CAMBRIDGE
International Education

Cambridge International AS & A Level

DESIGN & TECHNOLOGY **9705/32**

Paper 3 A Level Written Paper **May/June 2026**

MARK SCHEME

Maximum Mark: 100

Published

This mark scheme contains the instructions and marking guidance that our examiners used to mark candidate responses for this component.

Before they start marking, examiners complete a standardisation process. They review a range of candidate responses and discuss the mark scheme in detail to agree which answers can and cannot be accepted. Examiners award marks where it is clear that candidate responses have met the requirements of the mark scheme. These requirements may vary between different components or different versions of the same component, depending on the exact requirements of the question and the candidate responses seen during the standardisation process.

Sometimes, our mark schemes may allow marks to be awarded to responses which contain elements that are factually incorrect or for content not covered by the syllabus. We do this in response to the demands of a specific question to support candidates and make sure that our assessments are fair. However, these allowances should not be used as a guide for teaching and learning.

We cannot discuss the mark scheme with schools, and we recommend that schools read the mark scheme together with the assessment material and the Principal Examiner Report for Teachers.

This document consists of **36** printed pages.

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General marking principles

All examiners must apply these marking principles when marking candidate responses.

1	Examiners must award marks for each response in line with: • the specific **content** defined in the mark scheme • the specific **skills** defined in the mark scheme or in the level descriptions • the **standard of response** required as exemplified by the standardisation scripts.
2	Examiners must award **whole marks** (not half marks, or other fractions).
3	Examiners must award marks **positively**. This means that: • marks are not deducted for errors or omissions • marks are awarded for correct/valid answers as defined in the mark scheme and also for **other valid answers** which go beyond the scope of the syllabus and mark scheme referring to your team leader as appropriate • the quality of spelling, punctuation and grammar are judged **only** when the mark scheme indicates that these features are **specifically assessed** in the question. However, the meaning of all responses must be unambiguous.
4	Examiners must **consistently** apply the requirements of the mark scheme and any rules for what to do when candidates have not followed instructions correctly.
5	Examiners must use the **full range of marks** defined in the mark scheme, unless limited by the quality of the candidate responses seen.
6	Examiners must award marks according to the mark scheme and **must not** award marks with grade thresholds or grade descriptions in mind.

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Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
✔	Correct point – mark(s) awarded
BOD	Benefit of doubt given – mark(s) awarded
Highlighter	Creditworthy response – highlight key points
REP	Repetition
L0	Marking level achieved
L1	Marking level achieved
L2	Marking level achieved
L3	Marking level achieved
L4	Marking level achieved
L5	Marking level achieved

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Annotation	Meaning
SEEN	Page or response seen by examiner

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Question	Answer	Marks	Guidance
1(a)	**State a suitable material for the photograph holder shown in Figure 1.1. Give two reasons to justify your choice.** Award up to **one** mark for an appropriate material. Award up to **one** mark for **each** appropriate reason up to a maximum of **two** marks. The reasons must be relevant to the chosen material. Answers could be: Material: Pine/Beech/flexiply Reasons: • Beech veneers can be laminated to form some of the shape • It can be fabricated and joined to create shape using PVA • It can look attractive with appropriate finish Material: Aluminium Reasons: • It is easy to bend to shape • It is lightweight for ease of portability • It can have a matt or polished finish Material: Acrylic/HIPS Reasons: • It can be fabricated and joined to create shape using Tensol cement • It is easy to bend using heat and formers • It is available in a range of colours Accept all valid responses.	3	Do not allow aesthetically pleasing unless clarified.

