



A-level
**DESIGN AND TECHNOLOGY:
PRODUCT DESIGN
7552/1**

Paper 1 Technical Principles

Mark scheme

June 2022

Version: 1.0 Final



2 2 6 A 7 5 5 2 / 1 / M S

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from aqa.org.uk

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Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Glossary for maths

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.


[a, b]	Accept values between a and b inclusive.
For π	Accept values in the range [3.14, 3.142]
Their	Accept an answer from the candidate if it has been inaccurately calculated but is subsequently used in a further stage of the question.

Questions which do not ask students to show working

As a general principle, a correct response is awarded full marks.

Qu	Part	Marking Guidance	Total marks	AO
01		<p>State three reasons why Precious Metal Clay (PMC) may be used in the manufacture of a decorative pendant for a necklace.</p> <p>One mark per relevant point.</p> <p>Indicative content</p> <p>PMC:</p> <ul style="list-style-type: none"> • is malleable and easy to mould and shape into an appropriate form • has an attractive aesthetic appearance • can be polished once fired • is less expensive than using a traditional metal such as gold and silver • it is able to be hallmarked to provide authenticity • will set to become hard and durable when fired. <p>This list is not exhaustive. Accept any other valid responses.</p>	3 marks	AO4 1a

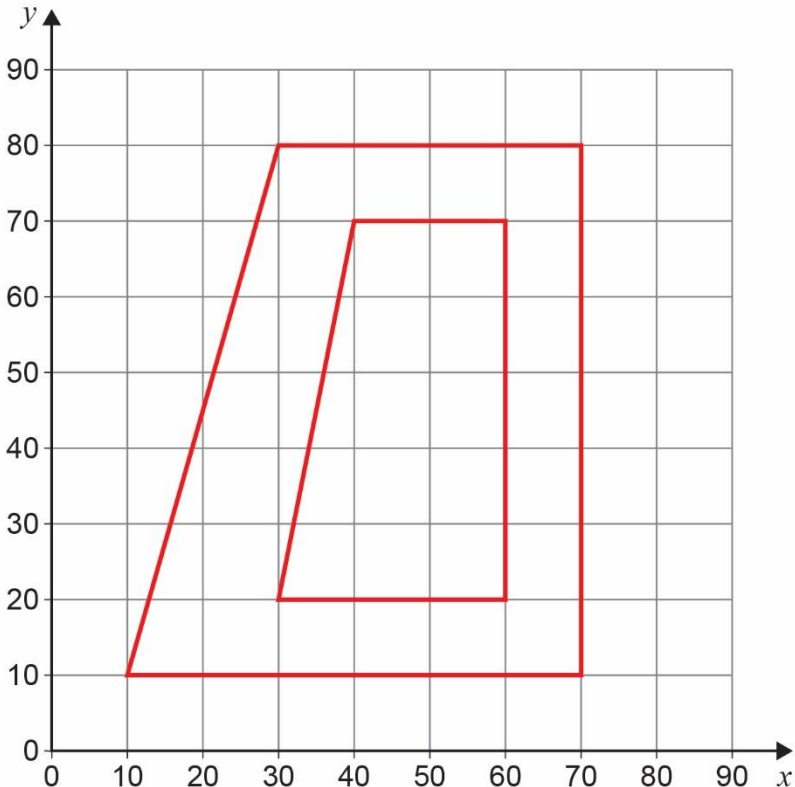
Qu	Part	Marking Guidance	Total marks	AO												
02		<p>A purple component is to be produced using a pigmented resin.</p> <p>Use the data to calculate the maximum number of these components that could be produced.</p> <p>You may assume unlimited supplies of clear resin and magenta pigment.</p> <table border="1" data-bbox="437 589 1102 660"> <tr> <td>Cyan pigment available</td> <td>10 ml</td> </tr> <tr> <td>Single component volume</td> <td>5965 mm³</td> </tr> </table> <table border="1" data-bbox="368 692 1168 831"> <tr> <td></td> <td>Clear Resin</td> <td>Cyan Pigment</td> <td>Magenta Pigment</td> </tr> <tr> <td>Ratios for Purple Resin</td> <td>80</td> <td>4</td> <td>1</td> </tr> </table> <p>Establishing the volume of either the resin or pigment = 2.5 ml Magenta or 1 mark (M1) = 200 ml Clear resin</p> <p>Calculating the total volume 200 ml + 10 ml + 2.5 ml 1 mark (A1) = 212.5 ml</p> <p>Calculating the volume of one component 5965 mm³ 1 mark (M1) = 5.965 cm³</p> <p>= 5.965 ml</p> <p>Calculating the total number of components that could be produced $\frac{(\text{their } 212.5)}{(\text{their } 5.965)} = 35.6$ 1 mark (A1) = 35 components or (their answer rounded down) components or</p> <p>212.5 ml = 212 500 mm³</p> <p>$\frac{(\text{their } 212\ 500)}{5965}$</p> <p>= (their 35.62)</p> <p>= (their answer rounded down) components</p> <p>Components Produced = 35 components 4 marks Where no working has been shown but final answer is accurate</p>	Cyan pigment available	10 ml	Single component volume	5965 mm ³		Clear Resin	Cyan Pigment	Magenta Pigment	Ratios for Purple Resin	80	4	1	4 marks	AO4 1c
Cyan pigment available	10 ml															
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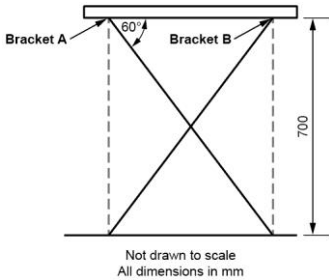
Qu	Part	Marking Guidance	Total marks	AO										
03		<p>Figure 1 shows a low carbon steel shopping basket with a chrome plated finish.</p> <p style="text-align: center;">Figure 1</p>  <p>Analyse and evaluate the suitability of the material and finish used for the shopping basket.</p> <table border="1" data-bbox="320 817 1214 1373"> <thead> <tr> <th>Marks</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>5–6 marks</td> <td>The response clearly shows detailed analysis and evaluation of how the properties of the material and the chosen finish affect the function and suitability of use of the shopping basket.</td> </tr> <tr> <td>3–4 marks</td> <td>The response shows good evaluation and analysis of the suitability of the chosen material and chosen finish of the shopping basket with appropriate reference to its intended function.</td> </tr> <tr> <td>1–2 marks</td> <td>Basic evaluation of the suitability of the chosen material and chosen finish of the shopping basket, but the response tends to be descriptive rather than evaluative or focuses only on either the material or finish.</td> </tr> <tr> <td>0 marks</td> <td>No response or nothing worthy of credit.</td> </tr> </tbody> </table> <p>Indicative content</p> <p>Low Carbon Steel:</p> <ul style="list-style-type: none"> • can be easily drawn into the thin round wire needed to construct the shopping basket • a malleable material that allows for component parts to be cold formed into shape without fracture • can be easily joined by spot welding • a lightweight material that enables the user to carry the basket comfortably • a tough material that will withstand the wear and tear of daily use • a stiff material that allows the basket to maintain its formed shape and withstand the weight of heavy shopping. <p>Chrome Plated finish:</p> <ul style="list-style-type: none"> • the electroplating process ensures an even coating of the intricate structure of the shopping basket • provides a corrosion resistant finish which protects the steel frame while maintaining the aesthetics of the basket 	Marks	Description	5–6 marks	The response clearly shows detailed analysis and evaluation of how the properties of the material and the chosen finish affect the function and suitability of use of the shopping basket.	3–4 marks	The response shows good evaluation and analysis of the suitability of the chosen material and chosen finish of the shopping basket with appropriate reference to its intended function.	1–2 marks	Basic evaluation of the suitability of the chosen material and chosen finish of the shopping basket, but the response tends to be descriptive rather than evaluative or focuses only on either the material or finish.	0 marks	No response or nothing worthy of credit.	6 marks	AO3 2a AO3 2b
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0 marks	No response or nothing worthy of credit.													

