

GCSE

Physics B

Unit B752/01: Unit 2 – Modules P4, P5, P6 (Foundation Tier)

General Certificate of Secondary Education

Mark Scheme for June 2014

Oxford Cambridge and RSA Examinations

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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Mark Scheme

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Annotations used in scoris

Annotation	Meaning	1	
BP	Blank Page – this annotation must be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.		
	correct response		Formatted: Font color: Auto
×	incorrect response		Formatted: Font color: Auto
BOD	benefit of the doubt		Formatted: Font color: Auto
NBOD	benefit of the doubt <u>not</u> given		Formatted: Font color: Auto
ECF	error carried forward		Formatted: Font color: Auto
	information omitted		Formatted: Font color: Auto
I	ignore		Formatted: Font color: Auto
R	reject		Formatted: Font color: Auto
CON	contradiction		Formatted: Font color: Auto

Abbreviations, annotations and conventions used in the detailed Mark Scheme.

- = alternative and acceptable answers for the same marking point
- (1) = separates marking points
- **allow** = answers that can be accepted
- **not** = answers which are not worthy of credit
- **reject** = answers which are not worthy of credit
- **ignore** = statements which are irrelevant
- () = words which are not essential to gain credit
- = underlined words must be present in answer to score a mark (although not correctly spelt unless otherwise stated)
- ecf = error carried forward
- AW = alternative wording

Mark Scheme

June 2014

ora = or reverse argument

	B752/	01	M	ark Sche	me J	une 2014		
I	Quest	ion	Answer	Marks	Guidance			Formatted: Font: 11 pt, Font color:
	1 a	i	B [1] wavelength [1]	1	more than one scores 0 marks if answer line blank allow correct answer indicated in list or diagram	on		Black
	b		<u>no (no mark)</u>	<u>2</u> 2	<u>_'yes' scores [0]</u>			Formatted: Font color: Black
					Aallow (idea that) 25 000 (Hz) is higher than we can hear	1]		Formatted: Font color: Black
			(idea that) we can't hear high pitched sounds [1]		Aallow frequencies above a threshold:		\sum	Formatted: Font color: Black
			BUT		eg. Can't near above 18 000 (Hz)[1]		\backslash	Formatted: Font color: Black
								Formatted: Font color: Black
			We cannot hear 20 000 (Hz) (or above) scores [2]		Aallow 20kHz			Formatted: Font color: Black
			po (no mark)		Aallow correct references to wavelength for [1]			Formatted: Font color: Black
			(idea that) humans cannot hear high pitched sounds cannot frequency or 25 000 (Hz) is high er than humans can hear / [1]					Formatted: Font: 11 pt, Font color: Black
			we cannot detect frequencies above 20 000 Hz / (idea that) humans cannot hear sounds above 20 000 Hz [2]					Formatted: Font: 11 pt, Font color: Black
	С		any two from	2				
			so doctor knows where / what the problem is [1]		allow so the doctor know where to make the cut in the skin	[1]		
			so doctor knows what the problem is/to diagnose the		allow so the doctor knows how big to make the cut -or_if the	ne		Formatted: Font: 11 pt, Font color:
			problem [1]		problem can be treated by keyhole surgery [1]			Black
			so the doctor knows how severe / bad the problem is					

B752/01	Mark Scheme			une 2014	
	[1] so the doctor knows if an (surgical) operation is needed/AW [1]		allow it is safer than invasive surgery to see the problem [1	1	Formatted: Font color: Black
	Total	6			
•					Formatted: Font color: Black
_					 Formatted: Font color: Black