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Question	Answer	Marks	Guidance
1(b)	**Use sketches and notes to show how you would make one photograph holder, as shown in Figure 1.1, in a school workshop. In your response, you should give details of any tools and equipment you would use.** This question has a total of 9 marks. Instructions on how to mark this question follow on further pages. Knowledge and Understanding = **3** marks Application = **4** marks Communication = **2** marks To award full marks, answers must: • include the manufacturing method for all parts of the photograph holder • identify the correct tools and equipment. Full details of CAD drawing and set up are required for 3D printing answers. Responses may include some of the following ideas, but all valid material must be credited. Methods of making the photograph holder could be: • Mark out and cut each component part • Cut out rectangular shape, • Finish/polish edges • Two parts could be joined at correct angle or steam bent • Part could be laminated using beech veneers • Use PVA to join parts for photo slide, join to back face of main component. • Mark out and cut aluminium parts or cut out in one piece • Cut out rectangular shape, finish all edges • Use formers, bending jigs to shape photo guides and angle	**9**	

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1(b)</td><td>

Ensure no sharp edges, finish with appropriate abrasives, polish
Mark out and cut each component part or cut out in one piece,
Cut rectangular shape, use strip heater and former to bend to required angle (photo guides could also be bent to shape prior to angle bending)
Finish/polish the edges not to be glued
Use Tensol cement to join parts for photo slide, join to back face of bent component.
Use appropriate abrasive to finish, polish faces and edges

Accept all valid responses.

To mark this question:

First, award up to a maximum of three marks using the marking grid for AO1a
Knowledge and understanding.

Marking grid for AO1a Knowledge and understanding

Candidates should be able to:

Demonstrate knowledge and understanding of a range of materials, tools, equipment and components used in design and technological activity. (AO1a)

<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>Level 2</td><td>Clear and detailed knowledge and understanding of an appropriate range of tools and equipment. (AO1a)</td><td>2–3</td></tr>
<tr><td>Level 1</td><td>Partial knowledge and understanding of an appropriate range of tools and equipment. (AO1a)</td><td>1</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
</table>
</td><td></td><td></td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1(b)</td><td>

Second, award up to a maximum of **four** marks using the marking grid for AO2a Application of knowledge and understanding.

Marking grid for AO2a Application of knowledge and understanding

Candidates should be able to:
- Apply knowledge, understanding and skills in a variety of contexts. (AO2a)

<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>Level 2</td><td>Clear and detailed application of knowledge and understanding of an appropriate range of tools and equipment for the product. (AO2a)</td><td>3–4</td></tr>
<tr><td>Level 1</td><td>Partial application of knowledge and understanding of an appropriate range of tools and equipment for the product. (AO2a)</td><td>1–2</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
</table>

</td><td></td><td></td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1(b)</td><td>

Third, award up to a maximum of **two** marks using the marking grid for AO2b Communication using sketches and notes.

Marking grid for AO2b Communication using sketches and notes

Candidates should be able to:
- Communicate knowledge and understanding using sketches, notes and a range of graphical techniques, including conventions and specialist vocabulary. (AO2b)

<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>Level 2</td><td>Clear and easily understood. (AO2b)</td><td>2</td></tr>
<tr><td>Level 1</td><td>Partial communication. (AO2b)</td><td>1</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
</table>

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</table>

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Question	Answer	Marks	Guidance
1(c)	**Use sketches and notes to describe the changes which may be necessary to the design, the manufacturing method and the material selected, to produce 50 identical photograph holders.** This question has a total of 8 marks. Instructions on how to mark this question follow on further pages. Materials and manufacturing = (2+2) = **4** marks Communication = **4** marks **To mark this question:** Give a total of up to **four** marks by: **First**, awarding up to a maximum of **two** marks for the materials Answers could include: <u>Materials, design</u> • Change/no change with reasoning • ABS • Appropriate hardwood **Second**, awarding up to a maximum of **two** marks for the manufacturing method. Answers could include: <u>Manufacturing method</u> • Templates /jigs • Simplified design and assembly • Tessellation on laser cutter • Use of 3D printer to print multiple products/parts Accept all valid responses.	**8**	Do not accept unsuitable processes such as injection moulding. Appropriate material with clear justification

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1(c)</td><td>

Third, award up to a maximum of **four** marks using the marking grid for AO2b Communication using sketches and notes.

