



Cambridge International AS & A Level

DESIGN AND TECHNOLOGY

9705/12

Paper 1

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MARK SCHEME

Maximum Mark: 120

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.

Cambridge International will not enter into discussions about these mark schemes.

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This document consists of **12** printed pages.

PUBLISHED**Generic Marking Principles**

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

PUBLISHED**Section A**

Question	Answer	Marks	Guidance
1(a)	Stability, less likely to warp, tolerance on thickness, no grain, cost, Easier to work with, takes a finish easily	2 0–2	Accept other correct procedures
1(b)(i)	Appropriate cutting and smoothing process described	3 0–3	Hand techniques or CAM both acceptable Measured, marked, cut out external and internal shape
	Details of appropriate tools, equipment and safety precautions	3 0–3	Tape measure, pencil, band saw/jig saw, sander- Eye protection, hair tied back, fingers clear, work clamped, dust mask Limited tools/equipment 1 mark Good tools/equipment 2 marks Good tools/equipment and safety precautions 3 marks
1(b)(ii)	Appropriate knock-down/temporary fittings described	3 0–3	Corner Blocks, Dowels, Modesty Blocks
	Details of appropriate tools, equipment and safety precautions	3 0–3	Tape measure, pencil, drill - Eye protection, hair tied back, fingers clear, work clamped Limited tools/equipment 1 mark Good tools/equipment 2 marks Good tools/equipment and safety precautions 3 marks

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Question	Answer	Marks	Guidance
1(b)(iii)	Appropriate decorative finish described	0–3	3 Sealers, paint, veneer
	Details of appropriate tools, equipment and safety precautions	0–3	3 Paint brush, clear of dust debris, veneering described, cloth for waxing/polishing. Well ventilated area, gloves Limited tools/equipment 1 mark Good tools/equipment 2 marks Good tools/equipment and safety precautions 3 marks

Question	Answer	Marks	Guidance
2(a)(i)	Economic, quick, easy to use, realistic impression, easy to modify, cheap. 0–2	2	Accept other correct reasons
2(b)	Pictorial (3D) view produced	0–3	3 3D Sketch 1 mark Proportion 1 mark Handle and guard clearly detailed 1 mark
	Quality of sketch	0–3	3 Poor line quality or limited detail 1 mark Good line work and detail 2 marks Accurate line work and fully detailed 3 marks

Question	Answer	Marks	Guidance	
2(c)(i)	Correct shape marked out and cut out	0–3	3	Measure, mark, cut out, scored. Accept CAM
	Details of appropriate tools, equipment and safety precautions	0–3	3	Ruler, compass, pencil, craft knife, scoring tool Safety mat, safety ruler, fingers back care with sharp blades Limited tools/equipment 1 mark Good tools/equipment 2 marks Good tools/equipment and safety precautions 3 marks
2(c)(ii)	Clear explanation of strengthening	0–3	3	Thicker card, ribs, webs, lattice all possible, alterations to net shape
	Details of appropriate tools, equipment and safety precautions	0–3	3	Ruler, pencil, craft knife, glue Eye protection, hair tied back, fingers clear Limited tools/equipment 1 mark Good tools/equipment 2 marks Good tools/equipment and safety precautions 3 marks

Question	Answer	Marks	Guidance	
3(a)(i)	Stable material, no warping or grain structure Hardwearing, durable Aesthetic reasons, self-colouring, no finish required Not easy to shape and cut by traditional methods Appropriate for CAM is necessary	0–2	2	Each appropriate reason given 1 mark Accept other correct reasons

Question	Answer	Marks	Guidance	
3(b)(i)	Appropriate method of cutting and shaping described	0–3	3	Hand techniques or CAM both acceptable Measured, marked, cut out,
	Details of appropriate tools, equipment and safety precautions	0–3	3	Tape measure, pencil, band saw/jig saw, sander, laser cutter - Eye protection, hair tied back, fingers clear, work clamped Limited tools/equipment 1 mark Good tools/equipment 2 marks Good tools/equipment and safety precautions 3 marks
3(b)(ii)	Appropriate method of cutting and shaping described	0–3	3	Hand techniques or CAM both acceptable Measured, marked, cut out, holes drilled and coping saw or laser
	Details of appropriate tools, equipment and safety precautions	0–3	3	Tape measure, pencil, drill, coping/jig saw, laser cutter - Eye protection, hair tied back, fingers clear, work clamped Limited tools/equipment 1 mark Good tools/equipment 2 marks Good tools/equipment and safety precautions 3 marks
3(c)	Appropriate changes suggested	0–3	3	Shape, colour, style, branding
	How changes could be made clearly communicated	0–3	3	Limited detail 1 mark Good detail 2 marks Fully detailed 3 marks