Question Answer Marks Quidance 2 [Level 3] Calculate two resistances correctly AND Identifies how current and resistance changes with length of resistance wire AND Quality of written communication does not impede communication of the science at this level Calculate two resistances correctly AND Identifies how current or resistance changes with length of resistances wire Q.R how resistance changes with length of resistance correctly (3 - 4 marks) [Level 1] 6 This question is targeted at grades up to C. To reach L3 both resistances must be calculated correctly. Indicative scientific points at level 3 may include: both calculations and descriptions from level 1 and 2 and • example of a quantitative relationship e.g. doubling the length of the resistance wire approximately doubles the resistance for length 20 cm = 3(.00)(ohms) • resistance for length 20 cm = 3(.00)(ohms) • resistance for length 10 cm = 1.5(0) (ohms) • resistance for length 10 cm = 1.5(0) (ohms) • resistance for length 10 cm = 1.5(0) (ohms) • resistance increases the communication of the science at this level (3 - 4 marks) [Level 1] Calculate at least one resistance correctly OR Identifies how current or resistance changes with length of resistance increases with length of resistance at this level (1 - 2 marks) [Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks) Formatted: Fort: Out with communication in pedes communication of the science at this level (1 - 2 marks) <td< th=""><th>B752/01</th><th>Ма</th><th>rk Schei</th><th>ne June</th><th>2014</th><th></th></td<>	B752/01	Ма	rk Schei	ne June	2014	
2 [Level 3] 6 This question is targeted at grades up to C. AND To reach L3 both resistances must be calculated correctly. Formatted: Font: AND identifies how current and resistance dues with length of resistances must be calculated correctly. Indicative scientific points at level 3 may include: Formatted: Font: Quality of written communication does not impede communication of the science at this level (so - 6 marks) [Level 2] Indicative scientific points at level 1 and 2 may include: Formatted: Font: Calculate two resistances correctly AND (so - 6 marks) Indicative scientific points at level 1 and 2 may include: Formatted: Font: Calculate two resistances correctly AND (so - 6 marks) Indicative scientific points at level 1 and 2 may include: Formatted: Font: Calculate two resistances correctly AND (so - 6 marks) Indicative scientific points at level 1 and 2 may include: Formatted: Font: Quality of written communication party impedes communication of the science at this level (a - 4 marks) Idea that as length of resistance wire increases the current or resistance correctly (or a marks) Idea that as length of resistance wire increases the correctise of resistance wire increases to rea Formatted: Font: Color: Black Quality of written communication impedes communication of the science at this level (1 - 2 marks) In 2 marks) <	Question	Answer	Marks	Guidance		
Calculate two resistances correctly AND identifies how current or resistance changes with length of resistance wire OR how resistance changes with length of resistance wire Quality of written communication partly impedes communication of the science at this level (3 - 4 marks) resistance for length 20 cm = 3(.00)(ohms) jdea that as length 10 cm = 1.5(0) (ohms) jdea that as length of resistance wire increases the current decreases / ora Formatted: Font: Color: Black Image: Communication of the science at this level (3 - 4 marks) (jdea that as length of resistance wire increases the resistance increases / ora Formatted: Font: Color: Black Use the L1, L2, L3 annotations in scoris. Do not use ticks. Formatted: Font: Color: Black Formatted: Font: (1 - 2 marks) (1 - 2 marks) [Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (1 - 2 marks) [Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	2	[Level 3] Calculate two resistances correctly AND identifies how current and resistance changes with length of resistance wire AND gives a basic quantitative relationship Quality of written communication does not impede communication of the science at this level (5 – 6 marks) [Level 2]	6	 This question is targeted at grades up to C. <u>To reach L3 both resistances must be calculated correctly</u> Indicative scientific points at level 3 may include: both calculations and descriptions from level 1 and 2 and <u>example of a quantitative relationship e.g. doubling the length of the resistance wire approximately doubles the resistance</u> Indicative scientific points at level 1 and 2 may include: 		Formatted: Font: Bold, Font color: Black Formatted: Font: Arial, 11 pt, Font color: Black
 Idea that as length of resistance wire OR how resistance wire Changes with length of resistance wire Quality of written communication partly impedes communication of the science at this level (3 - 4 marks) [Level 1] Calculate at least one resistance changes with length of resistance wire Quality of written communication impedes communication of the science at this level (1 - 2 marks) [Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks) 		Calculate two resistances correctly AND identifies how current or resistance changes with		 resistance for length 20 cm = 3(.00)(ohms) resistance for length 10 cm = 1.5(0) (ohms) 		Formatted: Font: Arial, 11 pt, Font color: Black
 <u>changes with length of resistance wire</u> Quality of written communication partly impedes communication of the science at this level (3 - 4 marks) <u>[Level 1]</u> Calculate at least one resistance correctly OR identifies how current or resistance changes with length of resistance wire Quality of written communication impedes communication of the science at this level (1 - 2 marks) <u>[Level 0]</u> Insufficient or irrelevant science. Answer not worthy of credit. <u>(0 marks)</u> 		length of resistance wire <u>OR how resistance</u>		 Joea that as length of resistance wire increases the currendecreases / ora 		color: Black
[Level 1] Ose the L1, L2, L3 annotations in scorts. Calculate at least one resistance correctly Do not use ticks. OR identifies how current or resistance changes with length of resistance wire Quality of written communication impedes (1 - 2 marks) [Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks) (0 marks)		<u>changes with length of resistance wire</u> Quality of written communication partly impedes communication of the science at this level (3 – 4 marks)		idea that as length of resistance wire increases the resistance increases / ora		Formatted: Font: Arial, 11 pt, Font color: Black Formatted: Font: 11 pt, Font color: Black
identifies how current or resistance changes with length of resistance wire Quality of written communication impedes communication of the science at this level (1 – 2 marks) [Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)		[Level 1] Calculate at least one resistance correctly OB		Do not use ticks.		Formatted: Font: Arial, 11 pt, Font color: Black
		identifies how current or resistance changes with length of resistance wire Quality of written communication impedes communication of the science at this level (1 – 2 marks) [Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)				
Total 6		Total	6			

