Cambridge Assessment International Education

Cambridge International AS & A Level

DESIGN & TECHNOLOGY **9705/11**

Paper 1 **October/November 2023**

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.

Cambridge International is publishing the mark schemes for the October/November 2023 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

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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**:

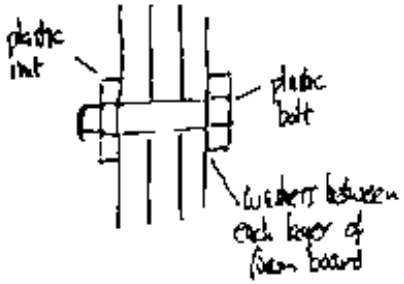
- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can 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.

Question	Answer	Marks	Guidance
Section A			
1(a)	Exemplar answers: Hygienic finish/easily cleaned [1] Will not rust [1] **0–2**	**2**	AOVR include: • attractive finish • will not react with the salt • hardwearing and long lasting
1(b)(i)	Sketches and/or notes show: Method of making the top of the salt pot Suitable method [0–3] e.g. mark out, cut out and fold with hand tools. Tools, equipment or processes Suitable method [0–2] snips, coping saw, file, folding bars Safety precaution [0–1] **0–6**	**6**	Accept CNC methods.
1(b)(ii)	Method of making the body of the salt pot Suitable method [0–3] e.g. drilling the centre out on a lathe. Tools, equipment or processes Suitable method [0–2] 4 jaw chuck Safety precaution [0–1] **0–6**	**6**	Accept CNC methods.
1(c)	Sketches and/or notes show: Method of making 5000 of the stopper Suitable method [0–3] e.g. injection moulding. Tools, equipment or processes [0–3] **0–6**	**6**	Accept 3D Printing

Question	Answer	Marks	Guidance
2(a)	 Sketch shows: Method of securing the foamboard discs [1] that allows them to rotate [1] **0–2**	**2**	Examples of fasteners include: • nut and bolt plastic push fitting
2(b)(i)	Sketches and/or notes show: Marking out and cutting to shape Suitable method [0–3] e.g. pencil, set square... Tools, equipment or processes Suitable method [0–2] e.g. craft knife, circle cutter... Safety precaution [0–1] **0–6**	**6**	Accept hand or CNC methods.
2(b)(ii)	Sketches and notes show: Method Suitable method [0–3] e.g. vinyl cutter... Tools, equipment or processes [0–2] Safety precaution [0–1] **0–6**	**6**	Accept hand or CNC methods.

Question	Answer	Marks	Guidance
2(b)(iii)	Sketches and/or notes show: Marking out, cut and folding to shape Suitable method [0–3] e.g. felt tipped pen, bandsaw ... Tools, equipment or processes Suitable method [0–2] e.g. line bender. Safety precaution [0–1] **0–6**	**6**	Accept hand or CNC methods.

Question	Answer	Marks	Guidance
3(a)	Exemplar answer: To fasten it down to a bench/surface [1] so it won't move when clamping material [1] **0–2**	**2**	
3(b)(i)	Sketches and/or notes show: Method Suitable method [0–3] e.g. plastic dip coating. Tools, equipment or processes Suitable method [0–2] Safety precaution [0–1] **0–6**	**6**	Also accept injection moulded sleeve, shrink wrap...
3(b)(ii)	Sketches and/or notes show: Marking out holes, drilling and holding Suitable method of marking and drilling holes [0–3] e.g. measurement, marking out, centre punching and then use of drill Tools, equipment or processes [0–2] engineer's square, rule, scriber, centre punch ... Safety precaution [0–1] **0–6**	**6**	

Question	Answer	Marks	Guidance
3(c)	Notes and sketches show: Adjustable – horizontal sliding mechanism [0–2] Adjustable – vertical threaded mechanism [0–2] Prevent damage to the work - rubber cap [0–2] **0–6**	**6**	

Question	Answer	Marks	Guidance
Section B			
4(a)	Feature X is bracing [1] to strengthen the legs [1] **0–2**	**2**	
4(b)	Problem one identified [1] and described [1] Problem two identified [1] and described [1] e.g. Legs [1] will collapse [1] **0–4**	**4**	Other acceptable answers include: 1 Legs too long to fold under. 2 Tabletop hinge in wrong position. 3 No means of holding shut.
4(c)	Explanation of how problem one could be overcome [0–3] Explanation of how problem two could be overcome [0–3] e.g. add a means of securing [1] the legs [1] in a vertical position [1] **0–6**	**6**	
4(d)(i)	Situation has been analysed and relevant issues/points identified e.g. do not have the equipment/expertise to make [1] do not need to hold stock [1], greater flexibility [1] **0–3**	**3**	
4(d)(ii)	Clear and appropriate explanations of why issues/points are considered relevant e.g. can specialise in core manufacturing processes rather than trying to make all parts [1], stock is expensive to store and items can be purchased and delivered in hours [1], different size/specification standardised components can be purchased as required at competitive prices [1] **0–3**	**3**	

Question	Answer	Marks	Guidance
4(d)(iii)	Specific examples/evidence used to support conclusions e.g. just in time (JIT) widely used in manufacturing [1], finishes for furniture are usually bought in rather than made by the furniture manufacturer [1] **0–2**	**2**	

