

Additional Applied Science A

General Certificate of Secondary Education

Unit **A336/01**: Materials and Performance (Foundation Tier)

Mark Scheme for June 2011

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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.

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

/	=	alternative and acceptable answers for the same marking point
(1)	=	separates marking points
not	=	answers which are not worthy of credit
reject	=	answers which are not worthy of credit
ignore	=	statements which are irrelevant
allow	=	answers that can be accepted
()	=	words which are not essential to gain credit
—	=	underlined words must be present in answer to score a mark
ecf	=	error carried forward
AW	=	alternative wording
ora	=	or reverse argument

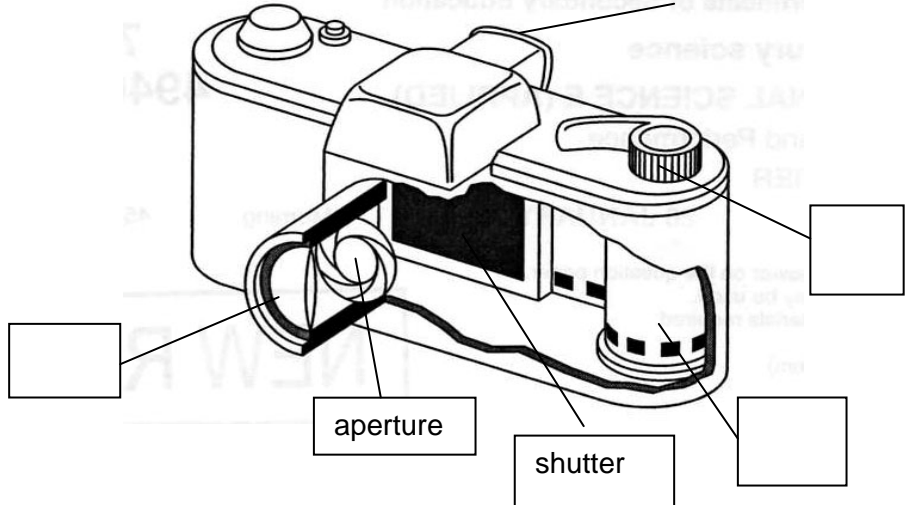
Question		Expected Answers		Marks	Additional Guidance													
1	a	hard; stiff		2														
1	b	<table border="1"> <tr> <td></td> <td>high thermal conductance</td> </tr> <tr> <td>A pan which lets heat pass through quickly.</td> <td></td> </tr> <tr> <td></td> <td>low thermal conductance</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td>high electrical conductance</td> </tr> <tr> <td>A glove for picking up hot pans.</td> <td></td> </tr> <tr> <td></td> <td>low electrical conductance</td> </tr> </table>		high thermal conductance	A pan which lets heat pass through quickly.			low thermal conductance				high electrical conductance	A glove for picking up hot pans.			low electrical conductance	2	zero for that box if two lines from a left hand side box
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		Total	[6]															

Question		Expected Answers			Marks	Additional Guidance
2	a	part of lamp	electrical property	mechanical property	3	all 4 correct 3 marks 3 correct 2 marks 1 or 2 correct 1 mark
		outer layer of cable	insulator	flexible		
		pins of plug	conductor	rigid		
	b	any valid example of using a mirror, with either the context or the purpose			1	eg to see round corners; security in a shop; for brighter light; makes room look bigger; to look at yourself; see a reflection; wing mirror, two way mirror; in SLR cameras, hairdressers, lines of symmetry reject information which is not about use, eg shiny, reflective, 'mirrors can be curved'; not just 'shop' because it is in stem; reject 'reflect light' on its own – must be clarified
	c	safety/ so it doesn't break (owtte); privacy/ so you can't see through(owtte); can't be reached(owtte); allows colours(owtte)			4	allow security allow anything implying difficulty to clean; so windows stay clean allow decorative use/looks nice
	d	B			1	
		Total			[9]	