Mark Scheme

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C	Question	Answer	Marks	Guidance		Formatted: Font: (Default) Times
3	3 a i	(idea that it) varies [1]	1	allow named examples ie it is higher in Finland / Spain [1]		New Roman, 11 pt, Font color: Black
				allow named examples ie it is lower in UK / Austria [1]		
	ii	any one from	1			
		(more) radioactive rocks / uranium in rocks [1]		Consider 'more rocky' / type of rock at SSU		
		(more) granite [1]				
		(more) radon gas [1]				
				allow (more) cosmic rays [1]		
				allow higher level answers in terms of northern lights / near the northern lights [1] but not just Finland is further north / near the north pole		
	b	any one from	1			
		to track dispersal of waste [1]		ignore medical tracersat SSU consider measuring thickness of paper? and use of tracers in a named medical process (not just in		
		to find leaks / blockages in underground pipes [1]		medicine as this is in question 4)		
		to find the route of underground pipes / checking thickness or condition of metal [1]				
		Total	3			

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Question	Answer	Mark <u>s</u>	Guidance		Formatted: Font: 11 pt, Font color: Black
4 a i	Decreases [1]	<u>222</u>			Formatted: Font color: Black
	had a				Formatted: Font color: Black
	but				Formatted: Font color: Black
	decreases by half / by 30 (decays per second) [2]		allow from 60 to 30 [2]		Formatted: Font color: Black
	decreases (by 30) (decays per second) [1]		eg 60 and 30 indicated on graph scores [2]		Formatted: Font color: Black
					Formatted: Font color: Black
	but		it NO marks awarded allow by one half life [1]		
	reduces by half [2] decreases (by 30 (decays per second)) [1]				
	but		allow from 60 to 30 [2]		
			eg 60 and 30 indicated on graph scores [2]		
	reduces by half [2]		But if no other marks seered allow one half life [1]		
			But If no other marks scored allow one nall life [1]	<	Formatted: Font color: Black
			ignore decayed rapidly		Formatted: Font color: Black
					Formatted: Font: 11 pt, Font color: Black
			allow from 60 to 30 [2]		Formatted: Font: Not Bold, Font color: Black
ii	line starting at 120 and always to the right and above	111	Aany line curving upwards (at any part) scores [0]		Formatted: Font color: Black
	right element A [1]		graphs must not cross each other		Formatted: Font color: Black
	of element A [1]		Look at first 4 days of the graph.		Formatted: Font color: Black
	line starting at 120 and decreasing with less steep		NOT positive gradient		Formatted: Font color: Black
	gradient than element A [1]				Formatted: Font color: Black
			- Universide a that) the undiscretivity is not in the healty for a la		Formatted: Font color: Black
ומ	(loea that nuclear radiation) can increase risk of		time(to cause damage) [1]	ong	Formatted: Font color: Black
ii	beta and gamma [1]	1	more than one scores 0 marks		
			if answer line blank allow correct answer indicated in list		