Marking grid for AO2b Communication using sketches and notes

Candidates should be able to:
- Communicate knowledge and understanding using sketches, notes and a range of graphical techniques, including conventions and specialist vocabulary. (AO2b)

<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>Level 2</td><td>• The sketches are detailed and are successfully communicated with precision and clarity. (AO2b)
• The sketches have detailed and correct annotations, including where relevant appropriate conventions and specialist vocabulary. (AO2b)</td><td>3–4</td></tr>
<tr><td>Level 1</td><td>• Partial communication through simple sketches. (AO2b)
• The sketches have limited annotations, with limited conventions and specialist vocabulary. (AO2b)</td><td>1–2</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
</table>

</td><td></td><td></td></tr>
</table>

Question	Answer	Marks	Guidance
2(a)	**Figure 2.1 shows a kayak produced by rotational moulding.** **Use sketches and notes to show the process of rotational moulding.** This question has a total of 4 marks. Instructions on how to mark this question follow below. Process = **2** marks Communication = **2** marks **To mark this question:** **First**, award up to **one** mark for detail of rotational mould requirement of heat. **Second**, award up to **one** mark for detail of rotational mould requirement of rotation. Answers could include: • Fill the hollow mould with powdered plastic resin. • Initiate bi-axial rotation of the mould. • Transfer the rotating mould into an oven. • Maintain the rotation while the resin melts and evenly coats the inner walls of the mold. • Cool the rotating mould to allow the resin to harden and take the desired shape	**4**	

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>2(a)</td><td>

Third, award up to **two** marks for the quality of the communication using the marking grid for AO2b Communication using sketches and notes.

Marking grid for AO2b Communication using sketches and notes

Candidates should be able to:
- Communicate knowledge and understanding using sketches, notes and a range of graphical techniques, including conventions and specialist vocabulary. (AO2b)

<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>Level 2</td><td>Clear and easily understood, showing force applied and indentation shape. (AO2b)</td><td>2</td></tr>
<tr><td>Level 1</td><td>Partial communication. (AO2b)</td><td>1</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
</table>

</td><td></td><td></td></tr>
<tr><td>2(b)</td><td>

Explain what is meant by the term ‘marketable product’.

Answers could be:
- A marketable product is a product that will appeal to buyers [1]
- and sell at a certain price range [1]
- A marketable product is easy to sell [1] because a lot of people want it/them: meets a specific need [1]
- A marketable product will be popular [1] and generate a profit.[1]
- A manufacturer with a marketable product may be able to choose who they wish to distribute it [1] and by this, the manufacturer can increase the exclusivity or demand of the product [1]

Accept all valid responses.

</td><td>**2**</td><td></td></tr>
</table>

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Question	Answer	Marks	Guidance
2(c)	**Explain two reasons why a manufacturing specification is produced**. Award up to **two** marks for each relevant reason. Award up to **one** additional mark for an appropriate explanation of each reason. Any two reasons from: • a manufacturing specification is a focussed alternative [1] to producing several separate sheets [1] saving time/improving communication between designer and manufacturer • a manufacturing spec is a concise sheet, [1] which summarises the manufacturing flow chart, sequence drawing and final 3D drawing.[1] ensuring correct production/equipment chosen/used • it clarifies [1] the necessary detail to ensure correct manufacture a product [1], no misunderstandings or errors • it ensures that all relevant information is included [1] and linked to a finished good [1] • Accept all valid responses.	**4**	

Question	Answer	Marks	Guidance
3(a)	**Explain the growth stage in a product's life cycle.** Award up to **one** mark for the basic concept of growth relating to increasing sale of products. Award up to a maximum of **two** additional marks for an appropriate explanation. Exemplar answers: • the growth stage of the product life cycle is the third stage [1] in the product life cycle. This stage is considered critical in establishing a product's position in the market [1], increasing sales, and improving profit margins.[1] • the growth stage sees the increase in demand for the product [1] also profits. [1] The product's market expanding [1] • sales volume is increasing fast [1] during the growth phase, more suppliers are stocking the product [1] as promotional offers start bringing in more customers [1] • Other companies start to notice the product [1] as it starts getting more attention from customers who are buying the product and generating more revenue/customer loyalty increases [1] Accept all valid responses.	**3**	

