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Examiners' Report

June 2016

GCE Design & Technology: Product Design 2 6GR02 01

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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.

Those candidates who read the question and respond with specifics relating to the topic of the question gain more marks than those who write around the subject with generic responses which have a vague link to the question topic.

It continues to be disappointing to see candidates who believe that it is acceptable to respond to all questions with generic, generalised answers, such as 'strong, fast, quick, cheap' and so on. These responses show only a basic understanding of limited aspects of the subject and therefore they can only gain low marks.

Candidates need to know the information and subject which they are being questioned about and to organise this information effectively to answer the question set, rather than write as much as possible in the space provided in an attempt to try to gain marks from their response, hoping the answer meets some aspect of the mark scheme. 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, but as additional pages continue to be used, candidates are advised to write more concisely.

Although the quality of sketching has improved since the previous series, it was disappointing to again see some very low level drawing skills evident in candidate responses where diagrams were required. Some candidates seem to be unable to transfer the skills which they have developed for their internally assessed work to examination questions.

Question 1 (a)

This question was generally answered well by the majority of candidates. The most popular response being the reference to strength or durability of the covers, or that the pages of the book were protected. Most points in the mark scheme were referenced at some stage, although only a very small minority of candidates provided responses that considered that the covers are often cloth covered, or that there is only a small binding margin. It was noticeable that some candidates generally provided answers from the first marking point on the mark scheme as opposed to two distinctly different features of the binding method.

(a) Give **two** characteristics of case binding.

(2)

1 Extremely durable as sewing and glueing takes place to connect pages to cover.

2 Aesthetically pleasing as it looks high quality and gives feeling of expense.

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Examiner Comments

The candidate has gained two marks for giving two characteristics of case bound books. In this case they have correctly noted that the books are extremely durable for 1 mark, and that the books are aesthetically pleasing for a second mark.

Furthermore, the candidate has stated that 'sewing and glueing takes place to connect the pages to the cover' which could also have been awarded one mark.

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Examiner Tip

For questions where the command verb is 'give', it is acceptable for answers to be a single word or short sentences. A linked response is not necessary, such as that shown in the example. The answers given should be distinctly different.

Question 1 (b)

This question is aimed at testing the candidates' knowledge of the properties of materials, specifically those of bond paper.

This question was a State type question where candidates were required to provide a functional property and an aesthetic property of bond paper.

This question was answered well, but some candidates demonstrated some confusion between functional and aesthetic properties.

For functional properties reference to strength/durability was the most common response. Very few mentioned "absorbs ink well" although this was often inferred in responses.

Candidate responses to aesthetic properties was more spread out between all points in the mark scheme. Most were able to name a functional property, especially those relating to strength or durability, although again there was only a minority of candidates who mentioned the watermark.

The majority of candidates achieved one or two marks, but there was some confusion amongst a small number of candidates who gave responses such as 'it can be glued'. These responses gained no credit.

(b) The pages of the book are printed on bond paper.

State **one** functional and **one** aesthetic property of bond paper that make it a suitable material for case-bound books.

(2)

Functional

It is made from rag pulp rather than wood pulp, therefore is more durable and longer lasting.

Aesthetic

It is a high quality paper with a smooth surface finish.

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Examiner Comments

The candidate has scored two marks for this response.

They have correctly stated that bond paper is durable as a functional property, and have identified that bond paper has a smooth surface as an aesthetic property. The candidate has however added further information that is not assessed, such as stating 'it is made from rag pulp rather than wood pulp' which gains no marks as this is not a functional property.

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Examiner Tip

Where headings are given, as in this question, marks are only awarded for responses which relate to that particular heading. If responses are given under the incorrect heading, generally they would not score marks.

Question 1 (c)

Often at AS Level, candidates are presented with questions that require them to 'complete a table'. These often require short responses, and for these response to be linked together in some way. The focus of this question is the use of quality control marks for printing.

The majority of candidates attempted most parts of the questions, although in some cases not all of the sections were answered. Candidates could often identify the colour/greyscale bar, with a significant proportion being able to explain the purpose of this particular quality control mark. A range of alternative names were suggested for the greyscale/colour bar, but these did not gain credit.

A large proportion of candidates also knew the name of the registration mark, although the two marks for the explanation were frequently not awarded. Where both marks were achieved, this was generally as a result of stating the symbol is used to check the alignment of the print to ensure that there is no blurring of the image.