PUBLISHED**Section B**

Question	Answer	Marks	Guidance	
4(a)	Function of part X explained	0–2	2	Steps Answer must be justified Safe access without slipping To allow a child to climb to the top of the slide
4(b)	Two problems identified and described	0–2	2	No sides on slide
		0–2	2	No safety handles Large drop off slide Sharp edges Accept other 'realistic' changes
4(c)	Explanation of how problem one could be overcome	0–3	3	Adding sides to slide accept other correct change
	Explanation of how problem two could be overcome	0–3	3	Adding safety handles – either at top or on steps Rounding edges Accept other changes
4(d)(i)	Situation has been analysed and relevant issues/points identified	0–3	3	Strength and stress tests to avoid breakage in use
4(d)(ii)	Clear and appropriate explanations of why issues/points are considered relevant	0–3	3	X-rays to avoid hair line cracks
4(d)(iii)	Specific examples/evidence used to support conclusions	0–2	2	Customer reassurance Allows benchmarks from different companies; e.g. BSI. Must relate to the manufacture

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Question	Answer	Marks	Guidance	
5(a)	Function of part X explained	0–2	2	Tab to aid opening and then closing when being used – lockable Answer must be justified
5(b)	Problem one identified and described	0–2	2	There is no slot for the opening tab to slot into
	Problem two identified and described	0–2	2	Sides are all one piece and will not allow the box to fold – addition of glue tabs
5(c)	Explanation of how problem one could be overcome	0–3	3	Slot added
	Explanation of how problem two could be overcome	0–3	3	Sides and glue tabs added
5(d)(i)	Situation has been analysed and relevant issues/points identified	0–3	3	Visual impact, style, contrast, attract customer
5(d)(ii)	Clear and appropriate explanations of why issues/points are considered relevant	0–3	3	
5(d)(iii)	Specific examples/evidence used to support conclusions	0–2	2	

Question	Answer	Marks	Guidance	
6(a)	Function of part X explained	0–2	2	Answer must be justified Air inlet allows air to be drawn in and subsequently heated Prevent the ingress of foreign matter e.g. Hair Protects user from the heating elements Protects the electrical components

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Question	Answer	Marks	Guidance	
6(b)	Problem one identified and described	0–2	2	No on/off switch Uncomfortable handle
	Problem two identified and described	0–2	2	No diagrams/instructions on product No means of connecting to the mains Takes longer to dry hair
6(c)	Explanation of how problem one could be overcome	0–3	3	Add switches/coloured Shape of handle improved
	Explanation of how problem two could be overcome	0–3	3	Instructions on product – hot? Add mains electric plug
6(d)(i)	Situation has been analysed and relevant issues/points identified	0–3	3	Reduce use of finite resources
6(d)(ii)	Clear and appropriate explanations of why issues/points are considered relevant	0–3	3	Carbon footprint Cleaner energy
6(d)(iii)	Specific examples/evidence used to support conclusions	0–2	2	Renewable energy

PUBLISHED**Section C**

Question	Answer	Marks	Guidance
7(a)	One pre-conceived idea presented 0–4	20	
	OR The development and selection of a range of ideas into a single design proposal which would appear to work but lacks some technical detail 5–8		
	OR The development and selection of a range of ideas into a single design proposal which would appear to technical detail to show that the proposed solution would clearly work 9–12		
	Clarity and quality of sketching and explanatory notes 0–4		
	Evaluation (reasons for selection) 0–4		
7(b)	As for part (a)	20	
7(c)	As for part (a)	20	
7(d)	The drawing will exhibit a reasonable standard of outcome and show some of the required design features 0–5	20	
	OR The drawing will exhibit a good standard of outcome and show most of the design features required to make the product function as intended 6–9		
	OR 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 10–14		
	Some use made of colour and tone to enhance the visual impact of the drawing 0–2		
	OR Good use has been made of colour and tone to enhance the visual impact of the drawing 3–4		
	OR Very good use has been made of colour, tone and material representation to enhance the visual impact of the drawing 5–6		

Question	Answer	Marks	Guidance
8	as for Question 7	20	

Question	Answer	Marks	Guidance
9	as for Question 7	20	