

Examiners' Report
June 2014

GCE Design and Technology 6GR02 01

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June 2014

Publications Code US038533

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Introduction

It is clear that the majority of candidates prepare very well for their examination and are able to demonstrate their knowledge and understanding well through their responses, be that in the form of written responses or annotated sketches.

The more able candidates tend to be those who read the question and respond with specifics. These candidates gain more marks than those who write around the subject with generic responses which have a vague link to the question topic. One aspect that continues to be disappointing is that there are still a small number of candidates who believe that it is acceptable to respond to all questions with generic, generalised answers; such as 'strong, fast, quick, cheap etc...'. These are low knowledge level responses and show only a basic understanding of some aspects of the subject; therefore they can only gain low marks.

Candidates need to know the information and subject which they are being questioned about and organise this information effectively to answer the question set, rather than write as much as possible in an attempt to ensure their response will gain some marks somewhere in the script. Related to this, whilst it is clear that most candidates use the time in the exam well, some candidates still find the need to use additional pages to complete answers. The spaces provided in the examination paper are larger than we would expect any answer to take. Most candidates use this space wisely; however, given that additional pages continue to be used, centres should assist candidates during their exam preparation to write concisely.

Question 1 (a)

This question is aimed at testing the candidates' knowledge of the properties of materials; specifically those of acrylic, and how these properties relate to the use of acrylic for the menu holder shown in the question.

This is a knowledge based 'give' question, so a single word answer would be acceptable. It is useful to refer to the published mark scheme when looking at the examples to clearly see where marks are given.

(a) Give **one** aesthetic and **one** functional reason why acrylic is used for the menu holder. (2)

Aesthetic

Acrylic can be coloured to match brand identity

Functional

Acrylic is used as it can be easily moulded for mass production/batch



ResultsPlus Examiner Comments

This response is typical of a candidate who has correctly stated two properties of acrylic. However, this was only awarded one mark for the aesthetic property (Acrylic can be coloured) as the functional property given does not relate to the application of acrylic for the menu holder. The menu holder itself is constructed from several pieces of acrylic bonded together rather than moulded.



ResultsPlus Examiner Tip

In questions such as this where candidates are asked to link the properties of the material to the given application, it is important that these properties are relevant. In this instance the property is not relevant, therefore the mark is not awarded.

Aesthetic

Can be made in a range of colours.

Functional

Is Durable and water resistant.



ResultsPlus Examiner Comments

In this response the candidate has correctly given responses for both the aesthetic and functional properties of acrylic. Both of these responses are related to the use as a menu holder, with coloured or colourful being a common response from many candidates. For the functional properties the candidate has offered two responses, both relevant and correct.

Question 1 (b)

This question allows the opportunity for candidates to demonstrate their understanding of the benefits of using a laser cutter for the production of the menu holder. There should be some form of comparison to traditional methods of manufacturing such as using hand tools.

Despite this being a 'give' question, candidates would be unlikely to gain credit for single word answers as these are unlikely to provide any form of comparison or benefit over traditional methods of manufacturing.

(b) The acrylic used for the menu holder has been laser cut. Laser cutting is a fast method of production.

Give **two** other advantages of laser cutting over traditional cutting methods.

(2)

- 1 As it is computer automated it reduces human error.
- 2 Design can be ~~more difficult~~ engraved with the laser.



ResultsPlus

Examiner Comments

This is a higher level response which scored 2 marks. The candidate has given two appropriate advantages of using a laser cutter over traditional methods. The reference to being computer automated reducing human error shows a good understanding of the process which is then expanded upon by the reference to the ability to also engrave the acrylic.



ResultsPlus

Examiner Tip

The candidate has addressed the question well and has demonstrated good examination technique by providing short yet detailed answers. The points made are appropriate for the use of a laser cutter with acrylic, and are in addition to the benefit given in the question of being a faster process.

Question 1 (c)

This is an 'explain' question and therefore requires a valid point and a relevant (and related) explanation. It is not sufficient to write single word answers, or a collection of unrelated points.

The question focuses on the disadvantages of encapsulation with relation to the use of the process for a menu. There was no requirement for candidates to consider other methods of adding a protective coating to the menu, purely the disadvantages of the process. Credit was given for responses which related to the actual process, or the impact of the use of encapsulation in the short term. There was no credit given for responses which related to the general wear-and-tear of the menu such as edges becoming torn as the focus of the question is on the process.

(c) The card menu insert is finished using a process called encapsulation.

Explain **one** disadvantage of encapsulation.

(2)

Encapsulation of card means you are unable to recycle the card after use as there is plastic coating the card.



ResultsPlus Examiner Comments

In this response the candidate has given an appropriate disadvantage of using encapsulation for one mark. In this instance the candidate has stated that you are unable to recycle the card. They have then expanded upon this with a relevant extension point (plastic contaminates the card) to reinforce the disadvantage. This has allowed them to access both of the marks available for this question.