		<ul style="list-style-type: none">• provides a hard and durable finish that will withstand scratching when the baskets are stacked for storage• the finish allows the baskets to be cleaned in order to remain hygienic for the carrying of loose food products• the plating process can prevent the repair of the baskets if a weld should fail. <p>This list is not exhaustive. Accept any other valid responses.</p>		
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Qu	Part	Marking Guidance	Total marks	AO										
04		<p>Explain how rapid prototyping has impacted on traditional manufacture.</p> <table border="1" data-bbox="320 439 1214 976"> <thead> <tr> <th data-bbox="320 439 453 495">Marks</th> <th data-bbox="453 439 1214 495">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="320 495 453 651">7–9 marks</td> <td data-bbox="453 495 1214 651">A detailed and thorough understanding of how rapid prototyping has impacted on traditional manufacture. The response clearly identifies the impact that rapid prototyping has had on manufacture.</td> </tr> <tr> <td data-bbox="320 651 453 797">4–6 marks</td> <td data-bbox="453 651 1214 797">The response demonstrates a good understanding of how rapid prototyping has impacted on traditional manufacture. Some relevant points relating to the impact on traditional manufacture are provided.</td> </tr> <tr> <td data-bbox="320 797 453 920">1–3 marks</td> <td data-bbox="453 797 1214 920">The response offers a basic understanding of the benefits of rapid prototyping with limited reference to the impact on traditional manufacture.</td> </tr> <tr> <td data-bbox="320 920 453 976">0 marks</td> <td data-bbox="453 920 1214 976">No response or nothing worthy of credit.</td> </tr> </tbody> </table> <p>Indicative Content</p> <ul data-bbox="320 1081 1214 2040" style="list-style-type: none"> • Rapid prototyping has allowed companies the ability to develop and produce fully functioning prototypes without a huge financial investment in the manufacture of moulds or ancillary components. • It has allowed for the design and manufacture of complex components that would have been prohibitive to manufacture traditionally. • Rapid prototyping has removed the need for highly skilled manufacturers and tool makers as complex designs can be easily achieved without tooling. • Traditional labour intensive manufacturing processes have been replaced by 3D printing that can run without supervision for extended periods of time without breaks or loss of concentration. • A change in focus of manufacturers primary ability to work with physical materials to being competent to work in the field of CAD/CAM. • A huge reduction in the lead time taken to design, produce, develop and test a physical product. • The ability of a manufacturer to now perform many different techniques without the need to subcontract individual component parts out to specialist manufacturers. • A reduction in the need for large industrial spaces and the investment in materials and machinery. • The ability to create components from an ever-developing catalogue of material substrates. • Rapid prototyping can be undertaken using a variety of substrates or materials. • The move away from manufacturers designing components around stock forms and sizes of material. 	Marks	Description	7–9 marks	A detailed and thorough understanding of how rapid prototyping has impacted on traditional manufacture. The response clearly identifies the impact that rapid prototyping has had on manufacture.	4–6 marks	The response demonstrates a good understanding of how rapid prototyping has impacted on traditional manufacture. Some relevant points relating to the impact on traditional manufacture are provided.	1–3 marks	The response offers a basic understanding of the benefits of rapid prototyping with limited reference to the impact on traditional manufacture.	0 marks	No response or nothing worthy of credit.	9 marks	AO4 1b
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		This list is not exhaustive. Accept any other valid responses.		
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Qu	Part	Marking Guidance	Total marks	AO												
05	1	<p>Table 1 shows a series of coordinates used by a laser cutter to produce a component.</p> <p>The external and internal cutting paths are shown.</p> <p style="text-align: center;">Table 1</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>External Path</th> <th>Internal Path</th> </tr> </thead> <tbody> <tr> <td>(10,10)</td> <td>(30,20)</td> </tr> <tr> <td>(70,10)</td> <td>(60,20)</td> </tr> <tr> <td>(70,80)</td> <td>(60,70)</td> </tr> <tr> <td>(30,80)</td> <td>(40,70)</td> </tr> <tr> <td>(10,10)</td> <td>(30,20)</td> </tr> </tbody> </table> <p>Plot the external and internal paths on the grid below.</p>  <p>Plot coordinates correctly See image above 1 mark (A1)</p> <p>Note : Award 1 mark for correct points with no path.</p>	External Path	Internal Path	(10,10)	(30,20)	(70,10)	(60,20)	(70,80)	(60,70)	(30,80)	(40,70)	(10,10)	(30,20)	1 mark	AO4 1c
External Path	Internal Path															
(10,10)	(30,20)															
(70,10)	(60,20)															
(70,80)	(60,70)															
(30,80)	(40,70)															
(10,10)	(30,20)															

