Cambridge Assessment International Education

Cambridge International AS & A Level

DESIGN & TECHNOLOGY **9705/11**

Paper 1 **October/November 2021**

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 2021 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.

Section A

Question	Answer	Marks	Guidance
1(a)	Sketches and/or notes show: Layers of wood [1] Grain running at right angles on the different layers [1] **0–2**	**2**	Although labels and a sketch are anticipated, a sketch could score maximum marks.
1(b)(i)	Sketches and/or notes show: Centre of at least one hole shown [1] At least two marking out tools shown e.g. pencil, rule or try square [1] Evidence of centres being positioned evenly horizontally and vertically [1] Suitable drill bit shown [1] Suitable drill shown (hand or power) [1] Safety precaution when drilling e.g. eye protection, work clamped down [1] **0–6**	**6**	Accept laser cut holes.
1(b)(ii)	Sketches and/or notes show: Part A and B joined [1] Spacer strip/s shown [1] Strips do not block the vertical path of the counters [1] Method of joining (PVA glue, nails, screws …) [1] Details of appropriate tools and equipment e.g. hammer, cramp [1] Safety awareness e.g. demonstrate an understanding of safe working practices [1] **0–6**	**6**	

Question	Answer	Marks	Guidance
1(b)(iii)	Sketches and/or notes show: Suitable method identified e.g. cutting from a bar [1] **or** suitable method for producing a batch e.g. injection moulding [2] Method described [1] **or** in detail [2] Tools and/or equipment named [1] Safety awareness e.g. demonstrate an understanding of risk assessment [1] **0–6**	**6**	Accept by hand or using a hole saw.

Question	Answer	Marks	Guidance
2(a)	Exemplar answers: It is aesthetically pleasing [1] as it is a material with a nice shiny surface [1] It is corrosion resistant [1] so the surface will look good over time [1] **0–2**	**2**	
2(b)(i)	Sketches and/or notes show: Method of cutting the acrylic e.g. saw [1] Correct tool/machine named e.g. bandsaw [1] Use of file/scraper/plane [1] Use of wet and dry [1] Use of polish e.g. brasso [1] Safety precaution e.g. hold work firmly in a vice [1] **0–6**	**6**	

Question	Answer	Marks	Guidance
2(b)(ii)	Sketches and/or notes show: Centre for at least one hole shown [1] At least two marking out tools shown e.g. felt tipped pen, rule or try square [1] Method of alignment e.g. mark holes on one sheet of acrylic, tape to other sheet of acrylic and drill through both [1] Suitable drill bit shown [1] Suitable drill shown e.g. pillar drill [1] Safety precaution when drilling e.g. eye protection, work clamped down [1] **0–6**	**6**	Answers that use CAD/CAM, such as a laser cutter, are acceptable.
2(b)(iii)	Sketches and/or notes show: Preparation of the end of the bar [1] Correct tools/equipment e.g. die, die holder, cutting compound [0–2] Process e.g. use of dies, technique of turning [0–2] Safety precaution e.g. hold work firmly in a vice [1] **0–6**	**6**	Accept answers that cut the internal thread on a lathe.

Question	Answer	Marks	Guidance
3(a)	Properties include: Makes the paper waterproof [1] Adds rigidity to the paper [1] **0–2**	**2**	Other acceptable answers: • Easier to wipe clean • More hygienic More durable, so will last longer

Question	Answer	Marks	Guidance
3(b)(i)	Description of method used to produce the image e.g. cut out and stick on [1] Description of method used to produce the lettering e.g. stencil, CAD [1] Concept of layer (lettering on top of image) [1] Tools/equipment to produce the lettering/image e.g. marker pen, ruler [1–2] Safety awareness e.g. risk assessment [1] **0–6**	**6**	
3(b)(ii)	Description of method used to cut foam board to shape [1–2] Tools required to cut the foam board to shape e.g. craft knife [1] Method of joining the foam board together e.g. gluing [1] Appropriate glue named e.g. epoxy resin [1] Safety awareness e.g. use of cutting mat with a craft knife [1] **0–6**	**6**	
3(c)	Sketches and/or notes show: Single sheet of plastic use to make the menu holder [1] Menu holder will hold the menu (2 to 5 folds) [1] Description of method e.g. use of a line bender [1–2] Correct terms e.g. line bender [1] Good quality sketches [1] **0–6**	**6**	

Section B

Question	Answer	Marks	Guidance
4(a)	Feature X is designed so that money [1] can be put in the money box [1] **0–2**	**2**	
4(b)	Problem one identified [1] and described [1] Problem two identified [1] and described [1] e.g. No padding on the seat [1] so it would be uncomfortable [1] **0–4**	**4**	Other acceptable answers include: • end missing • insufficient glue tabs
4(c)	Explanation of how problem one could be overcome [0–3] Explanation of how problem two could be overcome [0–3] e.g. sixth surface added [1] in the correct position [1] and the correct shape [1] **0–6**	**6**	
4(d)(i)	Situation has been analysed and relevant issues/points identified Benefits of recycling e.g. no requirement to fell further trees [1], reduces the amount of incineration [1] promotes a 'green' image for the company [1] **0–3**	**3**	
4(d)(ii)	Clear and appropriate explanations of why issues/points are considered relevant e.g. cutting down trees is bad for wildlife [1], incineration produces CO_2 which contributes to global warming [1], many people like to buy 'green' products [1] **0–3**	**3**	
4(d)(iii)	Specific examples/evidence used to support conclusions e.g. recycle symbols on many products [1], products designed to be easily recycled [1] **0–2**	**2**	