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	Total	5		

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Question	Answer	Marks	Guidance		
5 a	any three from	3	allow marking points from labels on the diagrams		
	spread of (paint) spray less for pormal paint oun /		A allow (paint) spray identified as spreading once it leaves the		 Formatted: Font color: Black
	spread of (paint) spray more for electrostatic paint gun [1]		paint gun [1]		Formatted: Font: 11 pt, Font color: Black
	(idea that) paint (droplets) in normal paint gun uncharged [1]				
	(idea that) <u>paint droplets in electrostatic gun have the</u> <u>same charge [1]</u>				
	(idea that) opposite like charged (paint) particless repel (so spreading the paint further) [1]				
	(idea that) object is charged (oppositely to paint) [1]]				 Formatted: Font: 11 pt, Font color: Black
	(idea that) in electrostatic gun paint droplets are attracted to object [1]				
b	become charged/ loses or gains electrons[1]	2	allow examples of becoming charged e.g. (insulating) mater rubbing together / taking sweater off / walking on carpet [1]	ials	
	<u>ــــــــــــــــــــــــــــــــــــ</u>				 Formatted: Font color: Black
			allow when touching something that is earthed [1]		
	(then) become earthed / charge or <u>electrons</u>		Dur		 Formatted: Font: 11 pt, Font color:
	transferred to make object neutral I J				Formatted: Font color: Black
			allow touching charged object causes current to flow to eart	1	
	Total	5	[24]		 Formatted: Font: 11 pt, Font color: Black
	10(a)				Formatted: Font: Not Bold, Font color: Black
					Formatted: Font color: Black

