

Additional Applied Science A

General Certificate of Secondary Education

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

Mark Scheme for January 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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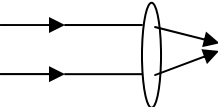
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- 1 Abbreviations, annotations and conventions used in the detailed mark scheme:
- / = alternative and acceptable answers for the same marking point
 - (1) = separates marking points
 - not/reject** = answers which are not worthy of credit
 - ignore** = statements which are irrelevant - applies to neutral answers
 - allow/accept** = answers that can be accepted
 - (words) = words which are not essential to gain credit
 - words = underlined words must be present in answer to score a mark
 - ecf = error carried forward
 - AW/owtte = alternative wording
 - ORA = or reverse argument

Question		Expected Answers	Marks	Additional Guidance
1	(a)		[4]	correct pattern = 4 marks one mistake = 3 marks two mistakes = 2 marks three mistakes = 1 marks mark left hand boxes – if two lines from same box = 0 marks

Question		Expected Answers	Marks	Additional Guidance
	(b)	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>material</p> <p>brick</p> <p>pine</p> <p>paper</p> <p>stainless steel</p> </div> <div style="width: 45%;"> <p>material class</p> <p>alloy</p> <p>ceramic</p> <p>pure metal</p> <p>wood</p> <p>wood product</p> </div> </div>	[4]	correct pattern = 4 marks one mistake = 3 marks two mistakes = 2 marks three mistakes = 1 marks
		Total	[8]	

Question		Expected Answers	Marks	Additional Guidance
2	(a)	<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">modern frame</div> <div style="border: 1px solid black; padding: 5px; margin-left: 10px;">heat and draw into wires;</div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">medieval frame</div> <div style="border: 1px solid black; padding: 5px; margin-left: 10px;">heat and beat into sheets;</div> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; width: 100%;">melt and pour into a mould</div> <div style="border: 1px solid black; padding: 5px; width: 100%;">carve from a large block</div> </div>	[2]	one mark each correct line mark left hand side if two lines from one box no mark for that box
	(b)	to fit the face/ to adjust/ so they fold up;	[1]	allow 'for different people to use', 'to fit in your pocket'
	(c)	toughness;	[1]	
	(d) (i)		[1]	both rays must show convergence accept rays pointing towards each other (do not need to meet, no need for arrows, do not need to be continuous)
	(ii)	lens B;	[1]	
	(iii)	refraction;	[1]	
Total			[7]	

Question		Expected Answers	Marks	Additional Guidance
3	(a)	dense <input type="checkbox"/> flexible <input type="checkbox"/> hard <input checked="" type="checkbox"/> insulator <input type="checkbox"/> tough <input checked="" type="checkbox"/>	[2]	minus 1 mark for each additional box ticked
	(b) (i)	air vents to keep him cool <input type="checkbox"/> not very dense to make it light <input type="checkbox"/> fits Danny's head for comfort <input type="checkbox"/> increases the time for a collision <input checked="" type="checkbox"/>	[1]	minus 1 mark for each additional box ticked
	(ii)	compression;	[1]	
	(c) (i)	B;	[1]	
	(ii)	velocity;	[1]	
Total			[6]	

Question			Expected Answers	Marks	Additional Guidance
4	(a)	(i)	The notes are too close together. <input type="checkbox"/> His ear is more sensitive for one frequency. <input checked="" type="checkbox"/> One note is ultrasound. <input type="checkbox"/> One note lasts for a longer time. <input type="checkbox"/>	[1]	
		(ii)	2,000 Hz;	[1]	
	(b)		pitch; intensity;	[2]	
			Total	[4]	

Question		Expected Answers	Marks	Additional Guidance
5	(a)	<p>clear indication of: method of applying pure tension;</p> <p>how known force is applied;</p> <p>measure force which causes sample to snap;</p>	[3]	<p>cantilevers, beams or compression tests can only score on the last two marks</p> <p>allow adding known weights</p> <p>allow add weights until it breaks but only allow this mark if it is a sensible method eg no mark for dropping weights onto sample until it breaks</p> <p>reject measurements of length, time, pressure</p>
	(b)	strong in tension;	[1]	<p>needs both for the mark</p> <p>not stiff</p>
	(c)	(i)	[2]	<p>eg (reinforced) concrete (1) for paths/bridges etc (1)</p> <p>woodchip in resin (1) for kitchen units (1)</p> <p>allow bone/wood</p> <p>reject fibre glass/alloys/cement</p> <p>must name a valid composite to achieve mark for use</p>
		(ii)	[1]	<p>diagram clearly showing one material embedded in another;</p> <p>must be material in c(i) and diagram must be labelled</p>
Total			[7]	

Question		Expected Answers	Marks	Additional Guidance
6	(a)	upright; virtual;	[2]	allow right way up reject not inverted and not real/fake/imaginary size is neutral
	(b)	valid example of specialised glass and use; valid reason;	[2]	eg toughened glass in windows (1); so people don't fall through/not cut by broken glass (1) photochromic glass in spectacles/glasses (1); to protect the eyes/adjust light intensity (1) reject reference to lamps
Total			[4]	
Paper Total			[36]	

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