ResultsPlus Examiner Tip

When a question asks candidates to explain, the marks are usually awarded for identifying a valid point and then expanding upon this with a supporting statement or justification.

Encapsulation covers the edges of the card but this leaves a surrounding of plastic which loses aesthetic quality.



ResultsPlus Examiner Comments

As stated in the introduction, responses which did not focus on the actual process of encapsulation or issues directly related to it gained little or no credit. In this instance the candidate is making reference to the aesthetic appeal of the menu, which in itself is highly subjective, and therefore is not addressing the question asked. This response would gain no marks.

Question 1 (d)

Often, questions at AS level involve 'completing the table'. These often require short phrase responses and for the responses to be linked together in some way. In this case the link is between two different risks and appropriate control measures for each.

This is a knowledge based 'state' question, so a single word or single phrase would be acceptable.

The response given here by the candidate states two specific control measures for both the risk of inhalation of vapours and also risks associated with unsafe storage.

The examples given are all appropriate, with ventilation and face masks being popular responses amongst candidates as control measures against the risk of vapours, with signage, storing in a yellow metal cupboard or a locked cupboard being common responses as control measures for unsafe storage.

(d) Acrylic cement is used in a school to join pieces of the menu holder.

Complete the risk assessment table below.

Hazard	Risk	People at Risk	Control Measure
Using acrylic cement	Inhalation of vapours	User	respiratory face masks. (1)
			work in a well ventilated area. (1)
	Unsafe storage	Students/ staff	Prohibited Prohibited signage. (1)
			store in a metal cupboard -locked. (1)



ResultsPlus Examiner Comments

This candidate has provided four specific control measures and has gained full marks. Generic responses such as 'use PPE' or 'keep out of reach' are low level responses and should be avoided as they are unlikely to gain credit.



ResultsPlus Examiner Tip

Try to avoid generic terms such as 'use PPE' as these are unlikely to gain full marks, and will limit achievement on questions such as this one.

Question 1 (e)

This is a knowledge based 'outline' question which requires candidates to outline the main features of a coordinate measuring machine (CMM).

Since candidates are more familiar with questions which ask about the benefits of using such technologies, or what these types of equipment are used for, only a small proportion of candidates actually answered the question which was asked, which was about the features of the equipment itself.

(e) Computer-aided inspection uses a co-ordinate measuring machine (CMM) to ensure dimensional accuracy of products during production.

Outline the main features of a CMM.

(2)

a scanner to check the dimensions of the product which often uses a laser to increase accuracy. And a computer reader to interpret this new information.



ResultsPlus Examiner Comments

In this response the candidate has addressed the question correctly. They have identified that a scanner or laser often features in the system, and that this is linked to a computer reader which interprets the information. These are features of the equipment, and therefore both gain one mark.



ResultsPlus Examiner Tip

It is important to fully read the question before offering an answer. In this case many candidates made the mistake of answering the question which they thought they had been asked, rather than the actual question set.

(2)

CMM is a computer technology that tests for dimensional accuracy and tests the product against the tolerance to ensure that the product is suitable to go on to the next stage of production. (Total for Question 1 = 12 marks)

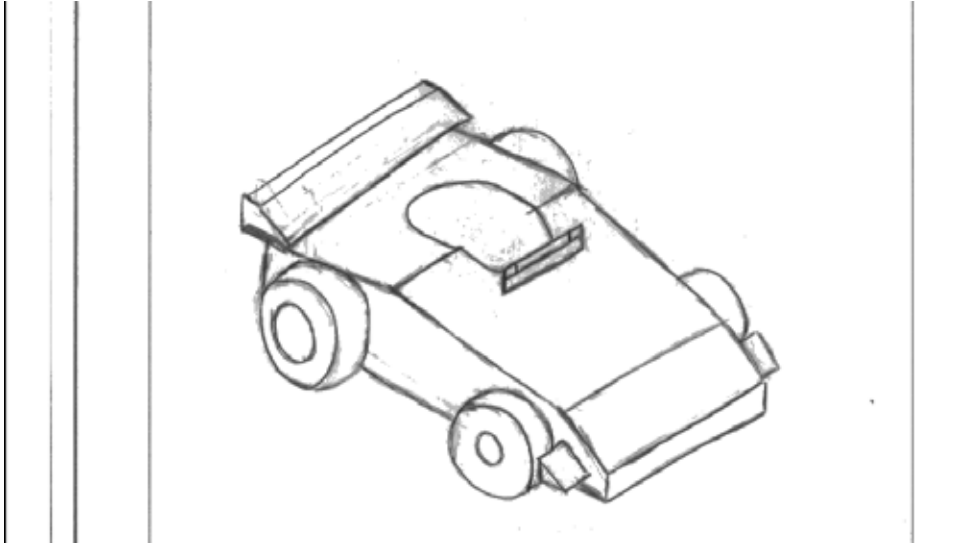


ResultsPlus Examiner Comments

In this instance the candidate has given a response which outlines what a CMM is used for. As a result they have gained zero marks as this is not what is being asked in the question.