Qu	Part	Marking Guidance	Total marks	AO
06		<p>Figure 3 shows the current dimensions of a school desk.</p> <p>If all existing components are used, calculate how much closer together Bracket A and Bracket B would be at a new desk height of 720 mm.</p> <p>Assume that when fully extended the end of each leg is vertically in line with the bracket on the underside of the desk.</p> <p style="text-align: center;">Figure 3</p>  <p style="text-align: center;">Not drawn to scale All dimensions in mm</p> <p>Calculate leg length (x) $\sin 60 = \frac{700}{x}$ 1 mark (M1)</p> <p>(rearranged to)</p> <p>$x = \frac{700}{\sin 60}$ 1 mark (A1)</p> <p>= 808.29</p> <p>Calculate the width between brackets with desk at new height (y) $y^2 + 720^2 = (\text{their } 808.29)^2$ 1 mark (M1)</p> <p>(rearranged to)</p> <p>$y = \sqrt{(\text{their } 808.29)^2 - 720^2}$ 1 mark (A1)</p> <p>= 367.33</p> <p>Calculate the Original Width (z) $\tan 60 = \frac{700}{z}$ 1 mark (M1)</p> <p>(rearranged to)</p> <p>$z = \frac{700}{\tan 60}$ 1 mark (A1)</p> <p>= 404.14</p>	7 marks	AO4 1c

		<p>Distance ‘Bracket A’ and ‘Bracket B’ are closer by</p>	<p>Original Width – New Width $= 404.14 - 367.33$ $= [36.5, 37] \text{ mm}$</p>	<p>1 mark (A1)</p>		
		<p>Distance ‘Bracket A’ and ‘Bracket B’ are closer by Where no working has been shown but final answer is accurate</p> <p>Note to markers :</p> <ul style="list-style-type: none"> • The order of the calculations may not follow that given in the mark scheme. • Be aware of rounding taking place throughout the question. 	<p>$= [36.5, 37] \text{ mm}$</p>	<p>7 marks</p>		


Qu	Part	Marking Guidance	Total marks	AO										
07		<p>Explain why galvanising is an appropriate finish for the low carbon steel scaffold shown in Figure 4.</p> <p style="text-align: center;">Figure 4</p>  <table border="1" data-bbox="331 689 1219 1261"> <thead> <tr> <th data-bbox="336 696 469 734">Marks</th> <th data-bbox="474 696 1214 734">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="336 741 469 920">5–6 marks</td> <td data-bbox="474 741 1214 920">The response demonstrates a detailed and thorough understanding of why galvanising is an appropriate finish for the scaffold frame with reference to how performance characteristics make it appropriate for the scaffold frame application.</td> </tr> <tr> <td data-bbox="336 927 469 1106">3–4 marks</td> <td data-bbox="474 927 1214 1106">The response demonstrates a good understanding of why galvanising is an appropriate finish for the scaffold frame with some reference to how performance characteristics of the finish relate to the scaffold frame application.</td> </tr> <tr> <td data-bbox="336 1113 469 1214">1–2 marks</td> <td data-bbox="474 1113 1214 1214">The response offers a basic explanation of the benefits of galvanising with limited reference to the scaffold frame application.</td> </tr> <tr> <td data-bbox="336 1220 469 1254">0 marks</td> <td data-bbox="474 1220 1214 1254">No response or nothing worthy of credit.</td> </tr> </tbody> </table> <p>Indicative content</p> <ul style="list-style-type: none"> • The scaffold is a functional object, where aesthetics are not as important as function therefore the inconsistent galvanised patterned finish causes no issue. • Galvanising protects the low carbon steel from corrosion. • The galvanising process is hardwearing so will resist the scratching likely to occur from assembly, storage and transportation. • The cathodic protective nature of galvanising means that the scaffold would continue to be protected even if damage did occur. • The dip coating nature of galvanising means that the hollow steel structure of the scaffold is protected on all surfaces. • Galvanising provides a zinc protective layer to the low carbon steel which provides cathodic protection for the base metal. • Galvanising provides a surface finish that requires little or no maintenance allowing for extend use and reducing any ongoing costs to the scaffold user. <p>This list is not exhaustive. Accept any other valid responses.</p>	Marks	Description	5–6 marks	The response demonstrates a detailed and thorough understanding of why galvanising is an appropriate finish for the scaffold frame with reference to how performance characteristics make it appropriate for the scaffold frame application.	3–4 marks	The response demonstrates a good understanding of why galvanising is an appropriate finish for the scaffold frame with some reference to how performance characteristics of the finish relate to the scaffold frame application.	1–2 marks	The response offers a basic explanation of the benefits of galvanising with limited reference to the scaffold frame application.	0 marks	No response or nothing worthy of credit.	6 marks	AO4 1c
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Qu	Part	Marking Guidance	Total marks	AO
08		<p>State three different stimuli that can cause a change in the property of a smart material.</p> <p>One mark per relevant point.</p> <p>Indicative content</p> <p>A change in response to:</p> <ul style="list-style-type: none"> • light • temperature • electricity • pressure. <p>This list is not exhaustive. Accept any other valid responses.</p>	3 marks	AO4 1a

Qu	Part	Marking Guidance	Total marks	AO
09		<p>Name a specific application for each of the following materials: Cellulose acetate Fluted polypropylene Styrofoam</p> <p>One mark per correct application.</p> <p>Indicative content</p> <p>Cellulose acetate:</p> <ul style="list-style-type: none"> • overhead projector (OHP) transparency film • photographic film • transparent film on packaging. • biodegradable cutlery <p>Fluted polypropylene:</p> <ul style="list-style-type: none"> • art portfolio cases • point of sale structures • signage – eg 'For Sale' signs, construction site signs. <p>Styrofoam:</p> <ul style="list-style-type: none"> • aesthetic block models • formers for laminating and moulding • modelling of ergonomic handles. <p>This list is not exhaustive. Accept any other valid responses.</p>	3 marks	AO4 1a