Question	Answer	Marks	Guidance
5(a)	Feature X is a label [1] that gives details of the flooring type, cost, finish ... [1] **0–2**	**2**	
5(b)	Problem one identified [1] and described [1] Problem two identified [1] and described [1] e.g. development (net) has only cut lines [1] so will fall apart [1] **0–4**	**4**	Other acceptable answers include: 1 Middle wooden samples won't fit in. 2 Closure incomplete. 3. No edges, just bottom and top
5(c)	Explanation of how problem one could be overcome [0–3] Explanation of how problem two could be overcome [0–3] e.g. change some cut lines to fold lines [1] shown by dashed lines [1] so that it is a one-piece development (net) [1] **0–6**	**6**	
5(d)(i)	Situation has been analysed and relevant issues/points identified e.g. quicker to create and edit drawings on CAD [1], can see different 3D and 2D views [1], can easily and quickly share with customers [1] **0–3**	**3**	

Question	Answer	Marks	Guidance
5(d)(ii)	Clear and appropriate explanations of why issues/points are considered relevant e.g. initial drawing and changes need to made quickly to satisfy customer demand [1], the different views allow for better communication with clients [1], transfer of electronic drawings by email or secure transfer method, tessellations reduce waste [1] **0–3**	**3**	
5(d)(iii)	Specific examples/evidence used to support conclusions e.g. draughtsman largely replaced by CAD designers [1], CAD drawings transferred directly to computer controlled machines [1] **0–2**	**2**	

Question	Answer	Marks	Guidance
6(a)	Feature X allows spilt water [1] to drain into a tray and not become a danger or need wiping up [1] **0–2**	**2**	Also accept prevent cups sliding or fabric to absorb water.
6(b)	Problem one identified [1] and described [1] Problem two identified [1] and described [1] e.g. no means of connecting [1] the kettle to the power supply [1] **0–4**	**4**	Other acceptable problems include: 1 No means of checking water level. 2 Handle prevents the lid being removed to add water. 3 No on/off switch
6(c)	Explanation of how problem one could be overcome [0–3] Explanation of how problem two could be overcome [0–3] e.g. add a connection underneath the kettle [1] and on the indentation in the tray [1] so that when the kettle is in position it is connected to the power [1] **0–6**	**6**	

Question	Answer	Marks	Guidance
6(d)(i)	Situation has been analysed and relevant issues/points identified e.g. products need to be designed so people can use them safely [1], if they are not ergonomically designed they will be uncomfortable to use [1] if the layout of the tray is not ergonomically designed it will be difficult to use [1] **0–3**	**3**	
6(d)(ii)	Clear and appropriate explanations of why issues/points are considered relevant e.g. if the mug cannot be safely lifted by the handle, hot liquid could be spilt [1], a teaspoon with a square handle will not sit comfortably in the hand [1], it would be dangerous to reach over the hot kettle to get a tea bag [1] **0–3**	**3**	
6(d)(iii)	Specific examples/evidence used to support conclusions e.g. design and layout of the controls on a vehicle [1], design and layout of a kitchen, texture and colour (red warning light) [1] **0–2**	**2**	

Question	Answer	Marks	Guidance
Section C			
7(a)	**Potted plants will not slide off** One pre-conceived idea presented **0–4** 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 includes the technical detail to show that the proposed solution would clearly work. **9–12** **Water must be able to be collected so it can be reused to access 10–12 marks** e.g. holes drilled in the tray with container underneath Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	
7(b)	**Frame attaches to the trolley and supports the shelves** One pre-conceived idea presented **0–4** 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 includes the technical detail to show that the proposed solution would clearly work. **9–12** **Must allow height adjustment of upper shelf to access 10–12 marks** e.g. holes with nuts and bolts Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	

Question	Answer	Marks	Guidance
7(c)	**Holder holds the label and attaches to the shelf** One pre-conceived idea presented **0–4** 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 includes the technical detail to show that the proposed solution would clearly work. **9–12** **Label must be easily changed and protected from moisture to access 10–12 marks** e.g. thin plastic cover slides over the label Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	
7(d)	The drawing will exhibit a reasonable standard of outcome and show some of the required design features **0–5** 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 shows 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**	**20**	

Question	Answer	Marks	Guidance
8(a)	**Instruction sheet shows how to play the game** One pre-conceived idea presented **0–4** 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 includes the technical detail to show that the proposed solution would clearly work. **9–12** **Must show how the game can be played without words to access 10–12 marks** e.g. images rather than words Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	
8(b)	**Method of joining the tiles together** One pre-conceived idea presented **0–4** 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 includes the technical detail to show that the proposed solution would clearly work. **9–12** **Tiles join together to make a play mat to access 10–12 marks** e.g. consideration of number edges that need to be shaped (male and female) Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	

Question	Answer	Marks	Guidance
8(c)	**Carrying case holds all the parts** One pre-conceived idea presented **0–4** 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 includes the technical detail to show that the proposed solution would clearly work. **9–12** **Instruction leaflet must be able to be seen when case is closed to access 10–12 marks** e.g. clear plastic window Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	
8(d)	The drawing will exhibit a reasonable standard of outcome and show some of the required design features **[0–5]** 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 shows 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]**	**20**	

Question	Answer	Marks	Guidance
9(a)	**Metal tube attached to the handrail** One pre-conceived idea presented **0–4** 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 includes the technical detail to show that the proposed solution would clearly work. **9–12** **Must be a temporary method of attachment to access 10–12 marks** e.g. nuts and bolts Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	
9(b)	**Raises and lowers the bucket** One pre-conceived idea presented **0–4** 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 includes the technical detail to show that the proposed solution would clearly work. **9–12** **Must be operated from the top of the scaffold to access 10–12 marks** e.g. handle at the top of the scaffold Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	

Question	Answer	Marks	Guidance
9(c)	**Audible and visual alarm** One pre-conceived idea presented **0–4** 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 includes the technical detail to show that the proposed solution would clearly work. **9–12** **Alarm must be activated when the bucket is moving to access 10–12 marks** e.g. movement activated circuit Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	
9(d)	The drawing will exhibit a reasonable standard of outcome and show some of the required design features **0–5** 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**	**20**	