Candidates fared less well with the crop marks, with many showing confusion between these and registration marks. Where candidates were able to recognise the purpose of the mark, only a minority were able to expand upon this with reference to the ensuring of consistency throughout the book.

Candidates often did not achieve full marks either by not providing a linked response for the 'explain' part of the question, or by giving a description of the quality control mark rather than how it is used in printing.

(c) The pages of the book are printed using offset lithography.

Complete the table below to give the name of each of the following quality control marks, and explain how they are used to improve product quality.

Quality control mark	Name	Explanation
	crop marks (1)	they're used as a guide so you know where to trim / cut the paper to ensure consistency throughout the products in the run & ensure its within tolerances. (2)
	colour bars (1)	they're used to reduce & prevent colour variation as they can be read by a densitometer to ensure consistent ink thickness / density. (2)

	registration marks (1)	they prevent bad register because if they are blurry it shows that the printing plates are not aligned. (2)

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Examiner Comments

This candidate has gained full marks for the question, by naming each of the quality control marks and then providing an explanation for each.

In this case, the candidate has given clear and linked explanations for how the quality control mark is used to improve product quality. Each explanation makes an initial point 'used to prevent colour variation' which is then expanded upon' as they can be ready by a densitometer to ensure consistent ink thickness/density'.

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Examiner Tip

When a question asks for an explanation, there should be an initial point made which is then either justified or expanded upon. Full marks cannot be achieved from making a list of individual statements.

Question 2 (a)

The first part of this question was answered with more confidence than the second part of the question. By far the most common response for the first part was reference to cutting yourself, with a relevant variety of control measures being correctly identified. Frequently candidates considered safety rulers and cutting mats, or cutting away from the hand.

There was some consideration of training by some candidates, with many candidates applying their own experiences to answer this part of the question.

Candidates found the second part more challenging, with a large proportion of vague responses which often considered sticking fingers together, getting the adhesive on clothes, or simply getting it on fingers and hands. Those candidates who achieved full marks provided suitable responses to both parts of the question; typically linking contact adhesive giving off fumes with the need for either a respirator or ventilation, or by linking skin irritation to wearing gloves.

Low level responses such as wearing a face mask gained no credit, as a face mask offers no protection against fumes.

(a) A prototype of the wallet is to be made in a school design room using a scalpel and a contact adhesive.

Complete the table by stating **one** risk and **one** control measure associated with each activity.

Activity	Risk	Control Measure
Cutting out the net	The Scalpel is sharpe and there is a risk of cutting yourself. (1)	make sure to always cut away from you & use a metal ruler for controlled cuts. (1)
Assembling the net	Contact adhesive can give off harmful fumes. (1)	Make sure the room is well ventilated and safety masks to stop inhalation of fumes are provided. (1)

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Examiner Comments

This candidate has scored four marks by providing a related risk to each activity and a suitable control measure for that particular risk. They have made some errors in their responses, such as stating 'use a metal ruler' opposed to a safety ruler. However, they have given two control measures for each of the risks, and have been awarded marks positively.

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Examiner Tip

Where questions are of this form, in this case a risk and control measure are asked for, the two responses must be linked and appropriate. No marks would be given for a control measure that did not reduce the stated risk. For example, if the candidate stated 'inhalation of fumes' as a risk, and then 'wear barrier cream' the mark for the control measure would not be awarded.

Question 2 (b)

The focus of the question is on the reasons why traditional methods are suitable for a one-off prototype and not just generic reasons for either using traditional methods or making a prototype. Candidates answered this question reasonably well but some were unable to link a description to their initial response regarding the suitability of traditional methods for a "one-off" prototype. Some responses did not contain enough specific information to award full marks or they were a list of statements.

The most popular response was reference to saving money due to not having to invest in expensive equipment such as die cutters. Fewer candidates than in previous series stated "cheaper" without some form of qualification. To gain credit for statements related to cost, there must be some valid expansion.

Other correct responses were spread across the other three answers in the mark scheme.

Where candidates did not achieve marks, they responded with reasons why the ticket wallet would be produced using traditional methods, rather than why traditional methods are used opposed to industrial processes.

(b) Explain **one** reason why traditional methods of production are appropriate for producing a one-off prototype of the ticket wallet.