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Question	Answer	Marks	Guidance		///	Formatted
<u>6</u> a	any 2 from	2				Formatted
	(idea that) actallita has a wide acyarage [1]				$\overline{\langle}$	Formatted
	(idea triat) satellite has a wide coverage [1]				$\langle \rangle$	Formatted
	(idea that) satellite always in same (relative) position				\nearrow	Formatted
	[1]				$\langle \rangle$	Formatted
					$\langle \rangle \rangle$	Formatted
	(idea that) satellite receivers (on the house) don't				())	Formatted
	need to be moved to follow satellite / Avv [1]				\langle / \rangle	Formatted
b.	any 2 from	2			$\left \right\rangle$	Formatted
· · · · · · · · · · · · · · · · · · ·		•			\sum	Formatted
	Short-short waves penetrate atmosphere / Long				()	Formatted
	waves don't penetrate atmosphere / AW [1]				$\left(\right) $	Formatted
	long waves absorbed or reflected or refracted or			\ \	())	Formatted
	reflected (by atmosphere) [1]				$\langle \rangle \rangle$	Formatted
					77,	Formatted
	(therefore) short waves reach the receiver / long				Λ,	Formatted
	waves don't reach the receiver [1]				$\overline{\}$	Formatted
C	Loss loss time [1]	1	allow faster[1]			Formatted
		^ '	allow any time less than 24 hours			Formatted
d ,		3	Maximum two marks from each section		\mathbb{N}^{-}	Formatted
	Risks any one or two from:		allow higher level answers		M	Formatted
	Loss of life / need oxygen or food or water or heat/		A		$\langle \rangle \rangle$	Formatted
	fall back to Earth/ difficult to repair / risk of collision[1]				()	Formatted
					()//	Formatted
	Benefits and uses - any one or two from:					Formatted
	Spying / telecommunication / scientific research /					Formatted
	GPS / imaging of Space / [1]		ignore Satellite TV			Formatted
	<u>۸</u>		Ignore weather forecasts			Formatted
	Total	8	A			Formatted
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Question	Answer	Marks	Guidance		Formatted
7а.	,120 [2]	2	A		Formatted
	But if answer is incorrect or incomplete:				Formatted
	put if answer is incorrect of incomplete.			///	Formatted
	13+ 27 x 6			///	Formatted
	2 scores [1]				Formatted
					Formatted
b	30 (m/s) and speed limit brokenyes [2]	2	allow 'yes' in answer to question		Formatted
	<u>۸</u>		allow higher level answers e.g. she has gone 3m/s over the		Formatted
			speed mmt. [2]		Formatted
	But if answer is incorrect or incomplete up to 1 mark		A		Formatted
	from:				Formatted
	A				Formatted
	30				Formatted
	OB				Formatted
					Formatted
	0 + 3x10				Formatted
	A				Formatted
	OR				Formatted
	3 x 10				Formatted
			'3x10 and ves' [1]		Formatted
	OR				Formatted
	- -				Formatted
	(3x10 and yes' scores [1]				Formatted
	A T-4-1				Formatted
4		4	A		Formatted
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		1				λ	Formatted	
Question	Answer	Marks	Guidance			A	Formatted	
8	1	6	This question is targeted up grade E]///	Â	Formatted	<u></u>
	<u>ــــــــــــــــــــــــــــــــــــ</u>		<u>To reach Level 3 image must be formed on a screen</u>		_///	Λ	Formatted	
	1 ovel 21; (5 - 6 marke)		Indicative scientific points may include:		_//	λ	Formatted	
	Answer describes Describes measurement of		indicative scientific points may include.		_//	1	Formatted	
	image distance AND		Focal length			-	Formatted	
	at least 1 all other key pointsfeature to of the		 focal length is distance between lens and image (or 	a		5	Formatted	
	experiment AND indicates producing an image on		distant object) or distance between lens and focal		H		Formatted	
	paper AND measures image distance with a ruler		point			5	Formatted	
	AND		A				Formatted	
	explains focal length.							
	Quality of written communication does not impede					7	Formatted	(
	communication of the science at this level.		Features of experiment:			Z	Formatted	(
	<u>(5 – 6 marks)</u>		 Intersures thickness of all tenses (with the mini rule produce on image (of the tree on the card) 	2			Formatted	
	[Level 2]		produce an image (or the tree of the card) mossure image distance				Formatted	.
	: (3 – 4 marks)						Formatted	
	Answer indicates Describes at least two features					\mathbf{n}	Formatted	.
	of experiment producing an image on paper AND		Allow for level 1 correct comparison of focal lengths of			Y	Formatted	
	measures image distance with a ruler		lenses			Y	Formatted	
					\mathcal{N}	Y	Formatted	
	OR-OR _				1/ /_	V	Formatted	
	Quality of written communication partly impedee		Use the L1, L2, L3 annotations in Scoris; do not use ticks		_// \	$\langle \rangle$	Formatted	
	communication of the science at this level		This question is targeted up grade E		=\\\\	Y		
	(3 - 4 marks)		Indicative scientific points may include:		-////		Formatted	
					-\III\		Formatted	
	[Level 1] : (1 – 2 marks)		Excal length is distance between lens and image (of a		7/////		Formatted	
	Answer indicates Describes one feature of		distant object)				Formatted	(
	<u>experiment</u>		Measure image distance with rule or ruler			11	Formatted	.
	idea of measuring thicknesses of lenses OR produces		 Produce an image of the tree on the paper 		\\\\ר	11	Formatted	(
	an image on paper OR explains focal length		Try all lenses			11	Formatted	<u> </u>
	communication of the science at this level					Ir	Formatted	 [
	(1 - 2 marke)					IF	Formatted	
					W////		Formatted	
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	Level 0: (0 marks)		Level 2: Produce an image of the tree on the paper			Formatted: Font: 11 pt, Font color: Black
	Insufficient or irrelevant science. Answer not worthy of credit.		AND either Measure image distance with the cm ruler 1. OR explains focal length.	-	$\overline{\langle}$	Formatted: Font: 11 pt, Font color: Black
	<u>۸</u>				\mathbb{N}	Formatted: Font: 11 pt, Font color: Black
			Level 1:			Formatted: Font: 11 pt, Font color: Black
			either measures thickness of all lenses (with the mm ruler)			Formatted: Font: 11 pt, Not Bold, Font color: Black
			OR produces an image on paper OR produces facel length			Formatted: Font: 11 pt, Font color: Black
						Formatted: Font color: Black
			Use the L1, L2, L3 annotations in Scoris; do not use ticl	(S.		Formatted: Bulleted + Level: 1 + Aligned at: 0.63 cm + Indent at: 1.27 cm
	Total	6				Formatted: Font color: Black
	Iotai	0				