Qu	Part	Marking Guidance	Total marks	AO										
10		<p>Styrofoam and high-density modelling foam are often used in modelling.</p> <p>Compare and evaluate the suitability of each material for the manufacture of a block model that represents aesthetic appearance to a potential client.</p> <table border="1" data-bbox="331 568 1222 1102"> <thead> <tr> <th data-bbox="331 568 472 622">Marks</th> <th data-bbox="472 568 1222 622">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="331 622 472 808">5–6 marks</td> <td data-bbox="472 622 1222 808">The response includes detailed analysis, and compares the two materials in detail with reference to factors such as ease of use and the quality of achievable finish. The response provides detailed evaluation of the suitability of each material to manufacture the block model.</td> </tr> <tr> <td data-bbox="331 808 472 963">3–4 marks</td> <td data-bbox="472 808 1222 963">The response includes good analysis and evaluation of both materials and draws some comparison with reference to factors such as ease of use and the quality of achievable finish.</td> </tr> <tr> <td data-bbox="331 963 472 1048">1–2 marks</td> <td data-bbox="472 963 1222 1048">The response includes basic analysis and tends to be descriptive rather than evaluative.</td> </tr> <tr> <td data-bbox="331 1048 472 1102">0 marks</td> <td data-bbox="472 1048 1222 1102">No response or nothing worthy of credit.</td> </tr> </tbody> </table> <p>Indicative content</p> <p>Styrofoam:</p> <ul data-bbox="331 1240 1222 1720" style="list-style-type: none"> • can be easily shaped with workshop tools such as rasps and surforms, allowing for the rapid manufacture of an aesthetic model • can be sculpted using a hot wire cutter or sculpting bow, creating organic shapes or customised profiles • can tear/shred and rip if shaped with coarse abrasive tools or abrasive paper reducing the quality of the surface finish • the density of the material limits the accuracy in which a hole or recess can be created limiting the complexity of the block model • models can be coloured to represent an aesthetic model, but cellulose paints can melt the surface of the Styrofoam, so often a Polyfilla coating is needed • models can be quickly produced allowing for more regular feedback from a potential client. <p>High-density modelling foam:</p> <ul data-bbox="331 1792 1222 2024" style="list-style-type: none"> • can be shaped with hand tools, but the density of the material limits how effective hand tools can be • can be easily machined using a CNC router or lathe etc, allowing for quick and accurate manufacture from a CAD drawing • the density of the material allows for recesses and holes to be accurately produced so features such as screens and buttons could be easily represented on the block model 	Marks	Description	5–6 marks	The response includes detailed analysis, and compares the two materials in detail with reference to factors such as ease of use and the quality of achievable finish. The response provides detailed evaluation of the suitability of each material to manufacture the block model.	3–4 marks	The response includes good analysis and evaluation of both materials and draws some comparison with reference to factors such as ease of use and the quality of achievable finish.	1–2 marks	The response includes basic analysis and tends to be descriptive rather than evaluative.	0 marks	No response or nothing worthy of credit.	6 marks	AO3 2a AO3 2b
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		<ul style="list-style-type: none">• the density of the material allows the client to have a more realistic idea of the weight of product when interacting with the model• the dense nature of the material means that a high-quality surface finish can be achieved, which can then be filled and sprayed to a standard that could represent the aesthetics of the final product to the client. <p>This list is not exhaustive. Accept any other valid responses.</p>		
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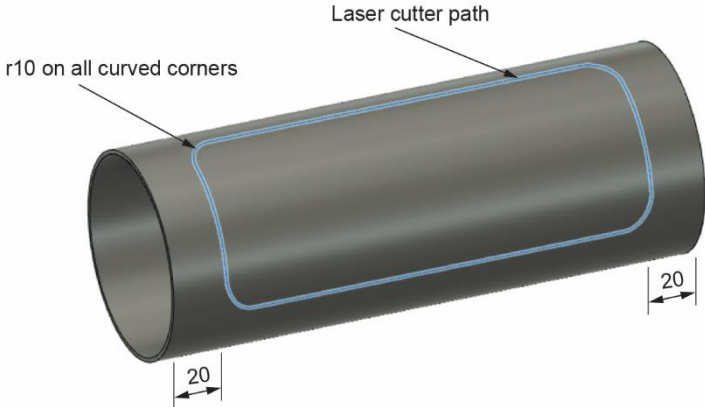
Qu	Part	Marking Guidance	Total marks	AO										
11		<p data-bbox="331 338 1217 405">Explain why die casting is an appropriate manufacturing method for the model toy vehicle shown in Figure 5.</p> <p data-bbox="715 439 834 472" style="text-align: center;">Figure 5</p>  <table border="1" data-bbox="331 741 1217 1245"> <thead> <tr> <th data-bbox="331 741 472 797">Marks</th> <th data-bbox="472 741 1217 797">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="331 797 472 954">5–6 marks</td> <td data-bbox="472 797 1217 954">Detailed understanding of why die casting is used in the manufacture of a model vehicle. Response may refer to the scale of manufacture and the features of the model car.</td> </tr> <tr> <td data-bbox="331 954 472 1111">3–4 marks</td> <td data-bbox="472 954 1217 1111">Good understanding of why die casting is used in the manufacture of a model vehicle. Response may make some reference to the scale of manufacture or the features of the model car.</td> </tr> <tr> <td data-bbox="331 1111 472 1189">1–2 marks</td> <td data-bbox="472 1111 1217 1189">Limited understanding of why die casting is used in the manufacture of a model vehicle.</td> </tr> <tr> <td data-bbox="331 1189 472 1245">0 marks</td> <td data-bbox="472 1189 1217 1245">No response or nothing worthy of credit.</td> </tr> </tbody> </table> <p data-bbox="331 1267 584 1301">Indicative content</p> <ul data-bbox="331 1312 1206 2007" style="list-style-type: none"> • The manufacture of the die casting moulds is both complex and costly making it prohibitive for small scale manufacture. The model vehicle is sold worldwide in large volumes, justifying the use of die casting. • Die casting produces a product with an extremely high-quality surface finish, suitable for representing the body panels on the model vehicle. • The high-quality surface finish then allows for additional surface finishes to be applied without extensive surface preparation. • The die cast moulds are reusable meaning that each model vehicle will be accurately produced to the same design. • Die casting produces a mould with consistent dimensional accuracy which allows for components such as the windows and wheels to be accurately attached. • Pressure die casting is an appropriate process to produce intricate designs such as the model vehicle logo and patterns to represent the doors and windows. • Thin sections or thin wall thicknesses can be achieved which allow features such as the window pillars to be successfully produced. <p data-bbox="331 2018 1198 2051">This list is not exhaustive. Accept any other valid responses.</p>	Marks	Description	5–6 marks	Detailed understanding of why die casting is used in the manufacture of a model vehicle. Response may refer to the scale of manufacture and the features of the model car.	3–4 marks	Good understanding of why die casting is used in the manufacture of a model vehicle. Response may make some reference to the scale of manufacture or the features of the model car.	1–2 marks	Limited understanding of why die casting is used in the manufacture of a model vehicle.	0 marks	No response or nothing worthy of credit.	6 marks	AO4 1c
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Qu	Part	Marking Guidance	Total marks	AO
12		<p>Describe the purpose of the following polymer additives:</p> <ul style="list-style-type: none"> • fillers • plasticisers. <p>One mark for a basic description.</p> <p>Example response ‘Plasticisers make polymers less brittle.’</p> <p>Two marks for a detailed response that clearly describes the purpose of the named polymer additive.</p> <p>Example response ‘Plasticisers can be added to a polymer to reduce its viscosity making it more suitable for use when injection moulding.’</p> <p>A maximum of two marks if only one polymer filler is described.</p> <p>Fillers:</p> <ul style="list-style-type: none"> • can be used to add bulk to a product therefore reducing the amount of raw polymer needed • can be used to reduce the cost of the product, as fillers are generally cheaper than the raw polymer • can be used to improve the performance characteristic of a polymer, such as the tensile strength of nylon being improved by using a glass filler. <p>Plasticisers:</p> <ul style="list-style-type: none"> • can be added to a polymer to improve its plasticity therefore making it less brittle. This allows the polymer product to flex or stretch, eg PVC hose pipe can be easily coiled for storage. • can be added to a polymer to reduce its viscosity therefore improving its ability to flow when in a liquid state, eg a polymer being used in redistribution manufacturing process such as injection moulding. <p>This list is not exhaustive. Accept any other valid responses.</p>	2 x 2 marks	AO4 1a



