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DESIGN & TECHNOLOGY **9705/11**

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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.

Cambridge International is publishing the mark schemes for the October/November 2024 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 descriptions 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)	Exemplar answers: Oak [1] is resistant to damage from chemicals [1] Beech [1] is a close-grained hardwood [1] Mahogany [1] has an attractive appearance when varnished [1] **0–2**	**2**	
1(b)(i)	Notes and/or sketches show: Description of process of marking out and drilling explained [0-3] Tools and equipment for marking out e.g. pencil, rule, try square and for drilling holes e.g. pillar drill, hole saw [0–2] Safety precaution when drilling e.g. eye protection, work clamped down [0–1] **0–6**	**6**	
1(b)(ii)	Notes and/or sketches show: Description of process [0–3] Tools and/or equipment and method for producing a batch e.g. injection moulding, mould, pressure. [0–2] Safety awareness e.g. demonstrate an understanding of risk assessment, gloves as a hot product [0–1] **0–6**	**6**	
1(c)	Notes and/or sketches describe: Description of temporary joining method, screw [0–3] Tools and equipment and process of securing, marking out, drilling [0–2] Safety precautions. eye protection, work clamped down [0–1] **0–6**	**6**	

Question	Answer	Marks	Guidance
2(a)	Exemplar answers: Easy to cut to shape [1] Offers a degree of protection against impact [1] Can be recycled [1] Smooth surfaces on which images/text can be printed [1] Lightweight [1] **0–2**	**2**	AOVR Do not accept easy to fold unless clear understanding of the direction of the ribs shown.
2(b)	Notes and/or sketches show: **Shape of development (net)** Any shape development shown [1] or correct shape to make the package (six surfaces) [2] Development shows some fold lines [1] or all fold lines in appropriate positions [2] Development shows three cut outs for the bulb [1] or three cut outs on appropriate surfaces (one circle and two ellipses) [2] **0–6**	**6**	
2(c)	Notes and/or sketches show: Description of process of marking out/cutting out explained [0–3] Tools and equipment for marking out e.g. pencil, rule, try square and cutting out shape e.g. craft knife, safety rule, cutting mat [0–2] Safety precaution when drilling e.g. keep fingers away from craft knife blade, use a safety rule. [0–1] **0–6**	**6**	Answers that use CAD/CAM, such as a laser cutter, are acceptable.
2(d)	Notes and/or sketches describe: A suitable method of holding together e.g. arrowhead that pushes through the slot and a suitable method of hanging e.g. hole or hook shape that hangs on a rod [0–3] Description of modification [0–3] **0–6**		

Question	Answer	Marks	Guidance
3(a)	Exemplar answer: The clamp has rubber jaws to protect [1] the work from damage whilst being gripped in the jaws. [1] **0–2**	**2**	AOVR
3(b)(i)	Notes and/or sketches show: Description of process [0–3] Tools and/or equipment named for producing the body of the clamp e.g. sand casting, mould, molten metal [0–2] Safety awareness e.g. correct use of PPE whilst casting [0–1] **0–6**	**6**	Also accept: • machining from a block of aluminium
3(b)(ii)	Notes and/or sketches show: Description of process including parallel and taper turning [0–3] Tools and/or equipment named for producing the handle of the clamp e.g. marking, turning, lathe, parts of lathe. [0–2] Safety awareness e.g. use of eye protection when turning [1] **0–6**	**6**	AOVR
3(c)	Notes and/or sketches describe: How the clamping mechanism works showing the handle, clamping mechanism, jaws, cam and spring (compressed and expanded) is to move the jaw back when the handle is released [0–3] Description of mechanism [0–3] **0–6**	**6**	

Section B

Question	Answer	Marks	Guidance
4(a)	Feature X is a magnetic catch [1] that will hold the door of the cabinet shut [1] **0–2**	**2**	
4(b)	Problem one identified [1] and described [1] Problem two identified [1] and described [1] e.g. no handle on the door [1] so it would be difficult to open [1] **0–4**	**4**	Other acceptable answers include: • No means of fastening [1] the cupboard to a wall • No mirror [1] on the door [1] • No shelves [1] inside the cupboard to put items on [1]
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 button handle [1] in the correct position on the door [1] so it can be pulled open [1] **0–6**	**6**	Add mirror plates [1] to the back edges of the cabinet [1] so that it can be attached to a wall with screws and raw plugs [1] Add a groove [1] to the frame of the door [1] so that a mirror can fit into it [1] Add shelves to the inside of the cabinet [1] that rest on dowels/pegs [1] and allow more space for storage of items [1]
4(d)(i)	Situation has been analysed and relevant issues/points identified e.g. no requirement for customer to assemble [1], no need to include instructions, tools or adhesives [1] eliminates the chances of the product being assembled incorrectly [1] **0–3**	**3**	
4(d)(ii)	Clear and appropriate explanations of why issues/points are considered relevant e.g. some customers do not have the skills to assemble a product at home [1], instructions, tools and adhesives are an additional cost [1], fully assembled products eliminate the chances of incorrect assembly damaging reputation of company [1] **0–3**	**3**	