Question	Answer	Marks	Guidance
3(b)	**Explain one disadvantage of updating packaging as a product extension strategy.** Award up to **one** mark for the identification of a valid disadvantage. Award up to a maximum of **two** additional marks for an appropriate explanation. Disadvantages could be: • if changes are too bold [1] or too many changes are made at once.[1] the new packaging can be unrecognizable to existing customers [1] • packaging may not convey the brand message [1] and meet the expectations of your customers.[1] An unpopular new design may create dissonance that can be hard to recover from. [1] • a new colour scheme [1] may confuse loyal customers [1] and associate the product as entirely different from the one they were used to. [1] • increase cost [1] time and cost to review/update [1] high cost to pay a designer and/or for reprinting. Accept all valid responses.	**3**	

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Question	Answer	Marks	Guidance
3(c)	**Explain two factors that would determine the unit cost of a product.** Award up to **two** marks for each relevant factor. Award up to **one** additional mark for an appropriate explanation of each factor. Any two factors from: • economies of scale, the cost per unit decreases [1] as production volume increases. [1] • a rise in the raw materials cost [1] can lead to an increase in the cost per unit. [1] • Automation, and lean practices [1] providing enhanced efficiency has impact on unit cost [1] • Fluctuations in energy costs [1] have impact on unit cost [1] • Rise in the cost of labour [1] can lead to an increase in the cost per unit. [1] Accept all valid responses.	**4**	

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Question	Answer	Marks	Guidance
4(a)	**Describe the function of the design and development service sector in the design and manufacturing industry.** Award up to **one** mark for an appropriate function stated. Award up to **one** mark for a relevant description of the function. Exemplar answers: • The design and development sector would check whether the product meets a market need [1] and whether it will sell at the price needed to make a profit.[1] • It generally starts with idea generation and idea screening,[1] concept development, business analysis, prototyping, testing, and product launch.[1] • It combines designing systems and development methodologies [1] to enhance the overall performance of the product for the customer and the environment. [1] • It transforms concepts into prototypes for testing, validating and improvement [1] for whatever volume production is required. [1] Accept all valid responses.	**2**	

Question	Answer	Marks	Guidance
4(b)	**Explain one benefit to employees of mass production systems.** Award up to **one** mark for an appropriate benefit Award up to **one** mark for a relevant explanation of the benefit Benefit could be: • Employees with specific skills [1] may feel more secure in their careers because they are harder to replace.[1] • Increased worker safety, [1] fewer strenuous/dangerous jobs [1] some workers may prefer uniform/repetitive tasks as this may help them to be productive and increase their earnings [1] • Mass production has helped to create new jobs [1] for individuals to teach special skills and train workers. [1] • Higher level of precision/efficiency [1] which produces much higher quality products/allows better quality control. [1] Accept all valid responses.	**2**	

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Question	Answer	Marks	Guidance
4(c)	**Discuss the importance of digital technology in the development of products.** Use the marking grid for AO4d Analysis of the wider issues in design and technology to mark candidates' responses to this question. Responses may include some of the following ideas, but all valid material must be credited. • Digital technologies provide new communication capabilities, increasing device interconnectedness to speed up development of products • Advanced CAD is quicker, more accurate and easily shared with individuals or groups in the development team • Simulation software can check functionality and identify problems to resolve • Huge access to data required regarding properties of materials and availability and quality of components for example • Huge range of digital devices available which can be adapted and combined to explore testing opportunities to inform development decision making • Increased us of augmented reality relies upon advanced digital technology • Digital technologies can streamline processes used to develop products, foster collaboration, increase employee skills that help contribute to develop more innovative products **Marking grid for AO4d Analysis of wider issues in design and technology** Candidates should be able to: • Analyse wider issues in design and technology (including cultural, economic, environmental and social factors). (AO4d)	**6**	

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>4(c)</td><td>
<table>
<tr><th>Level</th><th>Descriptions</th><th>Marks</th></tr>
<tr><td>Level 3</td><td>Analysis of more than two wider issues with relevant and detailed information