Qu	Part	Marking Guidance	Total marks	AO
13		<p>Give two reasons why outdoor decking may be pressure treated before use.</p> <p>One mark per correct reason given.</p> <p>Indicative content</p> <ul style="list-style-type: none"> • Outdoor decking will be consistently exposed to the elements so the pressure treating (tanalising) process will protect the timber from weathering increasing its durability and extending its lifespan. • Outdoor timber is prone to fungal decay and insect attack. The preservative used in the tanalising process will protect the timber against both fungal decay and insect attack. • The pressure used in the process forces the preservative into the outer cell layer of the timber providing long lasting protection. This is important as not all surfaces of decking will be accessible for subsequent maintenance. <p>This list is not exhaustive. Accept any other valid responses.</p>	2 marks	AO4 1b

Qu	Part	Marking Guidance	Total marks	AO										
14		<p>A polymer extrusion process has been used to produce the rigid polyvinyl chloride (PVC) cable trunking shown in Figure 6.</p> <p>Describe the main stages of the polymer extrusion process.</p> <p style="text-align: center;">Figure 6</p>  <table border="1" data-bbox="331 831 1225 1391"> <thead> <tr> <th data-bbox="331 831 472 887">Marks</th> <th data-bbox="472 831 1225 887">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="331 887 472 1070">5–6 marks</td> <td data-bbox="472 887 1225 1070">The response shows a detailed knowledge of the process of extrusion moulding with an understanding of all main stages of the process. The response covers in detail the required stages in a logical sequence to produce a successful polymer extrusion.</td> </tr> <tr> <td data-bbox="331 1070 472 1254">3–4 marks</td> <td data-bbox="472 1070 1225 1254">The response shows a good level of knowledge of the process of extrusion moulding. The response describes most of the main stages of the process which if followed would achieve a successful extrusion moulding.</td> </tr> <tr> <td data-bbox="331 1254 472 1339">1–2 marks</td> <td data-bbox="472 1254 1225 1339">The response shows basic understanding of the process of extrusion moulding.</td> </tr> <tr> <td data-bbox="331 1339 472 1391">0 marks</td> <td data-bbox="472 1339 1225 1391">No response or nothing worthy of credit.</td> </tr> </tbody> </table> <p>Indicative content</p> <ul data-bbox="331 1496 1225 1917" style="list-style-type: none"> • Thermoplastic polymers are loaded in to a hopper. • An Archimedean screw moves the polymer through a heated chamber softening the polymer. • The molten polymer is forced through a steel die. • The die would have the appropriate pattern needed for the cable trunking. • The extrusion is then supported by rollers as it leaves the die. • The extrusion is then rapidly cooled by water or air. • The extrusion may also be pulled through the die to keep the extrusion under tension and therefore stop any deformation of the profile. • The extrusion is then cut to the desired length. <p>This list is not exhaustive and not all bullet points are necessary to access full marks. Accept any other valid responses.</p>	Marks	Description	5–6 marks	The response shows a detailed knowledge of the process of extrusion moulding with an understanding of all main stages of the process. The response covers in detail the required stages in a logical sequence to produce a successful polymer extrusion.	3–4 marks	The response shows a good level of knowledge of the process of extrusion moulding. The response describes most of the main stages of the process which if followed would achieve a successful extrusion moulding.	1–2 marks	The response shows basic understanding of the process of extrusion moulding.	0 marks	No response or nothing worthy of credit.	6 marks	AO4 1a
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15		<p>Describe the advantages to a manufacturer of using bought-in components.</p> <table border="1" data-bbox="331 434 1222 869"> <thead> <tr> <th data-bbox="331 434 472 490">Marks</th> <th data-bbox="472 434 1222 490">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="331 490 472 607">5–6 marks</td> <td data-bbox="472 490 1222 607">The response shows a detailed understanding of the advantages to a manufacturer of using bought-in components and the role they play in manufacture.</td> </tr> <tr> <td data-bbox="331 607 472 730">3–4 marks</td> <td data-bbox="472 607 1222 730">The response demonstrates a good understanding of advantages to a manufacturer of using bought-in components.</td> </tr> <tr> <td data-bbox="331 730 472 815">1–2 marks</td> <td data-bbox="472 730 1222 815">The response offers a basic understanding of why bought-in components may be used.</td> </tr> <tr> <td data-bbox="331 815 472 869">0 marks</td> <td data-bbox="472 815 1222 869">No response or nothing worthy of credit.</td> </tr> </tbody> </table> <p>Indicative content</p> <ul style="list-style-type: none"> • They allow the company to make use of specialist manufacturers of a particular component, making financial savings by not having to produce the range of components themselves. • A product manufacturer may not have the expertise or ability to produce all necessary components in house, so it would be necessary for them to use bought-in components from other suppliers and manufacturers. • It allows companies to buy in bulk from a variety of suppliers allowing them to secure the best price and unit cost. • It can speed up the manufacturing process by ensuring that sufficient quantities of the component are available. • It provides manufacturers with the assurance of consistency, meaning that components can be designed around a stock size or form, eg nuts, bolts, rivets etc. • Provides the manufacturer with peace of mind that the components will be of the correct standard as companies will have produced the components in line with ISO 9001. <p>This list is not exhaustive. Accept any other valid responses.</p>	Marks	Description	5–6 marks	The response shows a detailed understanding of the advantages to a manufacturer of using bought-in components and the role they play in manufacture.	3–4 marks	The response demonstrates a good understanding of advantages to a manufacturer of using bought-in components.	1–2 marks	The response offers a basic understanding of why bought-in components may be used.	0 marks	No response or nothing worthy of credit.	6 marks	AO4 1b
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16		<p>Figure 7 shows an acrylic tube that will have a section cut out on a laser cutter.</p> <p>The section to be removed is one quarter of the circumference of the tube.</p> <p style="text-align: center;">Figure 7</p>  <p style="text-align: center;">All dimensions in mm</p> <table border="1" data-bbox="341 1086 1209 1196" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 2px;">Length of Cylinder</td> <td style="padding: 2px;">200 mm</td> </tr> <tr> <td style="padding: 2px;">Diameter of Cylinder</td> <td style="padding: 2px;">75 mm</td> </tr> <tr> <td style="padding: 2px;">Cutting Speed</td> <td style="padding: 2px;">2200 mm per minute</td> </tr> </table> <p>Use the data provided to calculate the time taken to cut the path shown on the acrylic tube.</p> <p>Straight length of rectangular aperture between curved corners</p> $200 - 40 - 20 = 140$ <p style="margin-left: 40px;">$(x = 140)$</p> <p>Length of one curved corner</p> $\frac{1}{4} \times 2\pi r$ $\frac{1}{4} \times 2 \times \pi \times 37.5$ $= [58.87, 58.91]$	Length of Cylinder	200 mm	Diameter of Cylinder	75 mm	Cutting Speed	2200 mm per minute	6 marks	AO4 1c
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Diameter of Cylinder	75 mm									
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		<p>Curved edge with allowance for the radiused corners</p> <p>= their [58.87, 58.91] – 20 = [38.87, 38.91] (y = [38.87, 38.91])</p>	<p>1 mark (M1)</p>		
		<p>Total length of Laser cut path</p> <p>$2x \times 2y + (\text{circumference of } 10 \text{ mm radius circle})$ $= 2x \times 2y + 2 \times \pi \times 10$</p>	<p>1 mark (M1)</p>		
		<p>Correct calculation of path length</p> <p>= 140 + 140 + [38.87, 38.91] + [38.87, 38.91] + (2 × [3.14, 3.142] × 10) = [420.54, 420.66] correct answer only</p>	<p>1 mark (A1)</p>		
		<p>Time taken</p> <p>$\frac{\text{Distance}}{\text{Speed}}$ their $\frac{[420.54, 420.66]}{2200}$ = their 0.19 minutes or their [11.4, 11.5] seconds</p>	<p>1 mark (A1)</p>		
		<p>Time Taken Where no working has been shown but final answer is accurate</p> <p>= 0.19 minutes or [11.4, 11.5] seconds</p>	<p>6 marks</p>		