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Question	Answer	Marks	Guidance		
9 a	A	<u>2</u> 2	ilgnore references to height		Formatted: Font color: Black
	Maximum range (achieved) at 45° [1]				Formatted: Font color: Black
	BUT				Formatted: Font color: Black
	Range rises with angle until 45° then falls [2]		eg 'the further away from 45° the lower the range scores' [2]		
	Maximum range (achieved) at 45 ^e [1]		if no marks awarded:		
	Range rises with angle until 45 ⁰ then falls [2]		range decreases' [1]		
			eq 'range goes up and then goes down' [1]		
			Ignore references to height		
			allow rises and falls		
			if the angle is too high or too low the range is low(er)[1]		
			Allow as angle increases range decreases (1)		Formatted: Font color: Black
b	90° [1] 90° [1]	14	allow vertical / AW [1]		Formatted: Font color: Black
			allow suitable annotation of the diagram		Formatted: Left
			allow vertical / AW [1]		Formatted: Font color: Black
			allow suitable appotation of the diagram		Formatted: Font color: Black
					Formatted: Font color: Black
			at SSU ask for cropping to include top diagram in case		
			candidates draw their answer on the diagram		
			A at SSLL ook for aronning to include ten diagram in appa		Formatted: Font color: Black
			at 550 dsk for cropping to include top diagram in case		
C i	Parabolic / parabola [1]	,14	jgnore curve / arc / arch on its own		Formatted: Font color: Black
			ignore trajectory		Formatted: Font color: Black
					Formatted: Font color: Black
	Parabolic / parabola [1]		ignore output / are / areb on its own		
			ignore trajectory		
	1		ignore adjointly		

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			ignore curve on its own ignore trajectory		
ii		22			Formatted: Font color: Black
	(Vertical / upward) velocity decreases [1]		Mark points independently:		Formatted: Font color: Black
	Acceleration (remains) constant / AW [1]		eg. vertical velocity and acceleration are reduced for a maximum of [1]		Formatted: Font color: Black
			eg. vertical velocity and acceleration are constant for a maximum of [1]		Formatted: Font color: Black
	<u>ــــــــــــــــــــــــــــــــــــ</u>				Formatted: Font color: Black
			eg. Gravity causes vertical velocity and acceleration are		Formatted: Font color: Black
	Vertical / upward velocity decreases [1]				
	· · · · · · · · · · · · · · · · · · ·				
	Acceleration remains constant / AW [1]				
' iii	no effect (by gravity) / AW [1]	1	allow doesn't (change) [1]	_	
			allow (stays) constant [1]		
	Total	7			
			-		Formatted: Font: 11 pt, Font color:
Question	Answer	Marks	Guidance		Black
10 a	A LDR / light dependent resistor [1]	3			
	B thermistor [1]				
	A responds to light OR B responds to heat or		allow ecf on the naming of the components e.g. A is a		Formatted: Font color: Black
1	temperature [1]		thermistor that responds to temperature and B is an LDR to responds to light [1]	hat	Formatted: Font: Not Bold, Font color: Black
			allow resistance of thermistor increases with temperature	OR	Formatted: Font: Not Bold, Font color: Black