(2)

traditional methods are appropriate because only one wallet is being made so ~~it~~ ~~[illegible]~~ it saves money rather than using a method such as Die cutting which would cost too much for one prototype.

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Examiner Comments

This candidate has achieved both marks available for the question. They have given a reversed interpretation of the final point on the mark scheme. This is acceptable as the points made are valid.

They have stated that traditional methods saves money rather than using a method such as die cutting which would cost too much. This links directly to 'not necessary to invest in expensive equipment (1) so saves money for a one-off product (1)'.

ResultsPlus
Examiner Tip

Responses that state 'saves money', 'saves time' are only awarded credit when there is some comparison. These are relative statements and therefore must be qualified.

Question 2 (c)

This question focusses on appropriateness of using CNC equipment for producing a batch of 1000 ticket wallets, and is in the form of an Explain which required candidates to provide a lead point and a valid justification. The term "CNC" was misinterpreted by a large number of candidates who seemed to be confused by the term despite it being explicitly stated in the specification. Where candidates scored well, the responses related to consistency of the outcome and identical products being made. Very few candidates mentioned that CNC systems have quality checks built in.

Those candidates who performed less well either provided a list of low level responses, gaining only 1 mark, or made reference to the system counting and producing only the number required, which indicated the confusion with regard to the term 'computer numerical control'.

(c) A batch of 1000 ticket wallets is required for a concert.

Explain **one** reason why CNC (computer numerically controlled) production methods are appropriate for batch production.

(2)

CNC software will allow a large amount of nets to be placed on one sheet allowing no waste of material and CNC ensures all measurements are accurate and the same.

ResultsPlus
Examiner Comments

Whilst it was a common response from candidates to link the consistency of CNC equipment to producing a batch of identical wallets, only a small number of candidates provided responses similar to this one.

One advantage of using CNC equipment is the ability to tesselate the nets at the design stage, as indicated by this candidate. This in turn reduces the amount of material wastage. This response gains both of the marks available, linking with the 5th bullet point on the mark scheme.

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Examiner Tip

Centres are reminded that for explain questions, in order to gain all of the marks available, there must be a linked response given. This would consist of an initial statement and a subsequent expansive comment which either offers greater depth or a justification for the point made.

Question 2 (d)

This question asks candidates to Explain two reasons why screen printing is suitable for batch production. There were some good responses from candidates who were able to link the lower set up costs associated with screen printing to the lack of a need to produce plates that would be required for alternative methods and the subsequent cost-effectiveness when producing only a limited batch of products. The focus of the question was on the batch size, and although a large proportion of candidates did state that screen printing was suitable for two colour printing, this only gained credit when it was linked to the batch size.

Some candidates gained marks for reference to the flexibility of the process, stating that screens can be produced easily, are adaptable, and can be reused.

Some candidates did not expand their responses or gave responses that were not pertinent to the question and therefore received lower marks.

A significant proportion of candidates who did not achieve marks provided descriptions of the screen printing process or gave generic advantages of the process.

(d) A two-colour design will be added to the ticket wallet using screen-printing.

Explain **two** reasons why screen-printing is a suitable method for batch production.

(4)

One ~~Fis~~ reason Screen-printing is Suitable for batch production is that it is a cost effective process Compared to offset-lithography, as expensive printing plates do not need to be made. Another reason is that it is a flexiable process - which is good for a production that does not last long; This means a few ~~Stencils~~ Stencils can be made and used and then the Screens can be re-used after productio for something else.

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Examiner Comments

This response has achieved four marks.

The candidate has stated that screen printing is cost effective compared to offset-lithography, with an expansion indicating that printing plates are not needed. This is an appropriate linked response for 2 marks.

A further two marks are awaded for stating that the process is flexible, meaning that screens can be reused. This response is not directly from a single bullet point on the mark scheme, rather it is a combination of points which are nonetheless related.

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Examiner Tip

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

Question 3 (a)

This question focussed on the process of producing a sign from GRP and asked candidates to use notes and sketches to describe the process. Candidates generally performed poorly on this question, with many showing a lack of knowledge of the process of producing a product from glass reinforced plastic. This is an area of the specification that has previously been assessed, but many misconceptions were evident in responses.

Where candidates achieved well, they provided detailed diagrams with annotations or supporting notes to describe how the sign was made by first producing a mould and then the laying up process for producing a GRP product. Some candidates described a spray approach which was also valid.