Qu	Part	Marking Guidance	Total marks	AO										
17		<p>Figure 8 and Figure 9 show two novelty moneyboxes, each with a slot for coins located at the top.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Blow moulded, LDPE moneybox.</p> </div> <div style="text-align: center;">  <p>Injection moulded, PMMA moneybox</p> </div> </div> <p>Analyse and evaluate the suitability of the materials and manufacturing methods used for each of the moneyboxes shown.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Marks</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>9–12 marks</td> <td>The response shows a detailed analysis and evaluation of the suitability of the chosen material and manufacturing process of both moneyboxes. The response clearly evaluates how the properties of the material and the way in which they are manufactured affect the suitability of choice for the manufacture of the moneybox and its suitability in use. Not all elements of each moneybox are required to be covered in equal detail to access this band.</td> </tr> <tr> <td>5–8 marks</td> <td>The response shows good evaluation and analysis of the suitability of the chosen material and manufacturing process of both moneyboxes.</td> </tr> <tr> <td>1–4 marks</td> <td>Basic evaluation of the suitability of the chosen material and manufacturing process of each of the moneyboxes, but tends to be descriptive rather than evaluative.</td> </tr> <tr> <td>0 marks</td> <td>No response or nothing worthy of credit.</td> </tr> </tbody> </table> <p>Indicative content</p> <p>Low density polyethylene (LDPE):</p> <ul style="list-style-type: none"> • a tough material that will withstand the impact from coins being dropped into the moneybox • a thermoplastic that can be easily pigmented in order to create the vivid red colour of the moneybox • although available in translucent colours, the optical clarity of LDPE is not as good as PMMA • LDPE can successfully have screen printed decals applied such as the eyes on the moneybox. <p>Blow moulding:</p>	Marks	Description	9–12 marks	The response shows a detailed analysis and evaluation of the suitability of the chosen material and manufacturing process of both moneyboxes. The response clearly evaluates how the properties of the material and the way in which they are manufactured affect the suitability of choice for the manufacture of the moneybox and its suitability in use. Not all elements of each moneybox are required to be covered in equal detail to access this band.	5–8 marks	The response shows good evaluation and analysis of the suitability of the chosen material and manufacturing process of both moneyboxes.	1–4 marks	Basic evaluation of the suitability of the chosen material and manufacturing process of each of the moneyboxes, but tends to be descriptive rather than evaluative.	0 marks	No response or nothing worthy of credit.	<p>12 marks</p>	<p>AO3 2a AO3 2b</p>
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0 marks	No response or nothing worthy of credit.													

