

## **Cambridge National**

### **Engineering**

#### **R105/01: Engineering Design: Design briefs, design specifications and user requirements**

Level 1/2 Cambridge National Certificate/Award

### **Mark Scheme for January 2024**

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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## MARKING INSTRUCTIONS

### PREPARATION FOR MARKING RM ASSESSOR

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM Assessor Assessor Online Training*; *OCR Essential Guide to Marking*.
2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are posted on the RM Cambridge Assessment Support Portal <http://www.rm.com/support/ca>
3. Log-in to RM Assessor and mark the **required number** of practice responses (“scripts”) and the **number of required** standardisation responses.

YOU MUST MARK 10 PRACTICE AND 10 STANDARDISATION RESPONSES BEFORE YOU CAN BE APPROVED TO MARK LIVE SCRIPTS.

### MARKING

1. Mark strictly to the mark scheme.
2. Marks awarded must relate directly to the marking criteria.
3. The schedule of dates is very important. It is essential that you meet the RM Assessor 50% and 100% (traditional 40% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.
4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone or the RM Assessor messaging system, or by email.

## 5. Crossed Out Responses

Where a candidate has crossed out a response and provided a clear alternative then the crossed out response is not marked.

Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed out response where legible.

## Rubric Error Responses – Optional Questions

Where candidates have a choice of question across a whole paper or a whole section and have provided more answers than required, then all responses are marked and the highest mark allowable within the rubric is given. Enter a mark for each question answered into RM assessor, which will select the highest mark from those awarded. *(The underlying assumption is that the candidate has penalised themselves by attempting more questions than necessary in the time allowed.)*

## Multiple Choice Question Responses

When a multiple choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate). *When a question requires candidates to select more than one option/multiple options, then local marking arrangements need to ensure consistency of approach.*

## Contradictory Responses

When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

## Short Answer Questions (requiring only a list by way of a response, usually worth only **one mark per response**)

Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. *(The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.)*

## Short Answer Questions (requiring a more developed response, worth **two or more marks**)

If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on a similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space.)

**Longer Answer Questions** (requiring a developed response)

Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional judgement as to whether the second (or a subsequent) response is a 'new start' or simply a poorly expressed continuation of the first response.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there, then add a tick to confirm that the work has been seen.
7. Award No Response (NR) if:
  - there is nothing written in the answer space



Award Zero '0' if:

- anything is written in the answer space and is not worthy of credit (this includes text and symbols).

Team Leaders must confirm the correct use of the NR button with their markers before live marking commences and should check this when reviewing scripts.

8. The RM Assessor **comments box** is used by your team leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**  
If you have any questions or comments for your team leader, use the phone, the RM Assessor messaging system, or e-mail.
9. *Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.*

10. Only these annotations, (including abbreviations), used in RMassessor3 for marking this examination must be used when marking R105/01.

Annotation	Meaning of annotation
<b>BP</b>	Blank page
<b>VG</b>	Vague
	Tick
<b>SEEN</b>	Incorrect, Noted but no credit given
	Unclear – cannot read
<b>REP</b>	Repeat
<b>BOD</b>	Benefit of doubt
<b>Annotations to be used for Question 4b* only are below (note NO <b>Ticks</b> are used on this question part).</b>	
<b>K</b>	Knowledge
<b>DEV</b>	Development – Developed Knowledge <b>K</b> point
<b>L1</b>	Level 1 - See mark scheme pages 14-15 for Level descriptions
<b>L2</b>	Level 2 - See mark scheme pages 14-15 for Level descriptions
<b>L3</b>	Level 3 - See mark scheme pages 14-15 for Level descriptions

For additional extra pages to the exam booklet, use **BP** where the page is completely blank (extra pages only)

### 11. Subject Specific Marking Instructions – R105/01

Mark all questions using the **tick** when answer is correct, **BOD** (benefit of doubt) may be awarded on some occasions accompanied by the **tick**. Incorrect answers or those not worthy of the mark use **SEEN**. **You must not use X**

Where no answer / work is presented and left blank, use **SEEN** to shown that the answer has been seen, and entre **NR** (No Response). **Do not use 0** if there is no attempted answer.