Question 2 (a)

The purpose of this question is to examine the candidates' ability to interpret a given drawing and to then present the information in a different format. In this instance an orthographic drawing had to be interpreted in order to produce an isometric sketch. As with similar types of questions in previous series, candidates did not have to produce an exact drawing, they did however need to be able to sketch a version of the car which was in the main correct. It was not required to include all of the features in order to gain full marks. The award of marks can be seen in the mark scheme, and is explained in the examples of work shown below.



ResultsPlus Examiner Comments

The candidate has gained the full five marks for this response. These have been awarded as follows:

- 1 mark for being an isometric sketch
- 1 mark for showing the correct sloping body of the car
- 1 mark for the correct interpretation of the rear fin
- 1 mark for showing at least two of the wheels as ellipses in the correct orientation
- 1 mark for showing the driver's cockpit in the correct location and to an appropriate size.

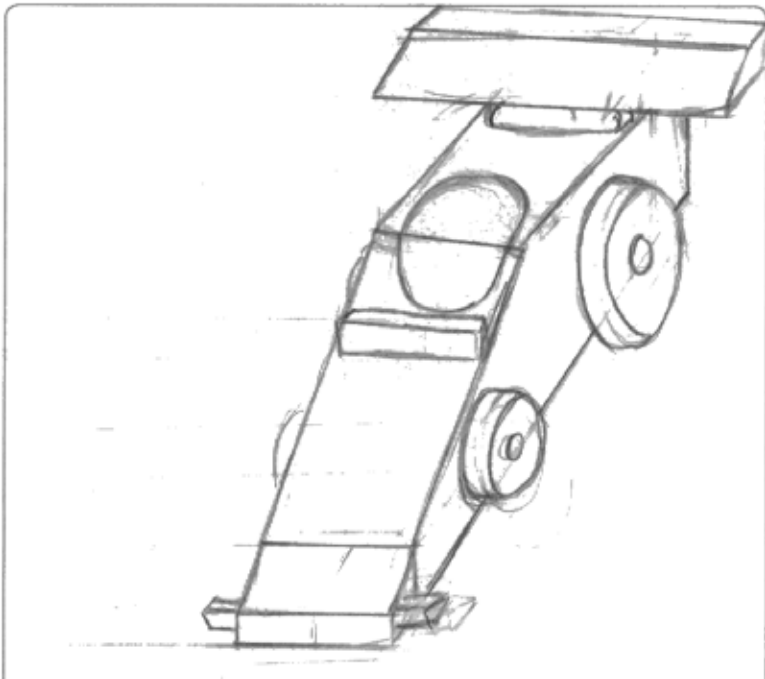
This response could also have gained marks for the windscreen and the correct front fin.



ResultsPlus Examiner Tip

For sketching questions it is important to make sure that the response is drawn to an appropriate size, as this allows the examiner to identify the features which are being looked for.

(5)



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Examiner Comments

Whilst the drawing is not isometric in its format, there is an attempt at a 3D representation of the car.

The response scored 3 marks. The candidate gained some credit for the rear fin being drawn with accuracy, the correct slope to the body of the car and the positioning of the driver's cockpit.

It would not be possible to award further credit as the wheels are not shown as ellipses, the drawing is not isometric and the windscreen is incorrectly shown as reaching across the whole of the car body.

Question 2 (b)

This question focuses on one of the materials which are listed in the specification, namely balsa wood, and how the properties of balsa make it appropriate for the modelling of the toy car in the question.

As an 'explain' question, to gain full marks the response should be presented in full sentences, i.e. a point with a valid point and linked explanation of that point.

(b) The designer will model the prototype toy using balsa wood.

Explain why balsa wood is a suitable material for modelling the prototype toy.

(2)

balsa is light weight and soft therefore easy to handle shape by sanding and sawing, to give smooth curves quicker. Also it is relatively inexpensive therefore not a lot of money needed to make a prototype

(Total for Question 2 = 7 marks)



ResultsPlus Examiner Comments

This response scored 2 marks. The candidate has offered a wide range of appropriate reasons as to why balsa could be used for the manufacture of the prototype model. The link between the material being soft and therefore easy to shape by sanding and sawing is a good example of providing a justified answer.



ResultsPlus Examiner Tip

When a question asks for reasons why a material is suitable for an application it is important to ensure that the properties given have a direct relationship to the application.