Question	Answer	Marks	Guidance
5(a)	Feature X is bracing [1] to improve the rigidity of the storage rack [1] **0–2**	**2**	
5(b)	Problem one identified [1] and described [1] Problem two identified [1] and described [1] e.g. No handles [1] so it would be difficult to lift [1] **0–4**	**4**	Other acceptable answers include: • No bottom [1] so items would fall out [1] • Corriflute not strong enough for slats [1] so crate would collapse with heavier loads [1] • Cannot use PVA to glue corriflute to MDF [1] as it would pull apart [1]
5(c)	Explanation of how problem one could be overcome [0–3] Explanation of how problem two could be overcome [0–3] e.g. Add handles [1] by cutting holes [1] into both ends [1] **0–6**	**6**	Other acceptable problems include: • Attach a bottom [1] made from plywood [1] by screwing to the MDF ends [1] • Replace the corriflute slats [1] with plywood slats [1] and hold in position with screws [1] • The plywood slats [1] could be nailed [1] to the MDF ends [1]
5(d)(i)	Situation has been analysed and relevant issues/points identified e.g. feet can be raised or lowered [1] shelves can be in lots of different positions [1] hanging rack can be in five different positions [1] **0–3**	**3**	
5(d)(ii)	Clear and appropriate explanations of why issues/points are considered relevant e.g. some floors are uneven [1], moving the shelves allows different size crates to be stacked on shelves [1], moving the shelves allows different size objects to be stacked on shelves [1] **0–3**	**3**	
5(d)(iii)	Specific examples/evidence used to support conclusions e.g. widens the potential market [1], gives customers the opportunity to personalise the product [1] **0–2**	**2**	

Question	Answer	Marks	Guidance
6(a)	Exemplar answers: Customers demand fashionable/modern looking products [1] Fits in with existing decoration [1] **0–2**	**2**	Accept answers that refer to trendy, up-to-date…
6(b)	Problem one identified [1] and described [1] Problem two identified [1] and described [1] e.g. no plug [1] so could not connect to the mains [1] **0–4**	**4**	Other acceptable problems include: • no switch [1] so could not switch off [1] • base very small [1] so lamp would fall over [1] • joints 'locked' [1] so lamp cannot be adjusted [1]
6(c)	Explanation of how problem one could be overcome [0–3] Explanation of how problem two could be overcome [0–3] e.g. plug shown [1] in a suitable position on the mains cable [1] with explanation [1] **0–6**	**6**	Other acceptable problems include: • base shown [1] of a suitable size [1] with understanding of stability [1] • wing nuts shown [1] in a suitable position on the frame [1] with explanation of use [1]
6(d)(i)	Situation has been analysed and relevant issues/points identified e.g. people want products to look nice [1], people want products to match their other furniture [1] a finish can protect the material [1] **0–3**	**3**	
6(d)(ii)	Clear and appropriate explanations of why issues/points are considered relevant e.g. ferrous metals will rust/tarnish [1] pine can be painted [1], stainless steel can be lacquered [1] **0–3**	**3**	
6(d)(iii)	Specific examples/evidence used to support conclusions e.g. a nice finish appeals to customers [1], makes economic sense to add a protective finish as material will last longer [1] **0–2**	**2**	

Section C

Question	Answer	Marks	Guidance
7(a)	**Assembled at home** 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 would appear to technical detail to show that the proposed solution would clearly work **9–12** **Safety must be included to access 10–12 marks** Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	
7(b)	**Seat** 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 would appear to technical detail to show that the proposed solution would clearly work **9–12** **Must be able to store toys to access 10–12 marks** Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	

Question	Answer	Marks	Guidance
7(c)	**Ladder** 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 would appear to technical detail to show that the proposed solution would clearly work **9–12** **Must be detachable case to access 10–12 marks** 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 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**	

Question	Answer	Marks	Guidance
8(a)	**Tray** 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 would appear to technical detail to show that the proposed solution would clearly work **9–12** **Must hold three parts of the trophy and bottle of glue to access 10–12 marks** Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	
8(b)	**Development (net)** 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 would appear to technical detail to show that the proposed solution would clearly work **9–12** **Must have a window to access 10–12 marks** Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	

Question	Answer	Marks	Guidance
8(c)	**Instruction Leaflet** 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 would appear to technical detail to show that the proposed solution would clearly work **9–12** **Must have a logo to access 10–12 marks** 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 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**	

Question	Answer	Marks	Guidance
9(a)	**Holds screwdriver bits** 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 would appear to technical detail to show that the proposed solution would clearly work **9–12** **Screwdriver bits lock in/easily removed must be included to access 10–12 marks** Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	
9(b)	**Ergonomic design** 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 would appear to technical detail to show that the proposed solution would clearly work **9–12** **Must include a light to access 10–12 marks** Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	

Question	Answer	Marks	Guidance
9(c)	**Holds handle and bits** 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 would appear to technical detail to show that the proposed solution would clearly work **9–12** **Must clip onto a pocket to access 10–12 marks** 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**	