**Q4c\*** the candidate is expected to discuss knowledge of the question. When knowledge points are valid this should be shown by inserting a K above the written text. If the knowledge point is explained/justified then **DEV** (development of point) should be added above the written text. Once the candidates answer has been read it should be awarded a level for the response according to the descriptors in the body of this mark scheme which should be indicated as **L1**, **L2**, **L3** with an appropriate mark awarded.

Question			Answer/Indicative content	Mark	Guidance										
1	(a)	(i)	<p>One mark awarded for each correct answer</p> <p>Suitable product requirements for the speaker, e.g.:</p> <ul style="list-style-type: none"><li>• Adjustable volume / volume control (1)</li><li>• Adjustable treble / bass/tone controls (1)</li><li>• Can be heard from a distance e.g., 6m away</li><li>• Bluetooth / pairing capability (1)</li><li>• Wireless remote control (1)</li><li>• LED party light function (1)</li><li>• Works with smart devices (1)</li><li>• Waterproof / showerproof (1)</li></ul> <p>(2x1)</p>	2	Award other valid answers that relate to sustainable design and product maintenance / performance.										
	(a)	(ii)	<table border="1"><thead><tr><th>Term</th><th>Tick (✓)</th></tr></thead><tbody><tr><td>Comfort</td><td></td></tr><tr><td>Scale</td><td></td></tr><tr><td>Surface finish</td><td>✓</td></tr><tr><td>Tolerance</td><td></td></tr></tbody></table> <p>(1x1)</p>	Term	Tick (✓)	Comfort		Scale		Surface finish	✓	Tolerance		1	This is the only correct answer.
Term	Tick (✓)														
Comfort															
Scale															
Surface finish	✓														
Tolerance															



Question			Answer/Indicative content	Mark	Guidance
	(a)	(iii)	<p>Award up to 2 marks for a valid description e.g.</p> <ul style="list-style-type: none"> <li>The brief could specify a specific shape (1) possible because of new processes such as 3D printing. (1)</li> <li>New production processes may influence the materials stated within the brief (1) or the shape of the product within the brief. (1)</li> <li>Layering composites such as carbon fibre could be (1) used to give the speaker a unique shape and texture. (1)</li> <li>Polymers (1) suitable for additive manufacturing / 3D printing (1) could be used so moulds do not have to be made. (1)</li> <li>Polymers / PVC (1) could be used to make the speaker casing by extruding. (1)</li> </ul> <p>(2x1)</p>	2	<p>Award other valid answers.</p> <p>Award 1 mark for a suitable specific material or material type, or aesthetic change (shape, texture, finish / colours).</p> <p>Award one mark for a new (specific) production process.</p>
	(b)	(i)	<p>One mark for each correct standard component type e.g.:</p> <ul style="list-style-type: none"> <li>Knock down fittings (1)</li> <li>Nuts and bolts (1)</li> <li>Screws / fixings (1)</li> <li>Tacks / nails (1)</li> <li>Washers (1)</li> <li>Biscuits (1)</li> <li>Dowels (1)</li> <li>Terminal connectors (1)</li> </ul> <p>(2x1)</p>	2	<p>Award other valid answers.</p> <p>Award recognised fasteners / fixings, i.e., pop rivets etc.</p>

Question			Answer/Indicative content	Mark	Guidance
	(b)	(ii)	<p>Award up to three marks for a valid description e.g.:</p> <p>The design of the furniture should follow current fashion trends (1) therefore the shape and form (1) should appeal to a wide audience. (1)</p> <p>People want to buy furniture that appeals to them (1) and has a look that fits in with the surroundings (1) responding to changing customer trends. (1)</p> <p>Consumers are more likely to purchase on-trend designs (1) with an appealing shape and texture (1) increasing sales and the success of the product. (1)</p> <p>Consumers expect furniture to look good (1) so the range of colours (1) and shape matter. (1)</p> <p>To produce a design that stands out compared to competitors' products (1) using improved materials (1) which can increase sales. (1)</p> <p>(3x1)</p>	3	Award other valid answers.
			<b>Total</b>	<b>[10]</b>	

Question			Answer/Indicative content	Mark	Guidance
2	(a)	(i)	<p>Award up to two marks for a valid description e.g.</p> <p>The handle of the iron is easy to hold (1) and ergonomically suitable for a wide range of users. (1)</p> <p>The handle has been designed so that it is comfortable to hold and use (1) without straining the wrist. (1)</p> <p>The handle is easy to grip (1) and the controls are easy to reach with the hand. (1)</p> <p>(2x1)</p>	2	Award other valid answers.