Question 3 (a)

This question is a further example of the type where candidates must relate the properties of a material to an application. In this instance, the question focuses on the use of solid white board for a slip case. The answers given must therefore relate to the application.

This is a knowledge based 'state' question therefore single word or short answers are allowable and would gain credit.

(a) State **two** properties that make solid white board a suitable material for the slipcase. (2)

1. Lightweight

2. Good print quality



ResultsPlus Examiner Comments

The candidate has gained full marks for their response which indicates that solid white board is lightweight. The identification that there would be a good print quality makes a link to the material offering a good printing surface.



ResultsPlus Examiner Tip

This response is an example of good examination technique. The responses answer the question whilst allowing candidates more time to focus on the longer evaluation type questions further into the paper.

1. Solid white board has an excellent printing surface

2. Solid white board is fairly rigid and tough



ResultsPlus Examiner Comments

This response scored 2 marks and is similar to the previous example. However, the candidate has given much longer answers. This is a demonstration of including more information than is necessary.



ResultsPlus Examiner Tip

It is good examination technique to respond with single word answers where this is appropriate.

Question 3 (b)

This question tests the candidates' wider knowledge of levels of production, and more specifically that of batch production. The focus of the question is on the appropriateness of batch production for the production of paperback books and asks them to explain the reasons for its use. In this instance, candidates are expected to provide a response which identifies one feature and then offer a justification. There is no credit for providing a description of batch production.

(b) The paperback books are printed in batches.

Explain **one** reason why books are batch produced. ← advantage

(2)

Batch production is flexible - it can quickly respond to market trends



ResultsPlus Examiner Comments

The candidate has provided a concise answer which scored 2 marks. The response offers the reason for batch production (batch production is flexible) along with the justification (can quickly respond to market trends). Many candidates offered responses similar to this one, with flexibility of production and being able to respond to demand being common.



ResultsPlus Examiner Tip

For explain type questions the justification given for the reason must be linked. If there is no link, then only one mark would be awarded.

(b) The paperback books are printed in batches.

Explain **one** reason why books are batch produced.

(2)

The batch production allows flexibility
so all three books could be produced
in the same production run with little
extra cost



ResultsPlus Examiner Comments

This response scored 1 mark. The candidate has correctly identified that batch production allows flexibility. The justification given is not correct, therefore a second mark cannot be awarded. If the candidate had stated that all three books could be produced with the same equipment then the justification would have been appropriate and the second mark awarded.

Question 3 (c)

This is an 'explain' question and therefore requires a valid point and a relevant (and related) explanation for each of the two disadvantages. It is not sufficient to write single word answers or a collection of unrelated points. A valid point without expansion will only gain one mark.

The question focuses on the disadvantages of perfect binding, and although not on comparisons with other forms of binding, where a disadvantage was given which makes a valid comparison with a different process, credit was given.

The question focuses on the disadvantages of the binding method for a set of books; therefore it is appropriate for candidates to include cost, appearance and durability in their answers.

(c) Explain **two** disadvantages of perfect binding.

(4)

1 Perfect binding is expensive, so it will add to the cost of the product, meaning the market price will be higher.

2 You can't open the pages out flat; instead they have to be held open which could cause fatigue to the user.



ResultsPlus Examiner Comments

This response gains 4 marks as both disadvantages are expanded upon. The first disadvantage gains two marks for stating that the process is expensive (1 mark) and will add to the cost of the product (1 mark). The second disadvantage also gains 2 marks, with 1 mark for 'you can't open the pages out flat', and a second mark for the consideration of needing to hold open the book (making it harder to read).



ResultsPlus Examiner Tip

In 'explain' questions answers must be expanded upon. A series of unrelated points will not gain full marks. It is also important to ensure that when asked for more than one advantage or disadvantage that these are significantly different.

Question 3 (d)

This question is in the form of a discuss question and candidates are asked to consider the benefits of using passive transponder RFID tags for a retailer. As such, the response should consider only the retail environment and the ways in which the use of RFID tags can be advantageous. There was no requirement for candidates to explain how RFID tags work, nor to explain the difference between passive and active transponder tags.

They can insure the book is not stolen from the store using receivers and in addition aids the retailer to catalogue the books they are selling.



ResultsPlus Examiner Comments

This response scored 2 marks. This is an example of a typical response from candidates with many making reference to the use of RFID tags for security and for stock control purposes. As this is a discuss question, many candidates provided a list of ways in which the tags benefitted the retailer. In the majority of cases, there was no link between the points; however the higher level responses did tend to offer a link of some form.



ResultsPlus Examiner Tip

This is a good response which presents ideas logically. Answers such as this demonstrate the knowledge of the candidate clearly and are easier for the examiner to mark. A third valid point would have allowed access to all of the marks available.

Question 3 (e)

The specification lists numerous materials and processes, some of which may be commonly used in schools but not on an industrial scale. This question requires the candidates to have knowledge of one of these processes, i.e. die cutting.

