



General Certificate of Secondary Education

Physics (Modular) 3453/F *Specification A*

Mark Scheme

2006 examination – June series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

GCSE PHYSICS (MODULAR) 3453/F
MARK SCHEME – FOUNDATION TIER (TERMINAL PAPER)
SUMMER 2006

3453/F Q1

	answers	extra information	mark
(a)	weight		1
(b)	accelerating (1) downwards (1)	accept speeding up/getting faster accept falling	2
(c) (i)	$W = 55 \times 10$ (1) $= 550$ (N) (1)	$W = 550$ (N) gains 2 marks accept 539 or 539.55	2
(ii)	their answer to (i)	550 (N) gets 1 mark even if not same as (i)	1
total			6

3453/F Q2

	answers	extra information	mark
(a) (i)	Moon		1
(ii)	Mars		1
(iii)	Comet		1
(iv)	Milky Way		1
(b) (i)	(Earth's) gravity	accept gravitational (pull) accept centripetal	1
(ii)	400		1
total			6

3453/F Q3

	answers	extra information	mark
(a) (i)	amplitude		1
(ii)	wavelength		1
(iii)	frequency		1
(iv)	energy		1
(b) (i)	sound		1
(ii)	X-rays		1
(iii)	between gamma and UV		1
(c) (i)	ultraviolet		1
(ii)	X-rays	accept gamma	1
total			9

3453/F Q4

	answers	extra information	mark
(a) (i)	alpha; beta; gamma	any order – <u>must have all 3</u> accept correct symbols	1
(ii)	gamma	accept correct symbols	1
(iii)	alpha	accept correct symbols	1
(b) (i)	beta	accept correct symbols	1
(ii)	the nucleus	accept 'nuclei'	1
(iii)	needle drawn to left of 500	between 0-500	1
total			6

3453/F Q5

	answers	extra information	mark
(a)	weight	do not accept mass accept gravitational pull/force	1
(b) (i)	arrow to left	accept curve or straight arrow	1
(ii)	arrow to right	accept curve or straight arrow	1
(c)	X is (directly) below pt. of suspension (owtte) weight of sheet has no turning effect about pivot/ pin Quality of written communication Correct use of scientific term - moment	accept reverse statement	2 1
total			6

3453/F Q6

	answers	extra information	mark
(a) (i)	B		1
(ii)	A		1
(iii)	D		1
(b)	iron/Fe nickel/Ni	either order	1 1
(c)	larger than the density of A		1
total			6

3453/F Q7

	answers	extra information	mark
	lines from:		
	• catapult to elastic potential to kinetic		1
	• kettle to electrical to heat		1
	• solar cell to light to electrical		1
	• wind turbine to kinetic to electrical		1
total			4

3453/F Q8

	answers	extra information	mark
(a)	P a thermistor		1
	Q an LDR	light dependent resistor	1
	R a relay	<u>magnetic</u> switch	1
	S an LED	light emitting diode	1
(b) (i)	Q	accept LDR/light dependent resistor	1
(ii)	P	accept thermistor	1
(iii)	S	accept LED/light emitting diode	1
total			7

3453/F Q9

	answers	extra information	mark
(a) (i)	SETI/search for extraterrestrial intelligence		1
(ii)	a <u>radio</u> telescope/dish	do not accept robot/satellite/ radio set/computer	1
(b)	any three from <ul style="list-style-type: none"> • (living) organisms/microbes/bacteria/ microorganisms • fossils/ <u>fossilised</u> footprints/bones/plants • oxygen/atmosphere similar to Earth • water/ice 	1 mark each accept formations caused <u>by water</u>	3
total			5

3453/F Q11

	answers	extra information	mark
(a) (i)	transverse		1
(ii)	longitudinal/compression		1
(b)	any two from <ul style="list-style-type: none"> • microwaves carry/transfer energy • microwaves <u>absorbed by water</u> (molecules) • water becomes hot/ molecules/particles vibrate <u>faster/more</u> 	1 mark each do not accept molecules heat up	2
(c)	any two from <ul style="list-style-type: none"> • have the same/similar velocity • can travel through a vacuum • both transverse waves • have similar frequency/wavelengths 	1 mark each, any order accept speed accept (empty) space both electro-magnetic waves lower/longer than	2
(d)	can be absorbed by water <u>in cells/ tissue/organs</u> (1) cells/tissue/organs may be damaged (1)	accept taken in accept heat water <u>in cells/body</u> accept killed or destroyed ignore ref to burns or cancer	2
total			8

3453/F Q12

	answers	extra information	mark
(a) (i)	arrow towards centre		1
(ii)	arrow towards centre		1
(iii)	arrow towards centre		1
(b)	number of passengers may be greater	heavier passengers	1
	greater mass		1
(c) (i)	make it travel faster	larger speed/velocity/decrease time for rotation	1
(ii)	force would be greater		1
	force depends on velocity	$F = \frac{mv^2}{r}$	1
total			8

3453/F Q13

	answers	extra information	mark
(a) (i)	have shapes/coastlines which fit (quite closely) (owtte)	any order	1
	have similar rocks/fossils	do not accept same animals	1
(ii)	shrinking of Earth		1
	when it cooled		1
(b) (i)	(large) pieces of Earth's lithosphere/crust/ <u>upper</u> mantle		1
(ii)	convection currents (1)	or a correct description	1
	either in (Earth's) mantle/magma (1)		1
	or driven by heat released through (natural) radioactivity	not nuclear reactions	
total			7

3453/F Q14

	answers	extra information	mark
(a)	any three from <ul style="list-style-type: none"> • increase the speed of rotation • increase (strength of) magnetic field • increase the number of <u>turns</u> (on coil) • increase <u>area</u> of coil 	1 mark each, any order accept stronger/more (powerful) magnets; reduce gap between magnets; iron core do not accept bigger magnets more coils insufficient	3
(b)	(increased) global warming (1) produces acid rain (1)	accept greenhouse effect/gases do not accept damage to ozone layer	2
total			5