	<b>(a)</b>	<b>(ii)</b>	<p>Award up to three marks for a valid description e.g.:</p> <p>The iron is made from high impact polymer (1) so if it drops it does not break open (1) and expose electrical components that would be dangerous. (1)</p> <p>The handle is far away from the hot surface (1) reducing risk of touching hot parts (1) or hot steam / spray. (1)</p> <p>The iron is balanced when standing up (1) so that it does not fall on the user's hand (1) or fall off on the user's feet. (1)</p> <p>The iron has a long electrical lead (1) so the wire is not strained (1) leading to loose or frayed wires. (1)</p> <p>(3x1)</p>	<b>3</b>	<p>Award other valid answers.</p> <p>Award one mark for the example, and up to two marks for a justified response.</p> <p>Answers must include a valid example and justification for full marks.</p>
	<b>(a)</b>	<b>(iii)</b>	<p>Award one mark for a valid answer i.e.:</p> <ul style="list-style-type: none"> <li>the impact of extraction on the environment (1)</li> <li>the impact of extraction on resource depletion (1)</li> <li>the amount of energy used during extraction (1)</li> <li>transport from the place of extraction to processing (1)</li> <li>harmful emissions / CO<sub>2</sub> caused by extraction (1)</li> <li>waste caused by of extracted materials (1)</li> <li>if the resource is recyclable to reduce extraction (1)</li> </ul> <p>(1x1)</p>	<b>1</b>	Award other valid answers.
	<b>(a)</b>	<b>(iv)</b>	<p>Award one mark for each correct answer e.g.:</p> <ul style="list-style-type: none"> <li>the energy source used to power the product (1)</li> <li>does the product use batteries that are disposed of (1)</li> <li>energy consumption / efficiency during use (1)</li> <li>harmful emissions / waste in use (1)</li> <li>Can the product be maintained (1) repaired (1) to prolong use. (1)</li> </ul> <p>(2x1)</p>	<b>2</b>	<p>Award other valid answers.</p> <p>Answers must relate to the product in use, and not disposal.</p>

	<b>(b)</b>		<p>Award up to two marks for a valid explanation e.g.;</p> <ul style="list-style-type: none"> <li>• Bioplastics are made from natural resources such as corn starch (1) and therefore biodegrade quickly (1) reducing space required for landfill. (1)</li> <li>• Bioplastics are biodegradable (1) made from vegetables so that do not harm the environment when sent to landfill. (1)</li> <li>• Bioplastics decompose quickly (1) so are not in the landfill for very long. (1)</li> <li>• Can be used as a biomass source (1), and not be sent to landfill. (1)</li> </ul> <p>(2x1)</p>	<b>2</b>	<p>Award other valid answers.</p> <p>Award 1 mark for understanding of what a bioplastic is.</p>
			<b>Total</b>	<b>[10]</b>	

<b>Question</b>			<b>Answer/Indicative content</b>	<b>Mark</b>	
<b>3</b>	<b>(a)</b>	<b>(i)</b>	<p>Award one mark for a valid answer i.e.:</p> <ul style="list-style-type: none"> <li>• Aesthetics</li> <li>• Budget (1)</li> <li>• Essential and desirable aspects (must have, must do) (1)</li> <li>• Timescale (1)</li> </ul> <p>(1x1)</p>	<b>1</b>	Accept any other valid point.

		<b>(ii)</b>	<p>Award up to two marks for a valid description e.g.:</p> <p>Corporate branding can make product instantly recognisable, (1) increasing demand. (1)</p> <p>Consumers recognise logos (1) and like to own branded products. (1)</p> <p>Football clubs use corporate branding to increase sales of merchandise (1) drawing on a wide audience. (1)</p> <p>Celebrity endorsement with a brand can increase popularity of the brand and product(s) (1) leading to higher sales. (1)</p> <p>Using household names on products provides an endorsement of quality (1) which consumers trust. (1)</p> <p>Consumers recognise the brand and trust their products. (1)</p> <p style="text-align: right;">(2x1)</p>	<b>2</b>	
	<b>(a)</b>	<b>(iii)</b>	<p>Award one mark for a correct smart material i.e.:</p> <ul style="list-style-type: none"> <li>• Photochromic material (1)</li> <li>• Shape memory alloys (1)</li> <li>• Thermochromic pigment (1)</li> </ul> <p style="text-align: right;">(1x1)</p>	<b>1</b>	<p>Award other valid answers.</p> <p>.</p>