In this question, candidates were asked to identify the quality control checks which would be required at three stages of production. It is important that candidates know the difference between quality control and quality assurance, with the focus being on checks being to ensure the quality of the production run. As a 'state' question, single word or short answer responses can gain credit.

It is useful to refer to the published mark scheme when looking at the examples to clearly see where marks are given.

- (e) Continuous quality control (QC) checks are made throughout the production of the printed solid white board slipcase.

Complete the table below by stating **one** quality control check for each stage of production of the printed solid white board slipcase.

Manufacturing stage	Quality control check
Preparation of materials	Check the quality of materials received, has the solid white board got any imperfections. (1)
Printing/production	Registrar checks, are all the colours lined up correctly and in the right position. (1)
Folding/assembly	Do all three books fit in the Are the folds in the right position to fit all 3 books inside. (1)



ResultsPlus Examiner Comments

The candidate has gained full marks for this response with an appropriate quality control check being identified for each of the manufacturing stages.

Checking the quality of the materials for imperfections is acceptable for the preparation of materials. Registrar checks being appropriate for printing and checking the folds are in the right places for folding/assembly.



ResultsPlus Examiner Tip

It is important that the answers given relate to the specific stage of production as credit would not be given to an answer in the incorrect cell of the table.

Question 4 (a)

This is an 'explain' question and therefore requires two valid points and a relevant (and related) explanation for each. It is not sufficient to write single word answers, or a collection of unrelated points.

The question focuses on the advantages of using desktop publishing for the design of greetings cards. Material costs and other factors which would be related to any form of computer aided designing are therefore irrelevant, as these are not specific to desktop publishing. The concept here is that DTP offers greater levels of flexibility and creativity as a range of design features are all combined into one software package.

(a) The card has been created using desktop publishing (DTP).

Explain **two** advantages of using desktop publishing.

(4)

1. Allows you to use a combination of tools, for example inserting your own images, creating your own text, and using your colours to meet your requirements.
2. DTP allows editing to be made easier. Rather than starting again like traditional methods it enables you to undo/redo, zoom in/out and cut/copy ~~making~~ making it more efficient to use.



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Examiner Comments

The candidate response gains the full 4 marks as there are two advantages, both of which have been expanded upon with a relevant justification.

In the first response, the candidate identifies that images can be imported, gaining one mark. This is expanded upon by stating that this can meet your requirements (personalised design) for the second mark.

The second response states that editing is easier (1 mark) with a number of specific tools named for a second mark.

This is a full and detailed answer which shows the candidate has a clear and solid understanding of the desktop publishing process.



ResultsPlus
Examiner Tip

Whilst not a model answer, this candidate has identified two key advantages and has justified them in the response. Questions such as this are best answered in paragraph form as it is often easier to link the advantage to the justification.

Question 4 (b)

'Describe' questions require a response that is based around full detailed sentences, often linked together. In this case three separate points are needed for full marks.

This question focuses on how piezoelectric actuators produce sound in a greetings card, and not a generic description of the process by which a greetings card would play music.

Many candidates considered piezoelectric transducers as opposed to actuators and therefore gained few or no marks.

(b) The musical birthday card uses a piezoelectric actuator device to make the musical sound.

Describe how piezoelectric actuators work. (3)

Piezoelectric crystals expand and contract when a current is applied. In the card, the actuator is a device for controlling the mechanism. When, on opening the card, a thin slip is removed from the mechanism, the piezoelectric crystals vibrate and act as a speaker driver, allowing a pre-recorded tune to be played.



ResultsPlus

Examiner Comments

The candidate has gained the full 3 marks for this response. They have identified that the crystals vibrate when a current is passed through them; they have also noted that these effectively act as a speaker and that this allows a pre-recorded sound to be played.

There are other points in the response which could also gain the candidate credit, such as the removal of the insulated tab to complete the circuit.



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Examiner Tip

It is important to fully read the question at all times. In questions such as this it is easy to give an incorrect answer by not fully reading what is being asked.

As you open the card, you trigger a vibration to the piezoelectric crystals. This creates a voltage in the circuit and plays a pre-recorded ^{sound} message, generating sound.



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Examiner Comments

This response did not score any marks. It is an example of a common mistake made by many candidates, as there was often confusion between piezoelectric actuators and transducers. In this case, the candidate has given an answer which initially makes reference to the operation of a transducer. The candidate does not gain any credit for stating that a pre-recorded sound is played as the content prior to this in the response is not correct and is generic for musical cards.



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Examiner Tip

Whilst it is good practice to offer a full and detailed response to a question, credit is not given for responses which are generic or repeat aspects of the question.