Question		Expected Answers	Mark	Additional Guidance	
3	a	link between a particular job and knowledge of material properties	1	eg builder needs to know mechanical properties of building materials/ must use materials that are strong enough accept specific consequence of wrong properties eg builder so buildings don't collapse accept hairdresser must know how chemicals will react/ use chemicals that won't harm customers reject if no specific information given eg 'so it's ok/ so it works/ so he doesn't get sued', because it is best to use	
	b	i	any valid example of product with nature of safety margin; reason why safety margin is needed	2	example must be comparative with normal use examples child's swing designed for one child but will take extra weight (1) because two children might swing on it at once(1) rotating machinery designed for 'max' no of revs but will be safe at higher revs (1) machinery might spin too rapidly and could cause serious damage if parts snapped at high speed (1) bridges are designed to carry more weight than expected (1) because many heavy lorries at one time could cause collapse (1) accept reference to coping with extreme conditions eg bridge surviving an earthquake = 1 reject responses that lack additional information eg 'to keep it safe' 'so people don't get hurt' reject anything to do with a roof – already in stem

Question		Expected Answers	Mark	Additional Guidance	
	b	ii	any valid example of a job which involves enforcing standards	1	<p>expect examples of enforcing legal standards. examples: trading standards inspector, meat inspector , health/safety officer; food inspector reject responses which do not include a job eg 'health and safety' reject responses which do not include an impartial agency eg supervisor, Tesco, McDonald's, manufacturer reject 'agencies' eg food standards agency reject building inspector – in stem of Q or house inspector</p>

Question		Expected Answers	Mark	Additional Guidance												
	b	iii														
		<table border="1"> <tr> <td>reason</td> <td></td> </tr> <tr> <td>so products are safe</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>so products cost less</td> <td><input type="checkbox"/></td> </tr> <tr> <td>so products look smart</td> <td><input type="checkbox"/></td> </tr> <tr> <td>so products are in fashion</td> <td><input type="checkbox"/></td> </tr> <tr> <td>so products are fit for purpose</td> <td><input checked="" type="checkbox"/></td> </tr> </table>	reason		so products are safe	<input checked="" type="checkbox"/>	so products cost less	<input type="checkbox"/>	so products look smart	<input type="checkbox"/>	so products are in fashion	<input type="checkbox"/>	so products are fit for purpose	<input checked="" type="checkbox"/>	2	more than two ticks then minus one for each extra tick
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	c	BS; ISO	2	more than two responses then minus one for each extra												
		Total	[8]													

Question			Expected Answers	Marks	Additional Guidance
4	a	i	 <p>The diagram shows a camera with a lens on the left and a viewfinder on the right. A label 'aperture' points to the lens. A label 'shutter' points to the top of the camera body. There are three empty boxes: one on the left pointing to the lens, one on the right pointing to the viewfinder, and one at the bottom right pointing to the film advance lever.</p>	2	subtract 1 mark for each multiple answer eg two boxes containing the word 'shutter'
	a	ii	so more light passes through / to reduce reflection	1	allow bright(er)/clear(er) image allow 'reduce glare'
	b	i	refraction	1	
	b	ii	diopetre(s)	1	allow D but reject 'd'

Question		Expected Answers	Marks	Additional Guidance
	c	focal length-the distance from the (centre of the) <u>lens</u> to the image	1	allow distance from lens to where you put the film/CCD. allow distance from lens to focal point/plane allow distance from lens to where the rays cross. allow distance to be shown on the diagram BUT must be parallel to axis If diagram contradicts the explanation then zero
		focal plane – the plane/ vertical line where the image is made / vertical line drawn through image and labelled	1	allow idea of position to get the best image eg where the image is sharp/where the rays meet, allow where the film/CCD is, reject responses which are ambiguous and may not refer to image position eg 'where you focus it' If diagram contradicts the explanation then zero
Total			7	

Question			Expected Answers	Marks	Additional Guidance
5	a	i	3;	1	
	a	ii	if YES idea of test being repeated; results/graphs are similar if NO not enough repeats/need more repeats; results/graphs are different	2	no marks for just yes or no ignore incorrect number of repeats 'both' implies repeats eg both results/graphs are similar = 2 allow should be done three times
	b		method of applying force; method of measuring deflection; change force/change sample	3	zero for impact tests eg hitting, dropping etc accept using a ruler to measure deflection zero for 'test them all' unless the test is described
			Total	[6]	
			Total	[36]	

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