	<b>(a)</b>	<b>(iv)</b>	<p>Award two marks for a correct explanation covering the following points, e.g.:</p> <ul style="list-style-type: none"> <li>• To manage cost of manufacturing, stay in budget (1)</li> <li>• To reduce cost of manufacturing (1)</li> <li>• To manufacture as sustainable products / sustainability (1)</li> <li>• Sustainable design will increase sales / product success. (1)</li> </ul> <p>(2x1)</p>	<b>2</b>	Award other valid examples.
	<b>(b)</b>		<p>Award one mark for a correct answer e.g.:</p> <p>3D printing could be used to make a prototype to test:</p> <ul style="list-style-type: none"> <li>• the shape of the design (1)</li> <li>• the ergonomics (1)</li> <li>• the size/s (1)</li> <li>• comfort / fit (1)</li> </ul> <p>(1x1)</p>	<b>1</b>	Accept any other valid points.
	<b>(c)</b>	<b>(i)</b>	<p>Award one mark for a correct answer e.g.:</p> <ul style="list-style-type: none"> <li>• To efficiently use the product (1)</li> <li>• Reduce energy bill in use (1)</li> <li>• Consumers look for / prefer energy efficient products. (1)</li> <li>• Consumers are more likely to buy an energy efficient product. (1)</li> </ul> <p>(1x1)</p>	<b>1</b>	Award similar answers.

	<b>(c)</b>	<b>(ii)</b>	<p>Award up to two marks for a correct description e.g.:</p> <p>The manufacturing materials / components cannot be altered within the budget (1) and the desired size / functions / features of the refrigerator means it will use more energy. (1)</p> <p>The range of functions required such as an icemaker (1) use more energy, and more storage spaces use more manufacturing materials and processing, reducing efficiency. (1)</p> <p>(2x1)</p>	<b>2</b>	Award other valid examples.
			<b>Total</b>	<b>[10]</b>	

<b>Question</b>			<b>Answer/Indicative content</b>	<b>Mark</b>	
<b>4</b>	<b>(a)</b>	<b>(i)</b>	<p>Award one mark for the correct answer i.e.:</p> <p>Mass production (1)</p> <p>(1x1)</p>	<b>1</b>	Allow 'production in volume' or similar.
	<b>(a)</b>	<b>(ii)</b>	<p>Award up to three marks for a valid description e.g.</p> <p>Ease of manufacture has been considered by making the product out of a few different materials (1). The carton can be folded in a single process (1) and the card can be printed on without using separate labels. (1)</p> <p>Few processes are used to make the carton (1) using only two materials (1) that is made by a machine. (1)</p> <p>The card container and the lid are only two materials (1). The card can be printed and folded (1) and the lid can be bought-in, saving time and labour. (1)</p> <p>(3x1)</p>	<b>3</b>	Award other valid example answers.

