	1
b(ii)	horizontal non zero line		1
	below line on graph	dop	1
	for the correct time	independent	1
			7 marks

Question 8

Qu part	Answer(s)	Extra Information	Mark(s)
a(i)	resistor/resistance/rheostat		1
	power supply/battery/cell		1
a(ii)	= 0.4 × 20		1
	= 8 (C)		1
b	lamp in parallel		1
	switch in series with second lamp	dop	1
			6 marks

Question 9

Qu part	Answer(s)	Extra Information	Mark(s)
a	<u>angle</u> of incidence equals <u>angle</u> of reflection	(angle) i = (angle) r $\hat{i}=\hat{r}$ <i = <r	1
b(i)	correct ray striking window any ray reflected off at correct angle		1
		independent	1
b(ii)	cover <u>outside</u> of window	open/close/tilt window/fit shutters (outside)	1
c(i)	infra-red	i.r ignore heat / radiation	1
c(ii)	ultraviolet	u.v	1
d	(same) speed / velocity	transverse	1
			7 marks

Question 10

Qu part	Answer(s)	Extra Information	Mark(s)
a	50 000J of <u>chemical</u> <u>30 000 J</u> of <u>heat / thermal</u> energy	ignore sound / chemical	1 1 1
b	= 700 × 2 (000) convert km to m = 1 400 000 (J)	1400 (J) scores 2	1 1 1
			6 marks

Question 11			
Qu part	Answer(s)	Extra Information	Mark(s)
a	magnetic field / flux (in coil) changes voltage / current <u>induced</u> / electromagnetic induction / emi	dop	1 1 1
b	pedal faster	more wire on coils use <u>stronger</u> magnet reduce gap(s)	1
			4 marks