• Detailed discussion of more than two wider issues in design and technology. (AO4d)
• The analysis is well supported with relevant and detailed information. (AO4d)</td><td>5–6</td></tr>
<tr><td>Level 2</td><td>Analysis of at least two wider issues with relevant information

• Discussion of at least two wider issues in design and technology. (AO4d)
• The analysis is supported with relevant information. (AO4d)</td><td>3–4</td></tr>
<tr><td>Level 1</td><td>Description of at least one wider issue with limited relevant information

• Description of at least one wider issue in design and technology. (AO4d)
• The description is supported with limited relevant information. (AO4d)</td><td>1–2</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
</table>
</td><td></td><td></td></tr>
</table>

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Question	Answer	Marks	Guidance
5(a)	**Describe one benefit of using technical drawing software in the designing of products.** Award up to **one** mark for appropriate benefit Award up to **one** additional mark for explanation. Benefit could be: • high quality and accurate drawings produced [1] meaning greater understanding of drawings [1] • technical drawing software allows designers to iterate and refine their drawings quickly [1] allowing for faster/more efficient designing. [1] • more effective final outcome [1], resulting in higher quality final products/better quality control [1] • technical drawing software enables collaboration between team members and stakeholders [1] increasing efficient communication between stakeholders [1] • technical drawing software tools can create realistic 3D images from technical drawings [1] increasing the communication of the drawing [1] Accept all valid responses.	**2**	

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Question	Answer	Marks	Guidance
5(b)	**Explain how a template is used when designing and making products.** Award up to **one** mark for understanding of template Award up to **one** additional mark for an appropriate explanation. Explanation could include: • template is a tool used to mark out shapes accurately [1] and repeatedly by allowing the designer to draw around it/in it to repeat drawing a shape. [1] • using templates means that manufacturers ensure a more consistent quality in their products [1] improving overall quality and keeping consumer loyalty [1] Accept all valid responses.	**2**	Place template onto material [1] to draw and cut around accurately/repeatedly [1]. Use a drawing/design template [1] to use as a starting point to modify [1] Award up to 2 marks for a single point fully explained and justified.

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Question	Answer	Marks	Guidance
5(c)	**Discuss the benefits of a company employing a continuous improvement process such as Kaizen.** Use the marking grid for AO4d Analysis of the wider issues in design and technology to mark candidates' responses to this question. Responses may include some of the following ideas, but all valid material must be credited. Benefits of Kaizen could be: • sorting in a wide sense – sorting through the workplace and keep only what is needed – no clutter, no distractions, lowers costs, reduces waste, better management of resources • Evaluate what needs removing, parts or tools you do not use, for safety and efficiency • set up tools, machinery and equipment so employees can easily select and use them – no time wasted, increases productivity • cleaning and inspection are important. It helps to keep equipment and machinery in good order with less deterioration. Sense of pride in workplace leads to pride in work, improved quality • Sustaining practices ensure that employees know what to do intuitively. Training and feedback are critical for improved co-operation and communication. **Marking grid for AO4d Analysis of wider issues in design and technology** Candidates should be able to: • Analyse wider issues in design and technology (including cultural, economic, environmental, and social factors). (AO4d)	**6**	Focus should be on continuous improvement of the manufacturing process, not improvement of the actual product.

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>5(c)</td><td>
<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>Level 3</td><td>Analysis of more than two wider issues with relevant and detailed information

• Detailed discussion of more than two wider issues in design and technology. (AO4d)
• The analysis is well supported with relevant and detailed information. (AO4d)</td><td>5–6</td></tr>
<tr><td>Level 2</td><td>Analysis of at least two wider issues with relevant information

• Discussion of at least two wider issues in design and technology. (AO4d)
• The analysis is supported with relevant information. (AO4d)</td><td>3–4</td></tr>
<tr><td>Level 1</td><td>Description of at least one wider issue with limited relevant information

• Description of at least one wider issue in design and technology. (AO4d)
• The description is supported with limited relevant information. (AO4d)</td><td>1–2</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
</table>
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</table>