Question	Guidance	Mark	Answer/Indicative content Guidance
<p>4</p> <p>(b) *</p>	<p>Award up to six marks for a discussion with examples of how environmental pressures can influence choice of materials for food packaging manufacture.</p> <p><b>Level 3 (5–6 Marks)</b></p> <p>Learners provide a thorough discussion using examples of how environmental pressures can influence choice of materials. They show a clear understanding of the required question material. Specialist language and terms would be used in the appropriate areas being discussed and the required information will be well structured in its presentation.</p> <p>Good examples used to discuss how environmental pressure can influence choice of materials. Learners will demonstrate an accurate level of spelling, punctuation, and grammar.</p> <p><b>Level 2 (3–4 Marks)</b></p> <p>Learners provide an adequate discussion of how environmental pressures can influence choice of materials. Some examples used.</p> <p>Some evidence of the use of specialist language although not always in the appropriate areas being discussed. Information, for the most part, will be reasonably structured but may contain occasional errors in spelling, punctuation, and grammar.</p> <p><b>Level 1 (1–2 Marks)</b></p>	<p>6</p>	<p>Examples and relevant points could include:</p> <ul style="list-style-type: none"> <li>• Most manufacturing causes some pollution in the air or in waterways, or can produce more CO<sub>2</sub>.</li> <li>• Manufacturers are increasingly aware of how environmental pressures influence consumer choice.</li> <li>• Consumers can stop using products packaged in materials that are known to harm the environment.</li> <li>• Consumer needs influence manufactures choice and design, leading to change to more sustainable packaging.</li> <li>• Food packaging has material information and symbols on them, so people are more aware of the materials used.</li> <li>• Consumers often prefer recyclable materials and biodegradable materials which attracts less environmental pressure on material usage.</li> <li>• Materials that need to be extracted such as crude oil from which plastics are made, causes environmental damage and pollution in the sea and air pollution.</li> <li>• The use of bioplastics reduces the impact as they are made from naturally grown and harvested crops, using corn starch.</li> <li>• There is much environmental pressure globally to reduce deforestation from using paper products. Food packaging continually uses increasing amounts of paper packaging, only some of which is made from recycled materials.</li> <li>• Non-recyclable and single use plastics harm the environment and make products less popular.</li> <li>• Environmental groups campaign and add pressure for change.</li> <li>• An example is McDonalds stopped using polystyrene containers and now use card that can be recycled.</li> </ul>



		<p>Learners provide a basic discussion which show some understanding of how environmental pressures can influence choice of materials but use little or no specialist language.</p> <p>Few or no examples used to show understanding of environmental pressures. Answers may be ambiguous or disjointed. Contains obvious errors in spelling, punctuation, and grammar.</p> <p>0 marks = no response or no response worthy of credit. Annotate as 'Seen' at end of the response.</p>		<ul style="list-style-type: none"> <li>• However plastic films used in food packaging is not recyclable but many food products such as snacks and biscuits usually use single use plastic film packaging.</li> <li>• Manufacturers have a key role to make packaging more sustainable reduce waste and landfill to respond to consumer and environmental pressure to reduce landfill sites.</li> <li>• Manufacturers and retailers are encouraging reuse of plastic cups.</li> </ul> <p>Look out of for key terms and references related to extraction, deforestation, landfill, single use plastics, bioplastics.</p>
		<b>Total</b>	<b>[10]</b>	

Question			Answer/Indicative content	Mark	Guidance
5	(a)	(i)	<p>Award one mark for a correct answer.</p> <ul style="list-style-type: none"> <li>• Disposal information (1)</li> <li>• Recycling information (1)</li> <li>• Material type (1)</li> </ul> <p>(1x1)</p>	1	
	(a)	(ii)	<p>Award one mark for a valid response i.e.:</p> <ul style="list-style-type: none"> <li>• It keeps the product fresh. (1)</li> <li>• You can see what the product is on the shelf / what is inside the packaging / how many are in the packing (1)</li> <li>• Stickers / labels added to the packaging show product information. (1)</li> <li>• Removable card sleeve that slides over the container can be added to show product information and keep the container closed. (1)</li> <li>• Protects the product. (1)</li> </ul> <p>(2x1)</p>	2	

	<b>(a)</b>	<b>(iii)</b>	<p>Award up to three marks for a description e.g.:</p> <p>The design of the packaging allows the product to be made in one process / moulding (1) from a single material (1) reducing materials requirements. (1)</p> <p>Mass production can be used (1) with the same mould (1) to make the same product repeatably (1) in a single process. (1)</p> <p>Mass production using only one piece (1) makes production time efficient (1) and can be automated. (1)</p> <p>Many of the same product can be made quickly (1) saving human labour (1) All products are the exactly same / the same quality / accuracy. (1)</p> <p>Curved design to allow easy removal from the mould (1) One piece design that folds. (1)</p> <p>(3x1)</p>	<b>3</b>	<p>Allow similar answers. Award as mark for references to:</p> <ul style="list-style-type: none"> <li>• Repeatability</li> <li>• Consistency / quality</li> <li>• Scale of production</li> <li>• Automation / labour saving.</li> </ul>
	<b>(a)</b>	<b>(iv)</b>	<p>Award one mark for a correct answer e.g.:</p> <ul style="list-style-type: none"> <li>• Make it from a recyclable material (1)</li> <li>• Make it out of a bioplastic (1)</li> <li>• Make it biodegradable (1)</li> <li>• Make it reusable (1)</li> <li>• Reduce the size / remove unnecessary material (1)</li> <li>• Use less / thinner material (1)</li> </ul> <p>(1x1)</p>	<b>1</b>	

