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**DESIGN AND TECHNOLOGY**

**9705/12**

Paper 1

**October/November 2016**

MARK SCHEME

Maximum Mark: 120

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**Published**

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Page 2	Mark Scheme	Syllabus	Paper
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### Section A

<b>1</b>	<b>(a)</b>	Outer shape of nut (square or hexagonal)	0–1	
		Threaded hole	0–1	<b>[2]</b>
	<b>(b)</b>	<b>(i)</b> Appropriate bending process described	0–3	
		Details of appropriate tools, equipment and safety precautions	0–3	<b>[6]</b>
		<b>(ii)</b> Appropriate method for making thread described	0–3	
		Details of appropriate tools, equipment and safety precautions	0–3	<b>[6]</b>
		<b>(iii)</b> Appropriate method of brazing described	0–3	
		Details of appropriate tools, equipment and safety precautions	0–3	<b>[6]</b>
				<b>[Total: 20]</b>
<b>2</b>	<b>(a)</b>	<b>(i)</b> Correct height of model of desk 75 mm		<b>[1]</b>
		<b>(ii)</b> Correct length of model of desk 280 mm		<b>[1]</b>
	<b>(b)</b>	Pictorial view produced	0–2	
		Six parts shown in correct positions	0–2	
		Quality of sketch	0–2	<b>[6]</b>
	<b>(c)</b>	<b>(i)</b> Correct shape marked out	0–2	
		Cutting out and assembly described	0–2	
		Details of appropriate tools, equipment and safety precautions	0–2	<b>[6]</b>
		<b>(ii)</b> Correct shape marked out	0–2	
		Cutting out and assembly described	0–2	
		Details of appropriate tools, equipment and safety precautions	0–2	<b>[6]</b>
				<b>[Total: 20]</b>
<b>3</b>	<b>(a)</b>	Each appropriate safety issue given 1 mark	0–2	<b>[2]</b>
		For example, no small parts, no sharp corners or edges		
	<b>(b)</b>	<b>(i)</b> Appropriate method of making part <b>A</b> described	0–3	
		Details of appropriate tools, equipment and safety precautions	0–3	<b>[6]</b>
		<b>(ii)</b> Appropriate method of making parts <b>B and C</b> described	0–3	
		Details of appropriate tools, equipment and safety precautions	0–3	<b>[6]</b>
		<b>(iii)</b> Appropriate changes suggested	0–3	
		How changes could be made clearly communicated	0–3	<b>[6]</b>
				<b>[Total: 20]</b>

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### Section B

- 4 (a)** Correct explanation of the use of parting powder 0–2 **[2]**
- For example, Parting powder is used to coat any surfaces that will later need to be separated, it helps to stop the surfaces sticking together.
- (b)** Problem one identified and described 0–2
- Problem two identified and described 0–2 **[4]**
- For example, there is nowhere for the air to escape when the molten metal is poured in the mould  
There is nowhere for the excess metal to go when the mould is full  
Gases that are created during the process have no way of escaping from the mould
- (c)** Explanation of how problem one could be overcome 0–3
- Explanation of how problem two could be overcome 0–3 **[6]**
- For example, adding a tapered sprue pin as a riser which excess metal can go into when mould is full  
Adding small vent holes in the sand for air and gases to escape through
- (d) (i)** Situation has been analysed and relevant issues/points identified 0–3 **[3]**
- (ii)** Clear and appropriate explanations of why issues/points are considered relevant 0–3 **[3]**
- (iii)** Specific examples/evidence used to support conclusions 0–2 **[2]**
- [Total: 20]**

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- 5 (a) Appropriate explanation given related to the fact that it makes it easier to close the box because the rounded flaps tuck in better than if the corners were right angles. 0–2 [2]
- (b) Problem one identified and described 0–2  
 Problem two identified and described 0–2 [4]  
 For example, the vase will not go in the box because the opening is too small  
 The development will not produce the required shape because the sides of the box and the fold in flaps are the wrong shape
- (c) Explanation of how problem one could be overcome 0–3  
 Explanation of how problem two could be overcome 0–3 [6]  
 For example, the opening part of the box is changed to either the front or the side  
 The shape of the sides and fold in flaps are changed to Rectangles rather than parallelograms
- (d) (i) Situation has been analysed and relevant issues/points identified 0–3 [3]
- (ii) Clear and appropriate explanations of why issues/points are considered relevant 0–3 [3]
- (iii) Specific examples/evidence used to support conclusions 0–2 [2]
- [Total: 20]**
- 6 (a) (i) Correct answer hinge 1
- (ii) Correct answer lock or catch 1 [2]
- (b) Problem one identified and described 0–2  
 Problem two identified and described 0–2 [4]  
 For example, metal stay fixed to side of front will prevent front closing because there is no space to accommodate the thickness of the metal  
 Present design of metal stay prevents the front closing because it is fixed at both ends
- (c) Explanation of how problem one could be overcome 0–3  
 Explanation of how problem two could be overcome 0–3 [6]  
 For example, fixing method is required which allows the metal stay to pivot and be attached to inside of front rather than on its edge  
 There needs to be a slot along the length of the metal stay so that it can slide into the cabinet as the front is closed
- (d) (i) Situation has been analysed and relevant issues/points identified 0–3 [3]
- (ii) Clear and appropriate explanations of why issues/points are considered relevant 0–3 [3]
- (iii) Specific examples/evidence used to support conclusions 0–2 [2]
- [Total: 20]**

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### Section C

<b>7</b>	<p><b>(a)</b> One pre-conceived Idea presented <span style="float: right;">0–4</span></p> <p><b>OR</b></p> <p>The development and selection of a range of ideas into a single design proposal which would appear to work but lacks some technical detail <span style="float: right;">5–8</span></p> <p><b>OR</b></p> <p>The development and selection of a range of Ideas into a single design proposal that Includes sufficient technical detail to show that the proposed solution would clearly work <span style="float: right;">9–12</span></p> <p>Clarity and quality of sketching and explanatory notes <span style="float: right;">0–4</span></p> <p>Evaluation (reasons for selection) <span style="float: right;">0–4 [20]</span></p>
	<p><b>(b)</b> As for <b>part (a)</b> <span style="float: right;">[20]</span></p>
	<p><b>(c)</b> As for <b>part (a)</b> <span style="float: right;">[20]</span></p>
	<p><b>(d)</b> The drawing will exhibit a reasonable standard of outcome and show some of the required design features <span style="float: right;">0–5</span></p> <p><b>OR</b></p> <p>The drawing will exhibit a good standard of outcome and show most of the design features required to make the product function as intended <span style="float: right;">6–9</span></p> <p><b>OR</b></p> <p>The drawing will be completed to a high standard of outcome and fully show the design features required to make the product function as intended <span style="float: right;">10–14</span></p> <p>Some use made of colour and tone to enhance the visual Impact of the drawing <span style="float: right;">0–2</span></p> <p><b>OR</b></p> <p>Good use has been made of colour and tone to enhance the visual impact of the drawing <span style="float: right;">3–4</span></p> <p><b>OR</b></p> <p>Very good use has been made of colour, tone and material representation to enhance the visual impact of the drawing <span style="float: right;">5–6 [20]</span></p>
	<b>[Total: 80]</b>

**Questions 8 and 9 as for Question 7**