Question 4 (c)

The specification lists numerous materials and technologies, some of which may not be commonly used in schools, although they are often familiar to candidates in their wider experiences. This question requires the candidates to have knowledge of one of these technologies, i.e. the use of smart inks.

In this question, candidates were asked to produce annotated sketches to explain how images are produced using smart inks.

Given the importance of some of the features of the technology, it is useful to refer to the published mark scheme when looking at the examples to clearly see where marks are given.

(c) Birthday cards can be manufactured using smart ink.

Describe, using annotated sketches, how images are produced using smart ink. (4)

Positively charged particles with white pigment

Negatively charged particles with black pigment

Dark end

Light end

Gel

Particles beginning to switch sides

The black pigment (negative particles) produces the darker areas of the image, the white pigment (positive particles) does the opposite and produces the lighter areas of the image



ResultsPlus
Examiner Comments

This response scored 4 marks. The candidate shows a very good understanding of how smart inks can be used to create images. The annotation is very clear and adds further detail to the sketches. The top and bottom electrodes are shown in all of the three sketches, these being two features which are required in order to gain full marks. Further, the particles are clearly labelled with their charges gaining another two marks.



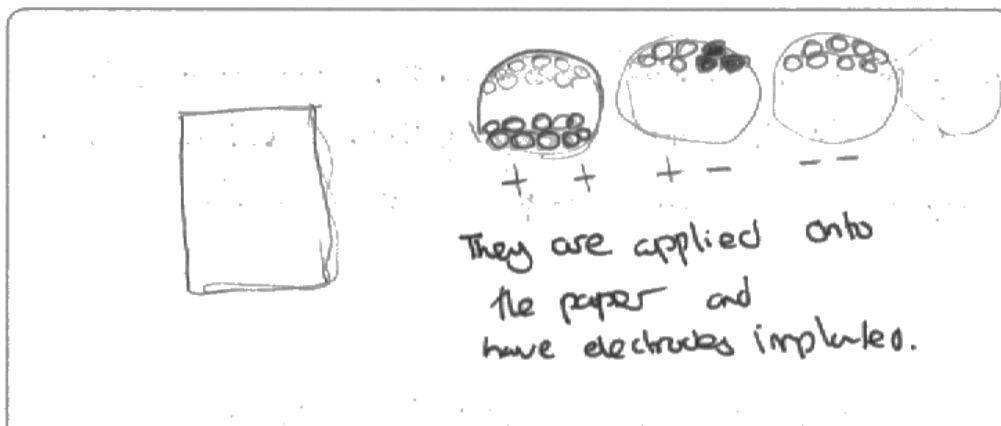
ResultsPlus
Examiner Tip

The clarity of the sketching and the concise annotations combine to produce a very good answer. Whilst it is important to address both aspects of the question (annotation and sketching), it is important that candidates include only that information which adds clarity to their response.

(c) Birthday cards can be manufactured using smart ink.

Describe, using annotated sketches, how images are produced using smart ink.

(4)



ResultsPlus Examiner Comments

This response is an example of a common, lower level response where the candidate clearly has some understanding of the key features of smart ink. However, in this response they have only gained one mark, which is awarded for showing the different combinations of charge which could be applied to the bottom electrode.

The candidate could have improved their response by labelling the charges of the black and white particles along with the inclusion of the top and bottom electrodes.



ResultsPlus Examiner Tip

When a question asks for annotated sketches, it is important to make sure that the response includes both of these aspects. Annotations need not be detailed, but do need to describe the sketch. In this instance, the annotation does not add anything to the response.

Question 5 (a) (i)

This is an 'explain' question and therefore requires two linked points to be made in order to gain both marks. It is not sufficient to write single word answers; however short answer responses are acceptable providing they have valid points which are related. The focus of the question is the parison and how the bottle shape is produced from it in the blow moulding process.

(a) Blow moulding is used for the production of the polymer bottle.

(i) Explain how the bottle shape is produced from the parison.

(2)

The ~~pari~~ parison is clamped in a mould and then filled with ~~air~~ air so it expands hollowly to fill the mould and take its shape.



ResultsPlus Examiner Comments

The candidate response identifies two stages in the production of the polymer bottle from the parison. The candidate gains one mark for stating 'then filled with air' and a further mark for 'so it expands hollowly to fill the mould'.

Whilst not a model answer, the candidate has correctly identified these stages and gains full marks.



ResultsPlus Examiner Tip

In this instance whilst the question asks the candidate to explain how the bottle is formed there is no need for a justification of the point although this will be implicit in the response. For example, this response could be written as two separate points. Air is pumped into the parison. The parison expands to fill the mould. This would still gain the two marks.

Question 5 (a) (ii)

This is an 'explain' question and therefore requires two linked points to be made in order to gain both marks. It is not sufficient to write single word answers, however; short answer responses are acceptable providing they are valid points and related. The focus of the question is the need to cool the mould used for blow moulding.