	<ul style="list-style-type: none"> • creates a one-piece hollow shape that would be suitable for the moneybox • can produce an inconsistent wall thickness which may result in the moneybox breaking if dropped • blow moulded products can be post processed in order to create the coin slot or the money bung. • the design of the moneybox is simple with no intricate features and therefore appropriate for manufacture by blow moulding • is an ideal redistribution process for use with thermoplastics making it appropriate for moulding the LDPE moneybox. <p>Polymethylmethacrylate (PMMA) acrylic:</p> <ul style="list-style-type: none"> • excellent optical properties that allow you to easily see the coins contained inside • a rigid material that maintains the shape of the moneybox • can be joined using solvent adhesives or friction welded • prone to scratching from the coins which will reduce the aesthetics over a period of time • a brittle material that may shatter or crack if dropped especially when holding a large volume of coins • PMMA can successfully have screen printed decals applied such as the eyes on the moneybox. <p>Injection moulding:</p> <ul style="list-style-type: none"> • can successfully create the shape and details found on the moneybox • provides consistently accurate mouldings which are vital due to the small cross section of material found on the seam of the two halves of the pig and the aperture for the money bung. • is the most suitable manufacture method for high volume output, appropriate due to the market of the moneybox • is an ideal redistribution process for use with thermoplastics making it appropriate for moulding the PMMA moneybox • snap together fixings can be incorporated into the moulding to assist with the assembly of the moneybox. <p>This list is not exhaustive. Accept any other valid responses.</p>		
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Qu	Part	Marking Guidance	Total marks	AO										
18		<p data-bbox="331 338 1217 405">Describe and explain the stages that timber undergoes from felling through to the creation of the planed square edge (PSE) stock form.</p> <table border="1" data-bbox="331 434 1217 1111"> <thead> <tr> <th data-bbox="336 441 472 490">Marks</th> <th data-bbox="472 441 1212 490">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="336 490 472 748">5–6 marks</td> <td data-bbox="472 490 1212 748">The response shows a detailed understanding of the processes that timber undergoes in order to create the stock form (PSE). The response demonstrates a logical understanding of activities including conversion, seasoning and planing that take place between felling a tree through to processing the stock form (PSE) with an explanation of their importance in the process.</td> </tr> <tr> <td data-bbox="336 748 472 938">3–4 marks</td> <td data-bbox="472 748 1212 938">The response demonstrates a good understanding of the processes that timber undergoes in order to create a stock form. The response describes the main activities that take place with some explanation but may include some inaccuracy.</td> </tr> <tr> <td data-bbox="336 938 472 1055">1–2 marks</td> <td data-bbox="472 938 1212 1055">The response offers a basic understanding of the processes that timber undergoes in order to create a stock form.</td> </tr> <tr> <td data-bbox="336 1055 472 1106">0 marks</td> <td data-bbox="472 1055 1212 1106">No response or nothing worthy of credit.</td> </tr> </tbody> </table> <p data-bbox="331 1146 584 1178">Indicative content</p> <p data-bbox="331 1214 475 1245">Debarking</p> <ul data-bbox="331 1249 1177 1317" style="list-style-type: none"> • The felled timber is debarked and cut into manageable lengths which are then transported to a saw mill for further processing. <p data-bbox="331 1352 496 1384">Conversion</p> <ul data-bbox="331 1388 1201 1523" style="list-style-type: none"> • The logs are then cut into planks in the most economical way to maximise the usable timber. This can be through and through, quarter sawn or radially sawn, depending on the intended use of the timber. <p data-bbox="331 1559 480 1590">Seasoning</p> <ul data-bbox="331 1594 1197 2042" style="list-style-type: none"> • The planks are then seasoned to remove the 80–90% excess moisture stored in the timber. Without the removal of this moisture, the timber is prone to splitting and warping. • The seasoning can be either air seasoning or kiln dried seasoning. • The air seasoning is a traditional inexpensive method where the timber is stacked outdoor but under cover with stickers placed between the planks to allow for air to circulate and the slow removal of moisture. • Kiln dried seasoning is more expensive, where the planks are spaced and stacked on a trolley and placed in a kiln for a short period of time. Kiln dried seasoning is more controlled and produces timber particularly suitable for indoor use. 	Marks	Description	5–6 marks	The response shows a detailed understanding of the processes that timber undergoes in order to create the stock form (PSE). The response demonstrates a logical understanding of activities including conversion, seasoning and planing that take place between felling a tree through to processing the stock form (PSE) with an explanation of their importance in the process.	3–4 marks	The response demonstrates a good understanding of the processes that timber undergoes in order to create a stock form. The response describes the main activities that take place with some explanation but may include some inaccuracy.	1–2 marks	The response offers a basic understanding of the processes that timber undergoes in order to create a stock form.	0 marks	No response or nothing worthy of credit.	6 marks	AO4 1b
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		<p>Planing</p> <ul style="list-style-type: none"> The seasoned plank is then further processed by planing into the stock form (PSE), where the rough sawn edges are removed and a piece of timber with dimensional accuracy is produced. <p>Stages 1 and 2 are interchangeable.</p> <p>This list is not exhaustive. Accept any other valid responses.</p>		
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Qu	Part	Marking Guidance	Total marks	AO
19		<p>Describe two ways that a jig can be used to improve accuracy in manufacture.</p> <p>One mark for a simple statement relating to the use of a jig.</p> <p>Two marks for a detailed description that clearly explains how accuracy can be improved.</p> <p>Indicative content</p> <ul style="list-style-type: none"> A jig improves accuracy by removing the need for measuring and marking out to take place each time a cut is made or a hole drilled. This removes the potential for human error throughout the marking out process. A jig can improve the accuracy of manufacturing a particular joint, by securely holding the workpiece while also guiding the cutting tool, eg when cutting a mitre joint in timber or when drilling a hole. A jig can be used to ensure consistency when manufacturing a product, eg guiding a router around a particular profile ensuring consistency and accuracy where two kitchen worksurfaces may join. <p>This list is not exhaustive. Accept any other valid responses.</p>	2 x 2 marks	AO4 1b