	<b>(b)</b>	<p>Award up to three marks for a correct explanation i.e.:</p> <p>Resource depletion is when resources are used up faster than they can be replaced. (1) An example is deforestation (1) when trees are cut down before new ones can be grown to a usable size. (1)</p> <p>Coal is a fossil fuel that is mined (1) and is being used up in large amounts quickly (1) and cannot be replaced. (1)</p> <p>As natural resources are used up, such as gas (1), they will become scarce (1) and the price will rise because gas is more difficult or more expensive to obtain (1).</p> <p>Use of hardwoods (1) which take a long time to grow back (1) and can only be grown in certain parts of the world. (1)</p> <p>(3x1)</p>	<b>3</b>	Accept other valid explanations, and where a named type of fossil fuel is given.
		<b>Total</b>	<b>[10]</b>	

<b>Question</b>			<b>Answer/Indicative content</b>	<b>Mark</b>	<b>Guidance</b>
<b>6</b>	<b>(a)</b>	<b>(i)</b>	<p>Award one mark for the correct answer i.e.:</p> <p>Design phase (1)</p> <p>(1x1)</p>	<b>1</b>	Only correct answer.

	<b>(a)</b>	<b>(ii)</b>	<p>Award up to three marks for a correct explanation i.e.:</p> <p>The tolerance sets the minimum and maximum dimensions of the part. (1)</p> <p>If the tolerance is too great, the struct could be too stiff or too loose. (1)</p> <p>The tolerance allows some movement to reduce friction / binding. (1)</p> <p>If the strut is too loose the tailgate could fall on the user. (1)</p> <p>The tolerance is important to maintain the quality of the part. (1)</p> <p>The tolerance allows the tailgate to operate smoothly (1). If the tolerance is out, the strut will not work properly. (1)</p> <p>The strut needs to hold the weight of the tailgate open (1). If the tolerance is out, the door will not be held open properly (1) and the strut could bend if too loose or too tight. (1)</p> <p>(3x1)</p>	<b>3</b>	
	<b>(a)</b>	<b>(iii)</b>	<p>Award one mark for a correct answer i.e.:</p> <ul style="list-style-type: none"> <li>• Materials (1)</li> <li>• Scale (1)</li> <li>• Projection (1)</li> <li>• Drawing number / reference / name (1)</li> </ul> <p>(1x1)</p>	<b>1</b>	

	<b>(b)</b>	<p>Award up to two marks for a valid description e.g.:</p> <p>Intellectual property means it belongs to someone or a company (1) who owns the design. (1)</p> <p>Intellectual property is something created by a company (1) such as an invention, trademark, or design / symbol. (1)</p> <p>The design or patent is owned by the company (1) and no one else can use the design without the owner's permission. (1)</p> <p>Intellectual property includes the copyright, patents and trademarks, registered design. (1)</p> <p>No one else can steal / copy the design. (1)</p> <p style="text-align: right;">(2x1)</p>	<b>2</b>	Award 1 mark for an example of intellectual property applied to a product.
	<b>(c)</b>	Award up to three marks for a valid explanation e.g.	<b>3</b>	Award a mark for a specific example of maintenance Do not award a repeat of the question stem.

			<ul style="list-style-type: none"> <li>• Maintenance allows the product to continue to work properly / to its optimum (1) and therefore, last longer in service (1) meaning it does not have to be thrown away. (1)</li> <li>• If the product is not serviced / maintained, it will fail (1) and a new product or parts will be needed; more new products will need to be made (1) adding to material usage and waste. (1)</li> <li>• If the product is serviced / maintained, it will last longer, making it more sustainable, (1) and need replacing less often (1). This reduces the amount of materials and resources used to make new products. (1)</li> <li>• To make sure the product keeps working. (1)</li> </ul> <p style="text-align: right;">(3x1)</p>		
			<b>Total</b>	<b>[10]</b>	

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