(ii) Explain why the mould is cooled.

(2)

= Because if the plastic were still liquid it would drip out of the mould and ~~run~~ run, ruining the structural integrity of the bottle. Instead it needs to be cooled and solid, so it can be removed intact and safely, without causing any burns.



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Examiner Comments

The initial part of the response does not gain the candidate any credit as it is not accurate. However, two linked and valid points are made as the response develops which allows access to both marks. In this instance, the first mark is gained for stating that cooling helps the bottle to solidify, which in turn allows it to be removed intact for the second mark.



ResultsPlus
Examiner Tip

Answers are always marked positively and credit will be given providing the overall context of the response is correct.

Question 5 (b)

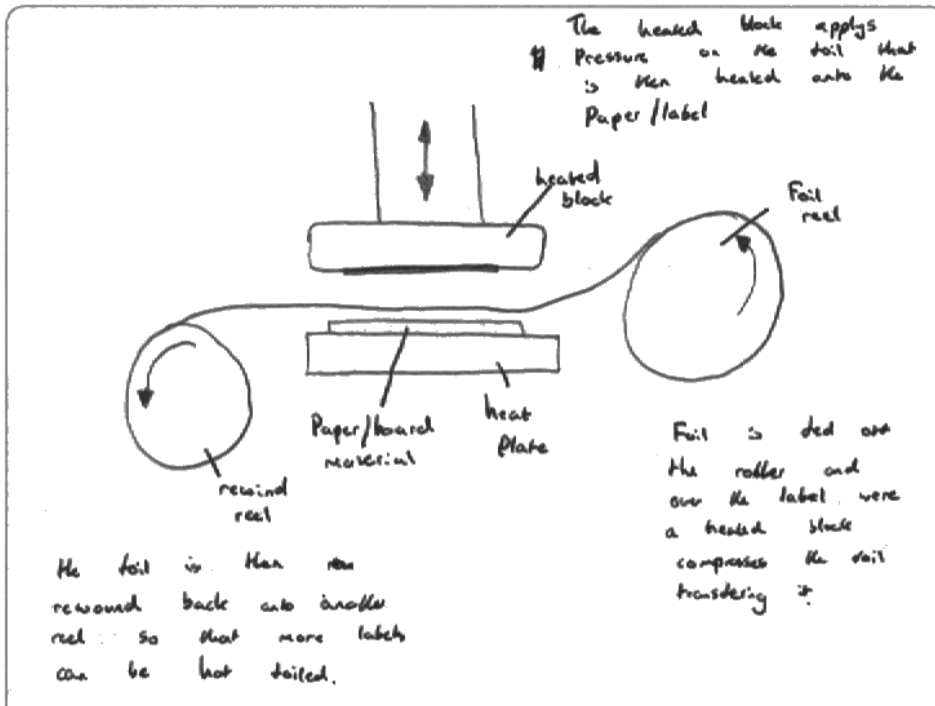
This question allows the opportunity for candidates to describe the process of hot foil blocking using annotated sketches.

It provides the opportunity for candidates to show they have a sound understanding of process and the equipment and consumables which need to be present in order to complete the process.

In this case it is a 'describe' question so requires features to be identified and also the annotation to provide a basic description of the process.

Describe, using annotated sketches, the hot foil blocking process.

(4)



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Examiner Comments

This is an example of a response which gained full marks.

The sketch clearly shows the heated die, with an arrow indicating that pressure is applied onto the foil and the paper below. The reels for the foil are also identifiable as is the paper label which will be having the hot foil blocking applied to.



ResultsPlus

Examiner Tip

Where a question asks for an annotated sketch, candidates should ensure that their annotations can clearly explain any aspects of the process which are not explicitly clear from the sketch drawing.

Question 5 (c)

Evaluation questions require candidates to answer fully, using detailed justified responses that flow in paragraph form. Short responses for evaluation questions gain little credit.

Candidates must ensure they include reference to both advantages and disadvantages for maximum marks. In this case, only presenting advantages or disadvantages will result in a maximum of 5 marks rather than 6.

The focus of this question is the use of the polymers for packaging purposes, the scope of which allowed many candidates to respond with detailed and thorough answers.

(c) Polymers are widely used in packaging.

Evaluate the use of polymers for packaging.

(6)

Polymers are good for using in commercial packaging due to its light weight and durable properties which allows the product to be protected but also making sure overall product isn't heavier when the packaging is added. Furthermore, some polymers are water resistant and chemical resistant meaning ~~nothing~~ ^{the product not be} will contaminate ~~the product~~ and liquids ^{can} would be held in the packaging. It is recyclable however oil is a raw material of synthetic polymers which in production require a lot of energy and produces pollution. Even though ~~the~~ polymers are degradable it takes a long period of time to degrade so it causes problems in landfills. It can't be incinerated as it can produce toxic fumes.