Qu	Part	Marking Guidance	Total marks	AO										
20		<p>Justify why Finite Element Analysis (FEA) may be used to improve efficiency during product development.</p> <table border="1" data-bbox="331 434 1222 1041"> <thead> <tr> <th data-bbox="331 434 472 490">Marks</th> <th data-bbox="472 434 1222 490">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="331 490 472 678">5–6 marks</td> <td data-bbox="472 490 1222 678">The response demonstrates excellent justification and explanation of why FEA can be used to improve efficiency. Response directly refers to how factors such as time, cost and material usage are impacted by the use of FEA.</td> </tr> <tr> <td data-bbox="331 678 472 866">3–4 marks</td> <td data-bbox="472 678 1222 866">The response provides good justification and explanation of why FEA can be used to improve efficiency. Response provides some evaluation of how efficiency is improved, with reference to factors such as time, cost and material usage.</td> </tr> <tr> <td data-bbox="331 866 472 987">1–2 marks</td> <td data-bbox="472 866 1222 987">The response shows a basic justification of how FEA can be used to improve efficiency, but tends to be descriptive rather than evaluative.</td> </tr> <tr> <td data-bbox="331 987 472 1041">0 marks</td> <td data-bbox="472 987 1222 1041">No response or nothing worthy of credit.</td> </tr> </tbody> </table> <p>Indicative content</p> <ul style="list-style-type: none"> • FEA can help a designer identify a weakness in the structure of a design before time has been taken to produce a physical prototype. • FEA allows designers to test how different materials could be used without the expense of producing various iterations of a prototype. • Inappropriate designs can be discounted at an early stage of development saving time and resources and allowing designers to work more efficiently. • A degree of stress testing can take place with instant feedback without the cost and time that would be needed if third party companies were used. • FEA can be undertaken throughout the development process allowing manufacturers to refine individual components before manufacture. • Testing can take place and maximum working loads calculated. • There is no need for destructive testing to take place and therefore reducing the material used to make numerous physical prototypes. • Simulations in different environmental conditions can take place such as extremes of temperature, reducing the need for costly testing facilities. <p>This list is not exhaustive. Accept any other valid responses.</p>	Marks	Description	5–6 marks	The response demonstrates excellent justification and explanation of why FEA can be used to improve efficiency. Response directly refers to how factors such as time, cost and material usage are impacted by the use of FEA.	3–4 marks	The response provides good justification and explanation of why FEA can be used to improve efficiency. Response provides some evaluation of how efficiency is improved, with reference to factors such as time, cost and material usage.	1–2 marks	The response shows a basic justification of how FEA can be used to improve efficiency, but tends to be descriptive rather than evaluative.	0 marks	No response or nothing worthy of credit.	6 marks	AO3 2a AO3 2b
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21		<p>Explain why tungsten carbide is an appropriate material for the manufacture of a centre lathe cutting tool.</p> <table border="1" data-bbox="331 434 1222 1041"> <thead> <tr> <th data-bbox="331 434 472 490">Marks</th> <th data-bbox="472 434 1222 490">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="331 490 472 714">5–6 marks</td> <td data-bbox="472 490 1222 714">Detailed understanding why tungsten carbide would be a suitable material for a cutting tool. Response should refer to the physical and mechanical properties of tungsten carbide and be specifically related to the cutting tool context. Not all indicative content needs to be included in order to access the top mark band.</td> </tr> <tr> <td data-bbox="331 714 472 904">3–4 marks</td> <td data-bbox="472 714 1222 904">Good understanding of why tungsten carbide would be a suitable material for a cutting tool. Response may refer to the physical or mechanical properties of tungsten carbide and its suitability for the cutting tool context.</td> </tr> <tr> <td data-bbox="331 904 472 987">1–2 marks</td> <td data-bbox="472 904 1222 987">Basic understanding of why tungsten carbide is used for a centre lathe cutting tools.</td> </tr> <tr> <td data-bbox="331 987 472 1041">0 marks</td> <td data-bbox="472 987 1222 1041">No response or nothing worthy of credit.</td> </tr> </tbody> </table> <p>Indicative content</p> <ul data-bbox="331 1149 1222 1697" style="list-style-type: none"> • The combination of tungsten and carbon produces a hard material which will allow the cutting tool to resist the wear associated with cutting a rotating material. • Tungsten carbide can maintain a sharp tool edge for longer while producing a better-quality finish. • Tungsten carbide is an extremely hard material so is suitable for use on a wide range of softer metals. • Tungsten carbide has good corrosion resistance which enables it to be used with a range of lubricants and coolants. • Tungsten carbide can be formed by sintering into an appropriate shape for the cutting tool tip. • The porous nature of sintered product can assist cutting when using a lubricant. • Tungsten carbide is dimensionally stable at high temperatures associated with friction involved with cutting and shaping materials. <p>This list is not exhaustive. Accept any other valid responses.</p>	Marks	Description	5–6 marks	Detailed understanding why tungsten carbide would be a suitable material for a cutting tool. Response should refer to the physical and mechanical properties of tungsten carbide and be specifically related to the cutting tool context. Not all indicative content needs to be included in order to access the top mark band.	3–4 marks	Good understanding of why tungsten carbide would be a suitable material for a cutting tool. Response may refer to the physical or mechanical properties of tungsten carbide and its suitability for the cutting tool context.	1–2 marks	Basic understanding of why tungsten carbide is used for a centre lathe cutting tools.	0 marks	No response or nothing worthy of credit.	6 marks	AO4 1c
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22		<p data-bbox="331 331 1217 398">Outline how and why a company would use social media to market their product.</p> <table border="1" data-bbox="331 434 1217 1010"> <thead> <tr> <th data-bbox="331 434 472 490">Marks</th> <th data-bbox="472 434 1217 490">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="331 490 472 678">5–6 marks</td> <td data-bbox="472 490 1217 678">The response shows a detailed understanding of how and why social media would be used by a company to market their product. The response may refer to the area of marketing, the interaction with the consumer and the beneficial impact on the company.</td> </tr> <tr> <td data-bbox="331 678 472 831">3–4 marks</td> <td data-bbox="472 678 1217 831">The response demonstrates some understanding of how and why social media would be used by a company to market their product and some awareness of the methods used or the benefits to the company.</td> </tr> <tr> <td data-bbox="331 831 472 954">1–2 marks</td> <td data-bbox="472 831 1217 954">The response offers a basic understanding of how social media would be used by a company to market their product.</td> </tr> <tr> <td data-bbox="331 954 472 1010">0 marks</td> <td data-bbox="472 954 1217 1010">No response or nothing worthy of credit.</td> </tr> </tbody> </table> <p data-bbox="331 1043 584 1077">Indicative content</p> <ul data-bbox="331 1111 1217 1962" style="list-style-type: none"> • Social media can allow a company a worldwide platform on which to market their product. This in turn can lead to increased sales, exports and the appointment of regional or national distributors. • Social media is more cost effective than the traditional costs associated with advertising or distribution of marketing material. Costs are passed on to the consumer through internet subscription or data plans. • Advertising campaigns can be pushed out daily due to the digital nature of the advert and the relative ease in which a graphical communication can be produced. • Potential customers can be alerted to a brand via linking techniques such as ‘hashtags’ providing the company with increased coverage and associating them with similar companies. • User reviews or recommendations can be instantly shared online through ancillary platforms such as ‘Trustpilot’. This allows a company to share ‘real life’ consumer reviews, user videos and endorsements of their product. • Companies could use product placements in online videos or have their product endorsed by social media influencers, popular channels or celebrity accounts. • Companies can use data from ‘cookies’ to target individual marketing campaigns based on location or historically browsing patterns. <p data-bbox="331 1995 1198 2029">This list is not exhaustive. Accept any other valid responses.</p>	Marks	Description	5–6 marks	The response shows a detailed understanding of how and why social media would be used by a company to market their product. The response may refer to the area of marketing, the interaction with the consumer and the beneficial impact on the company.	3–4 marks	The response demonstrates some understanding of how and why social media would be used by a company to market their product and some awareness of the methods used or the benefits to the company.	1–2 marks	The response offers a basic understanding of how social media would be used by a company to market their product.	0 marks	No response or nothing worthy of credit.	6 marks	AO4 1b
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