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Question	Answer	Marks	Guidance
6(a)	**Use sketches and notes to produce two different innovative ideas for the study unit** This question has a total of 12 marks. Instructions on how to mark this question follow on further pages. **(i)** Idea 1 = 2+4 marks (**6** marks in total) **(ii)** Idea 2 = 2+4 marks (**6** marks in total) **To mark this question:** For **each** innovative idea, part (**i**) and part (**ii**) • **First**, award up to **two** marks using the marking grid for AO2b Communication using sketches and notes. • **Second**, award up to **four** marks using the marking grid for AO3c Generate conceptual ideas. The two ideas must be different from each other. The design ideas may include some of the following ideas, but all valid material must be credited. • Could be free-standing or fitted to wall • Could include other features such as storage • Could be styled to particular game theme • Could be modular for different configurations • Innovative adjustment or assembly methods **Marking grid for AO2b Communication using sketches and notes** Candidates should be able to: • Communicate knowledge and understanding using sketches, notes and a range of graphical techniques, including conventions and specialist vocabulary. (AO2b)	**12**	

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>6(a)</td><td>
<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>Leve 2</td><td>Clear and easily understood.</td><td>2</td></tr>
<tr><td>Level 1</td><td>Partial communication. (AO2b)</td><td>1</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
</table>

Marking grid for AO3c Generate conceptual ideas

Candidates should be able to:
• Generate conceptual ideas and evaluate them, leading to the creation of a design proposal. (AO3c)
<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>Level 3</td><td>• Generates one complete valid conceptual idea. The conceptual idea is fully supported. (AO3c)
• Clear reference to design specification. (AO3c)</td><td>4</td></tr>
<tr><td>Level 2</td><td>• Generates one complete conceptual idea. The conceptual idea has some supporting information. (AO3c)
• Some reference to design specification. (AO3c)</td><td>2–3</td></tr>
<tr><td>Level 1</td><td>• Generates one partially complete conceptual idea. The conceptual idea has limited supporting information. (AO3c)
• Limited or no reference to design specification. (AO3c)</td><td>1</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
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</td><td></td><td></td></tr>
</table>

Question	Answer	Marks	Guidance
6(b)	**Evaluate your <u>two</u> ideas for the study unit to select a final proposal for development. Justify your selection.** Award up to **one** mark for the decision with justification. Award up to **one** mark for the comparison of the two design ideas. Award up to **one** mark for the evaluation. Accept an answer which includes sketches and annotations as necessary. • A clear justification of the choice with an explanation • Clear comparisons should be made • Evaluations should consider the specification points given in the question • Sketches and notes may be used to support evaluations Candidates can answer this question in a variety of ways. Accept all valid responses.	**3**	

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Question	Answer	Marks	Guidance
6(c)	**Use sketches and notes to develop your chosen idea to show details of functions, materials, construction and finishes.** This question has a total of 10 marks. Instructions on how to mark this question follow on further pages. Functions, materials, construction and finishes = **8** marks Communication = **2** marks **To mark this question:** **First**, give a total of up to **eight** marks by using the following: <u>Functions</u> Award up to a maximum of **three** marks: • Award **one** mark for one key function described. • Award **two** marks for two key functions described. • Award **three** marks for more than two functions described. <u>Materials</u> Award up to a maximum of **two** marks: • Award **one** mark for naming one or more relevant material. • Award **one** mark for the justification of use of the material. <u>Construction</u> Award up to a maximum of **two** marks: • Award **one** mark for some detail of construction/assembly. • Award **two** marks for clear detail of construction/assembly. <u>Finishes</u> Award **one** mark for an appropriate finish.	**10**	

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>6(c)</td><td>

Second, award up to **two** marks using the marking grid for AO2b Communication using sketches and notes.