ResultsPlus Examiner Comments

The candidate has offered a detailed answer which considers the advantages of using polymers for packaging such as being lightweight or water resistant. As a counter to this, there is consideration of the negative impacts of using polymers such as the long time needed to degrade. A balanced argument is put forward which has allowed the candidate to gain full marks.



ResultsPlus Examiner Tip

In order to gain full marks for an evaluation question, both sides of a discussion need to be considered. In this case it is the positive aspects of using polymers for packaging in comparison to the negative aspects such as the extraction of oil or the waste created on disposal.

Question 6 (a)

This is an 'explain' question and therefore requires three valid and different points along with a relevant (and related) explanation for each. It is not sufficient to write single word answers, or a collection of unrelated points.

The question focuses on the advantages of using desktop publishing for the design of greetings cards. Material costs and other factors which would be related to any form of computer aided designing are therefore irrelevant, as these are not specific to desktop publishing. The concept here is that DTP offers greater levels of flexibility and creativity as a range of design features are all combined into one software package.

(a) Explain **three** reasons why MDF is a suitable material for the presentation box.

(6)

MDF is much more inexpensive than normal woods, which saves the manufacturer money, decreases the cost of the product and potentially allows more money to be spent on extra finishing processes that increase the quality and aesthetic appeal of the box. MDF is also isotropic (no grain) which means it is equally strong across the whole product and is much less likely to split or crack than standard woods, increasing quality, ~~and~~ lifetime of product and protection for the jewelry. ~~Medium density fibreboard~~ Medium density Fibreboard is comparatively heavier than normal woods (due to the resin that binds it). The weight gives the impression of luxury and high quality.



ResultsPlus Examiner Comments

This candidate has been awarded full marks. They have highlighted three valid reasons why MDF has been used for the presentation box and have then gone on to expand upon these with justifications.

Lower level responses tended to focus on MDF having no grain and could therefore be painted to give an attractive finish. It was common for candidates to simply state 'it is cheap' without any comparison. For an evaluate question this is not enough detail and as such is not rewarded.



ResultsPlus Examiner Tip

Where a number of reasons are asked for in a response, candidates must make sure that they can give distinctly different answers. Often a candidate will repeat the same point several times, and as a result does not gain further marks.

Question 6 (b)

Evaluation questions require candidates to answer fully, using detailed justified responses that flow in paragraph form. Short responses for evaluation questions gain little credit.

Candidates must ensure they include reference to both advantages and disadvantages for maximum marks. In this case, only presenting one side of the argument will result in a maximum of 7 marks rather than 8.

The focus of this question is the use of the rapid prototyping using CAD/CAM in the design development stage. Many candidates did not respond correctly to the question asked, with many making reference only to CAD and the ability to produce virtual prototypes which can be tested on screen. Those candidates who did achieve high marks were the ones who focussed their response on rapid prototyping and the benefits and disadvantages for the designer of producing prototype models using techniques such as 3D printing.

(b) Evaluate how rapid prototyping using CAD/CAM assists the designer in the development of a product.

(6)

Rapid prototyping assists the designer because it allows for ~~the~~ 2D designs to be prototyped into 3D. This allows for the designer to view the product from different angles giving him/her a better understanding of the design. By having a 3D model of the design laser printed the designer is also able to conduct tests ~~on~~ on the prototype while reviewing the product. As the prototyping is a fast process the designer reduces the lead time for the product to go into manufacture because it reduces the time spent of the designer creating models. The models made using CAD/CAM are also very precise making the prototypes more reliable and assisting the designer by including small details.



ResultsPlus Examiner Comments

This is an example of a typical mid-range response where the candidate has considered the benefits of using rapid prototyping.

There are references to using a model for testing, that the nature of rapid prototyping can reduce lead times, that the models made using CAD/CAM can be very precise and that fine details can be included.

The response does not consider any negative issues and as a result would not be able to gain full marks.

A typical response which included negative issues tended to focus on the set-up costs, the training requirements for staff and similar cost-based issues.



ResultsPlus Examiner Tip

When a question asks for an evaluation, it is important that both points for and against are considered. Failure to consider both sides of the evaluation will result in candidates not achieving full marks.

Paper Summary

In the AS Graphics examination candidates need to be able to demonstrate both their knowledge and understanding of the subject along with their drawing and design skills.

Based on their performance on this paper, candidates are offered the following advice:

- Read questions thoroughly so that you understand the focus of each specific question
- Produce neat and well presented sketches and drawings which make good use of the space available
- Annotate diagrams and sketches with detailed information which adds further depth to the response
- Remember that an 'explain' question requires a valid point and a relevant (and related) explanation for each valid point made
- Give answers which include only the information which is asked for and not everything you know about the subject.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx>

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