Common incorrect responses either indicated that a sheet of GRP would be laser cut or vacuum formed, or that the plastic and glass are melted and injection moulded into a former.

3 Figure 3 shows a sign produced from glass reinforced plastic (GRP).

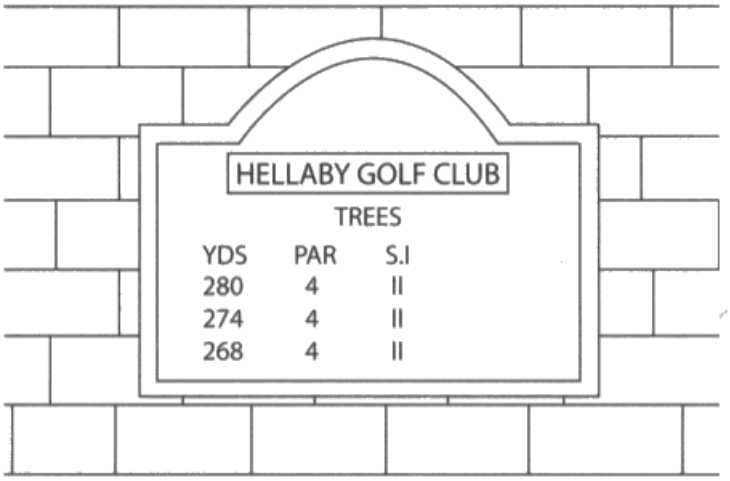
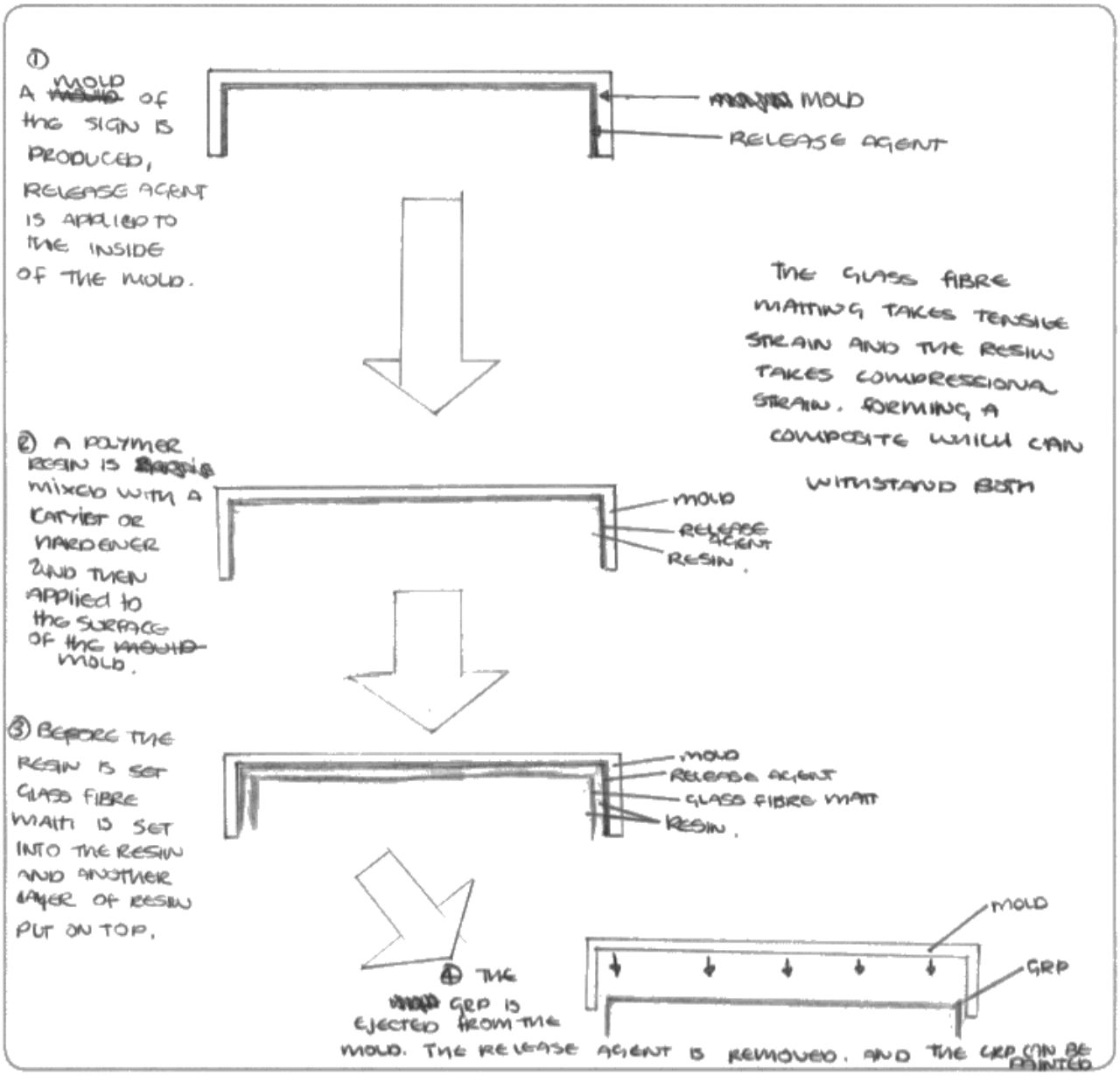