Mark Scheme

Question	Answer	Marks	Guidance		Formatted: Right: -0.28 cm
111		6	This question is targeted at grades up to C.	\checkmark	Formatted: Indent: Hanging: 2.35
4	[Level 3]		Indicative scientific points may include:		Formatted: Frank: Arial 11 pt Fort
	Answer includes one difference in output Voltage				color: Black
	AND		Construction -Similarities		Formatted: Font: Arial 11 pt Font
	one similarity AND one difference in construction		 both have an iron core / same material both have the same input voltage / 20 volts/ AC both have different numbers of turns on the primary 	/ /	color: Black
	AND				Formatted: Font: Arial, 11 pt, Font
	describes a correct use for either A or B				color: Black
	Answer includes similarities and differences		compared to the secondary coils		Formatted: Font: Arial, 11 pt, For
	About construction, output voltage and uses		both isolating transformers		color: Black
	communication of the science at this level		 input voltage is connected to the primary coil / output 		Formatted: Font: Arial, 11 pt, Font
	communication of the science at this level		voltage is connected to the secondary coll		color: Black
					Formatted: Font color: Black
	Answer includes one similarity and one		Construction -Differences		Formatted: Font: Arial, 11 pt, Font
	difference in construction		<u>transformer A has less turns on the primary / transformer</u>		color: Black
	AND		transformer A has more turns on the secondary / transformer B has less turns on the secondary /		Formatted: Font: Arial, 11 pt, Font
	a correct use for either A or B OR one correct				Formattadi Fanti Arial 11 nt Fan
	comparison of output voltage		transionner Dinas less turns on the secondary	/	color: Black
	Answer includes similarities AND differences AND		Output voltage		Formatted: Font: Arial 11 pt Font
	uses		both change the output voltage	/	color: Black
	Quality of written communication partly impedes		transformer A is a step-up transformer		Formatted: Font: Arial, 11 pt, Font
	communication of the science at this level		transformer B is a step down transformer		color: Black
	(3 – 4 marks)		 the output of transformer A will be 40V or more than 20 V 		Formatted: Font: Arial, 11 pt, Font
	[Level 1] Answer includes two correct statements in terms		• the output of transformer B will be 10V or less than 20 V		color: Black
	of construction OB or output voltage or uses				Formatted: Font: Arial, 11 pt, Font
	Quality of written communication impedes		Uses	$\langle \rangle$	color: Black
	communication of the science at this level		transformer A is used in the National Grid / used in (CRT)		Formatted: Font: Arial, 11 pt, Font
	(1 - 2 marks)		TVs		
	[Level 0]		 transformer B is used in e.g. mobile phone chargers / 		color: Black
	Insufficient or irrelevant science. Answer not worthy of		radios / laptops / National Grid (to decrease voltage) / any		Formatted: Font: Arial 11 pt Font
	credit.		electronic device that is mains powered e.g. halogen lights	$\langle \rangle$	color: Black
	(0 marks)			$\langle \rangle$	Formatted: Font: Arial, 11 pt. Font
			Use the L1, L2, L3 annotations in scoris. Do not use	\setminus	color: Black
			<u>ticks</u> +nis question is targeted at grades up to C.		Formatted: Font: Arial, 11 pt, Font color: Black

B752/01	M	ark Scher	ne June 20	014	
			Indicative scientific points may include: Similarities (in order of increasing demand) • both have an iron core / same material • both have the same input voltage / 20 volts • both use AC • both have different numbers of turns on the primary compared to the secondary coils • both change the output voltage • both isolating transformers • input voltage is connected to the primary coil / output voltage is connected to the secondary coil Differences (in order of increasing demand) • transformer A has less turns on the primary / transformer B has more turns on the primary • transformer A has nore turns on the secondary / transformer A has more turns on the secondary • transformer A is a step up transformer B has more turns on the secondary • transformer B is a step down transformer Differences in output voltage • the output of transformer A will be more than 20 V / correct value • the output of transformer B will be less than 20 V / correct value Differences in uses • transformer A is used in the National Grid (to increase voltage) / used in (CRT) TVs • transformer B is used in e.g. mobile phone chargers / radios / laptops / National Grid (to decrease voltage) / any electronic device that is mains powered e.g. halogen lights		Formatted: Indent: Left: 1 cm, No bullets or numbering
			Use the L1, L2, L3 annotations in scoris.		Formatted
			Do not use ticks.		<u></u>
	Total	6			
Question	Answer	Marks	Guidance	1	