Question	Answer	Marks	Guidance
4(d)(iii)	Specific examples/evidence used to support conclusions e.g. higher quality products, such as kitchen cabinets, usually come fully assembled [1], the manufacture can only fully guarantee the performance of a product, such as a chair, if they have assembled it. [1] **0–2**	**2**	

Question	Answer	Marks	Guidance
5(a)	Feature X identifies the type of plastic (polystyrene) [1] and is used for recycling purposes [1] **0–2**	**2**	
5(b)	Problem one identified [1] and described [1] Problem two identified [1] and described [1] e.g. Round trays difficult to be vacuum formed. [1] due to lack of draft angles [1] **0–4**	**4**	Other acceptable answers include: • No means of joining [1] the round trays [1] • No means of joining [1] the development (net) [1] • Edge/end too narrow [1] to hold the trays [1] • Centre cut out [1] the wrong shape [1]

Question	Answer	Marks	Guidance
5(c)	Explanation of how problem one could be overcome [0–3] Explanation of how problem two could be overcome [0–3] e.g. The mould for the trays [1] needs to have sloping sides [1] so the shape can removed from the mould [1] **0–6**	**6**	Other acceptable problems include: • One tray [1] needs to be slightly larger [1] so that it can slide over the other and become a lid [1] • Add a glue tab [1] to one end of the development (net) [1] so that it will hold together [1] • Make the edge [1] equal to the height of the two trays [1] when they are fully assembled [1] • The curves [1] in the centre cut out [1] should be in the opposite direction [1]
5(d)(i)	Situation has been analysed and relevant issues/points identified e.g. packaging more concerned with promoting a product rather than environmental issues [1] packaging often excessive in terms of materials used [1] packaging not always designed with recycling in mind [1] **0–3**	**3**	
5(d)(ii)	Clear and appropriate explanations of why issues/points are considered relevant e.g. profits are greatly increased by the number of products sold [1], excessive packaging can make products seem larger than they really are and so more appealing to customers[1], manufacturers are not responsible for the packaging, just the product [1] **0–3**	**3**	
5(d)(iii)	Specific examples/evidence used to support conclusions e.g. amount of packaging that is collected from homes for recycling [1], increased use of sustainable materials in packaging, such as cornstarch foam [1] **0–2**	**2**	

Question	Answer	Marks	Guidance
6(a)	Exemplar answers: Additional information [1] such as day, date, alarm are needed on an alarm clock [1] **0–2**	**2**	
6(b)	Problem one identified [1] and described [1] Problem two identified [1] and described [1] e.g. aluminium [1] cannot be vacuum moulded [1] **0–4**	**4**	Other acceptable problems include: • Batteries [1] won't fit [1] • No means of opening [1] the case to put batteries in [1] • No means of folding [1] the case [1] • Insufficient switches/controls on/off [1] switch protrudes [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. select a thermoplastic for the case [1] such as polypropylene [1] so that it can be vacuum moulded [1] **0–6**	**6**	Other acceptable problems include: • make the case larger [1] so that the batteries [1] will fit in [1] • make sure the case [1] has a lid with a catch [1] so that it can be opened and closed [1] • add a hinge [1] to the case [1] so that it can fold and close [1] • Add further switches [1] to adjust time [1] or set the alarm [1]
6(d)(i)	Situation has been analysed and relevant issues/points identified e.g. colour offers choice to purchasers [1], the colour can change the appearance of a product [1] changing the colour of a product is low cost as tooling is not changed [1] **0–3**	**3**	

Question	Answer	Marks	Guidance
6(d)(ii)	Clear and appropriate explanations of why issues/points are considered relevant e.g. customers often purchase products to match existing decoration [1] red can make a product stand out, chrome make it look expensive, black sophisticated. [1] makes economic sense for manufacturers to offer choice with little additional cost [1] **0–3**	**3**	
6(d)(iii)	Specific examples/evidence used to support conclusions e.g. most household products, such as clocks, are available in a range of colours [1], mobile phone cases are available in a range of colours [1] **0–2**	**2**	

Section C

Question	Answer	Marks	Guidance
7(a)	**Frame holds the trays in position** 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** **Trays must be removed for cleaning 10–12 marks** Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	
7(b)	**Base attaches to the frame designed in part (a)** 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 rotate 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)	**Handle attaches to the frame designed in part (a)** 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** **Handle must hold the card label 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)	**One-piece development (net) that makes a Corriflute sign** 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** **Sign must be freestanding to access 10–12 marks** Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	
8(b)	**System prevents the sign blowing away in the wind** 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** **System must not attach to the pavement or shop front 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)	**Method of holding the A1 size paper** 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 also hold the felt tipped pen 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)	**Magnet moves along the gantry** 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** **Magnet must be able to stop at any position to access 10–12 marks** Clarity and quality of sketching and explanatory notes **0–4** Evaluation (reasons for selection) **0–4**	**20**	
9(b)	**Magnet able to be lowered and raised** 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 raised and lowered 80mm 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)	**Indication given when the magnet picks up a disk** 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 a visual indication 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**	