Marking grid for AO2b Communication using sketches and notes

Candidates should be able to:
- Communicate knowledge and understanding using sketches, notes and a range of graphical techniques, including conventions and specialist vocabulary. (AO2b)

<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>Level 2</td><td>Clear and detailed sketches and notes. (AO2b)</td><td>2</td></tr>
<tr><td>Level 1</td><td>Simple sketches with some notes included. (AO2b)</td><td>1</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
</table>

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Question	Answer	Marks	Guidance
6(d)	**Use a method of your own choice to draw the complete design solution. Include key details and dimensions.** This question has a total of 8 marks. Instructions on how to mark this question follow on further pages. Communication = **4** marks Finalise = **4** marks Candidates may use component drawings with an assembled product sketch. Pictorial/perspective sketches should include all details and dimensions. Annotation may be used to describe key features. Appropriate drawings could be dimensioned orthographically or isometrically. **To mark this question:** **First**, award up to a maximum of **four** marks using the marking grid for AO2b Communication using sketches and notes.	**8**	

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>6(d)</td><td>

Marking grid for AO2b Communication using sketches and notes

Candidates should be able to:
- Communicate knowledge and understanding using sketches, notes and a range of graphical techniques, including conventions and specialist vocabulary. (AO2b)

<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>Level 2</td><td>Clear and easily understood.</td><td>3–4</td></tr>
<tr><td>Level 1</td><td>Partial communication. (AO2b)</td><td>1–2</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
</table>

Second, award up to a maximum of **four** marks using the marking grid for AO3d Finalise a design proposal.

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>6(d)</td><td>

Marking grid for AO3d Finalise a design proposal

Candidates should be able to:
- Refine and develop procedures to finalise a design proposal, recognising the constraints of time, cost and resources, and plan for making. (AO3d)

<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>Level 2</td><td>The design proposal is realistic and includes most design/product details. (AO3d)</td><td>3–4</td></tr>
<tr><td>Level 1</td><td>The design proposal includes some design/product details. (AO3d)</td><td>1–2</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
</table>

Candidates may use component drawings with an assembled product sketch.

Pictorial/perspective sketches should include all details and dimensions. Annotation may be used to describe key features.

</td><td></td><td></td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>6(e)</td><td>

Write a detailed <u>manufacturing</u> specification for your chosen idea. Your answer should include at least <u>four</u> different manufacturing specification points.

Award marks based on the following criteria.

<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>Level 5</td><td>Four or more detailed manufacturing specification points covered and clearly described.</td><td>5</td></tr>
<tr><td>Level 4</td><td>Three points covered and clearly described.</td><td>4</td></tr>
<tr><td>Level 3</td><td>Two points covered and clearly described.</td><td>3</td></tr>
<tr><td>Level 2</td><td>One point covered and clearly described.</td><td>2</td></tr>
<tr><td>Level 1</td><td>One point covered but not clearly described.</td><td>1</td></tr>
<tr><td>Level 0</td><td>No creditable response.</td><td>0</td></tr>
</table>

</td><td>**5**</td><td></td></tr>
</table>

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Question	Answer	Marks	Guidance
6(e)	The manufacturing specification could include the following, but all valid material must be credited: <u>Specific materials used:</u> • Appropriate for study unit <u>Bought in components/parts:</u> • Appropriate for study unit <u>Construction/assembly details:</u> • Appropriate for study unit <u>Finish to be applied:</u> • Appropriate for study unit <u>Allowable tolerance:</u> Appropriate for study unit		

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Question	Answer	Marks	Guidance
6(f)	**Explain one advantage of using modelling when designing a product such as a study unit.** Award up to **one** mark for the appropriate advantage. Award up to **one** mark for a relevant explanation of the advantage. Any **one** advantage from: • 2D model of mechanism e.g. a linkage [1] can test functional suitability [1] • 3D models allow clients [1] to see a better representation of concept for feedback [1] • Architectural 3D models [1] clearer to show interconnectivity of rooms and access home [1] • 3D models let designers get a 'feel' for the design [1] and establish how the product will look, function, and perform much better than drawings [1] • 3D CAD model could allow client to use VR to inspect design [1] and to test appropriateness of materials/colours/features. [1] • 3D CAD/virtual model does not require materials [1] this will reduce costs during testing Accept all valid responses.	**2**	

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