B752/01	M	ark Sche	eme	June 2014	
12 a		1	all correct for 1 mark	•	Formatted: Right: -0.28 cm
	Input Output				
	0 1				
	1 (0)				
	[1]				
bi	A and B [1]	1	more than one scores 0 marks		
			if answer line blank allow correct answer indicated in list		
ii	E[1]	1	more than one scores 0 marks		
			if answer line blank allow correct answer indicated in list		
iii	row X [1]	1	more than one scores 0 marks		
			if answer line blank allow correct answer indicated in list		
	Total	4			

B752/01	Mark Scheme			June 2014	
Question	Answer	Marks	Guidance		
13 a	are all straight lines / AW [1]	1	allow are not curved or increase at steady rate [1]	•	Formatted: Right: -0.28 cm
b i	(The voltage at X) is 2.4 (volts)	1	both required for 1 mark		
	and				
	(The current at X is) 0.32 (amps) [1]				
ii	7.5 ohms [1]	1	more than one scores 0 marks		
			if answer line blank allow correct answer indicated in list		
С	E [1]	1	more than one scores 0 marks		
			if answer line blank allow correct answer indicated in list		
d	(charge carriers are) not neutrons they are electrons [1]	2	allow mistakes indicated on the text		
	(resistance does not stay the same) it changes / increases [1]		not resistance decreases		
	Total	6			

B752/01	Mark Scheme				
Question	Answer	Marks	Guidance		
14 a	any two appliances in the home with motors correctly described [2]	2	examples of appliances in the home with motors include CD player to turn CDs food processor to mix food electric drill to make a hole/ turn the drill (bit) electric screwdriver to turn the screw fan to turn the blades <u>blender or food processor to chop and blend food</u> microwave to spin the cooking plate dishwasher to move the water round fridge motor to move air/coolant around fan ovens to cook the food (faster) allow-lawnmower to turn blades / cut grass		Formatted: Right: -0.28 cm
b	Factor (no mark) any two from (idea that) efficiency decreases with increasing current [1] best efficiency at 4 amps is 94% [1]or best efficiency at 4 amps is 94% [1] <u>best efficiency at 6 amps is 87% [1]</u> <u>best efficiency at 6 amps is 87% [1]</u> (idea that) motor needs to have the best efficiency in range between 4 amps and 6 amps [14]	2	ignore choice of motor <u>if no marks awarded</u> allow the idea that Factor has the high average efficiency [1]	nest	Formatted: Font color: Black Formatted: Font color: Black
	Total	4			

B752/01	Γ	lark Sche	me June 20	014	
Question	Answer	Marks	Guidance		Formatted: Font color: Black
15 a	Maximum 2 marks	2	Mark letters on the line first	•	Formatted: Right: -0.28 cm
			If nothing on the line accept circled or ticked or underlined letters		Formatted: Font color: Black
	 B (Front row music festival) C (Large orchestra) D (Aircraft at take-off) H (MP3 player at maximum volume) 		All 4 correct (with none wrong) [2] BUT 3 or 4 correct with one wrong [1] No mark awarded if 2 incorrect		
b i	Loudness reduces with (increasing) distance [1]	2	allow higher level answers		Formatted: Font color: Black
	BUT		allow it changes very little after 22 to 24 metres [1]		Formatted: Font: Bold. Font color:
	distance) at first and slower later [2]			\sim	Black
ii	82 to 83 (dB) [1]	1			Formatted: Font color: Black
					Formatted: Font color: Black
 iii	any two from	2			Formatted: Font color: Black
	Maximum 2 marks		allow (idea that) gardener is very close (so it is much louder) [1]		Formatted: Font color: Black
	Gardener above safe level / 90dB AW [1]		allow (idea that) sound is stopped by walls or windows [1]		Formatted: Font color: Black
	People in house under safe level /90dB AW [1]				
	(idea that) gardener is exposed to the noise for more time [1]				
<u>c</u> i	4 (hours) [1]	1	allow Consider tolerance at SSU eg 3 - 6 (hours)?		Formatted: Font color: Black
ii	Less than (4 minutes) [1]	1	NOT_less than or equal to 4 minutes		Formatted: Font color: Black
			allow up to 4 minutes [1]		Formatted: Font color: Black
<u> </u>	Any value from 78 to 79 (dB) [1]	1	Consider tolerance at SSU		Formatted: Font color: Black
	Total	10			

Mark Scheme

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