

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

SCIENCE: DOUBLE AWARD A Paper 5 1983/5 PHYSICS Paper 1 1982/1

FOUNDATION TIER

MARK SCHEME

Specimen Paper 2003

Qn	Expected answer	Marks	Additional guidance
1 a i	infra red / microwaves	1	Allow IR
ii	ultra violet	1	Allow UV
iii	X-rays	1	Allow gamma / right hand side
b	infra red (1) visible light (1) ultra violet (1)	3	
С	tracers (1) to test flow (1) killing / treating / cure (1) cancer / tumour unwanted cells (1) sterilising (1) medical equipment (1)	2	Allow any other known use helping cancer = 0 sterilising non-medical equipment = 0 radiotherapy = 1
d i	passes through flesh / skin (1) absorbed / stopped by bone (1) indication of change on film (1) any two QWC = 1 This mark should only be awarded if the answer given by the candidate attempts to address the question and the quality of the description	2	Not reflects from base
	makes the meaning clear		
ii	shielding (e.g. lead apron) / leave room / wear film badge (owtte) (1)	1	Minimum density of shielding - iron
e i	damage to cells (1) ionisation of cells (1) can cause cancer / tumour (1) any two	2	
ii	gamma (1)	1	Or uv
		(15)	

Qn	Expected answer	Marks	Additional guidance
2 a i	live (1) neutral (1) earth (1) (any order)	3	
ii	brown	1	
iii	break circuit / blows / melts (1) if too much <u>current</u> (1)	2	Reject blows up Reject too powerful Reject too much electricity
			Allow too many amps
b i	2 x 6/60 / 2 x 0.1 (1) 0.2 (1)	2	
ii	2	1	Allow ecf if 10 x b i
С	implied separate casings (1) insulation between them (1) no earth wire / owtte (1) any two	2	Reject two layers of insulation Allow insulating case
	QWC = 1 This mark should only be awarded if the answer given by the candidate attempts to address the question and the quality of the description makes the meaning clear.	1	
		(12)	
3 a	straight ray from crown reflecting at surface to Queen's eye (1) angles equal (1) arrow(s) in correct direction (1)	3	Check straightness of ray by eye only Range for point of incidence defined At least one arrow
b i	ray continued to surface (1) joined to King's eye (1)	2	
ii	refracts / changes direction / bends (1) speeds up (1) goes into less dense material (1) any two.	2 (7)	

Qn	Expected answer	Marks	Additional guidance
4 a	Earth	1	
b	further to travel round / larger orbit (1) further away from Sun / larger radius / further out (1) travels slower (1) less gravitational pull/force from Sun (1) any two .	2	Reject less gravity
c i	single smooth curve of best fit	1	need not go back to origin
ii	5 ± 0.5 (1) indication on graph how answer obtained ecf (1)	2	Minimum indication is line/dot/cross between 420 and 440
d i	satellite	1	
ii	Gravity	1	All pull of Ida Reject pull
е	See surface clearly (1) No reflection of sunlight off gases/ vapour (1) Surface is pock marked with craters (1) Meteorites would burn up (1) Any three QWC = 1 This mark should only be awarded if the candidate attempts to address the question using a correctly constructed sentence.	3 1 (12)	

	Q	n	Expected answer	Marks	Additional guidance
5	а	i	heat (1) steam (1)	2	
		ii	steam	1	
		iii	cool / condenses / turns back to water / gives out heat	1	
	b	i	raise temperature / warm the water / heat water	1	
		ii	mention of effect on river life consequential to (i) e.g. kill fish , more fish , less fish , more algae	1	
	С	i	current / voltage (induced)	1	Reject produces electricity Reject electricity flows Allow charge/electron flow
		ii	magnetic field lines cut conductor / field changes	1	Accept magnetism changes (in coil)
	d		cables have resistance (1) power loss is in form of heat / lines get hot (1) larger current more power loss / heat loss / energy loss/(1) step up transformers increase voltage (1) increasing voltage reduces current (1) idea of less energy loss / power loss / I ² R (1) any four	4	
			QWC = 1 This mark should only be awarded if appropriate scientific terminology is used with correct spelling, punctuation and grammar.	1	
			, , ,	(13)	
6	а		bottom box 0.2 A (1) right box 0.6 A (1)	2	
	b	I	symbol for voltmeter anywhere in circuit(1) in parallel with lamp (1)	2	Incorrect symbol in parallel with lamp scores 1
		ii	power = voltage x current / P = IV / formula implied (1) = 10 x 0.4 (1) = 4 (1) W (1)	4	

(8)

Qn	Expected answer	Marks	Additional guidance
7 a	cosmic rays / Sun (1) rocks / granite (1) power stations (1) radon (1) fallout / nuclear accidents (1) nuclear weapons testing / atomic bombs (1)	2	Reject building materials Do not allow irradiated food or similar Accept nuclear waste
	any two		
b	distance / use tongs (1) suitable reference to shielding (1) short time of exposure (1) minimum source strength (1) pupils not to handle source (1) direction of pointing source (1)	2	Lead apron should be thick or dense Reject other protective clothing
	any two		
С	120 60 30 15 0 0	1	Any 5 correct
d I	five points correctly plotted / ecf	1	Points to be within ½ square Points to be visible
ii	single line smooth curve of best fit	1	
e I	beta radiation will not pass through / stopped by 20 mm thick sheet / sheet too thick / owtte	1	
e ii	gamma / X-rays	1	
		(9)	
8 a i	clean / non-polluting / free energy / saves fossil fuels / renewable / qualified reference to cost	1	Reject environmentally friendly Reject cheaper Reject cheaper source of electricity
ii	so lots of sunshine hits it	1	
iii	Sun does not always shine	1	Allow expensive installation cost
b	5000/20000 (1) 0.25 / 25% (1)	2	
		(5)	

	Qn	Expected answer	Marks	Additional guidance
9	а	15	1	
	b	55± 1	1	
	С	36 53 / ecf 73 / ecf 96	1	All correct
	d	road surface / wet or dry (1) load (1) tyre condition (1) brake condition / type of brakes / abs (1) reaction time affected by drugs / alcohol / tired (1)	2	
		any two	(5)	
10	a I	tick in second box	1	
	ii	like / similar / same (1) charge (1)	2	
	b I	attraction / touch / hit	1	
	ii	unlike charges / one positive and one negative	1	
			(5)	
11	a	idea of electromagnet/iron magnetised by the current (1) attracts <u>iron bar</u> (1)	1	Emphasis on electromagnetism REJECT 'current through iron REJECT 'attract hammer'
	b	Circuit breaks/current stops (1) Iron demagnetised/electromagnet stops working (1)		
		Spring pulls back (1)	3	
			(5)	
12	2 a	Speed = distance / time (1) 1500 (1)	2	
	b	Shorter / less (1) Less distance / fish near (1)	2 (4)	Accept: faster / quicker