Figure 3

(a) Using notes and sketches, describe how the sign would be produced from glass reinforced plastic (GRP).

(4)



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Examiner Comments

This candidate has gained full marks for their use of notes and sketches to describe how the GRP sign could be produced. They have identified a range of key features of the process, such as the production of the mould, the addition of a release agent, the addition of layers of glass fibre matting and resin, and the building up of layers to an appropriate thickness.

The candidate has made some errors in their descriptions, but they have demonstrated sufficient understanding of the process to achieve four marks.

ResultsPlus
Examiner Tip

If a question asks for notes and sketches, a candidate's answer should include both notes and sketches to achieve full marks.This particular candidate has used annotations effectively to describe the process of producing the sign. The stages are clearly indicated, with the notes and sketches complementing each other to provide an appropriate level of detail.

Question 3 (b)

This is an Explain question, where candidates were expected to respond with one advantage and one disadvantage of using epoxy resin for joining two components together. As an Explain question, an initial statement and a related expansive comment are required for each in order to gain full marks.

A large proportion of candidates knew that epoxy resin has good strength, is able to bond different materials, and gives a long life to the product. Many linked this with weather resistance, although a significant proportion of candidates also indicated that there was a lack of weather resistance in the disadvantage section.

Very few candidates stated that rapid setting versions were available. There was a good range of generally good answers for the disadvantages, but none mentioned the need to mix the proportions accurately in order for the adhesive to perform to specification.

Common disadvantages included the slow setting time and subsequent need to support the holder until set, or the health and safety issues associated with the use of an epoxy resin.

Some candidates tended to achieve only two marks by identifying an advantage or disadvantage, as opposed to explaining one or the other.

(b) An acrylic leaflet holder is to be attached to the sign using epoxy resin.

Explain **one** advantage and **one** disadvantage of using epoxy resin for attaching the leaflet holder to the sign.

(4)

Advantage

Epoxy resin is incredibly strong, and once it has set, it is also weather proof allowing the sign to be outside is needed and it will be durable and long lasting.

Disadvantage

Epoxy resin can be difficult to work with due to long drying times and the fact that it releases ~~fa~~ dangerous fumes. This means that appropriate sagety measure must be used such as correct ventillati and a mask.

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Examiner Comments

This candidate has correctly identified an advantage and a disadvantage of using epoxy resin for the sign. Each has been expanded upon with a suitable statement of qualification. The responses given here are typical of those provided by candidates, many of whom provided more than one advantage and disadvantage.

For disadvantages, the candidate has initially noted the long drying time but has not qualified this. They have then stated that 'it releases dangerous fumes' linked with the need for ventilation. In this instance, the first response was not considered, and the candidate awarded two marks for the latter part of the response.

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Examiner Tip

For explain questions, full marks cannot be achieved by providing a list of statements that have no expansion or justification.

Question 4 (a)

This question focussed on the advantages of using electroluminescent lighting for advertising displays. As an Explain question, candidates were again expected to provide a valid lead point supported by a valid justification.

There were some good responses but only a small proportion of candidates achieved full marks. Most candidates understood that it is a low energy light, with an associated justification, whilst others either considered it was either thin or waterproof.

Some candidates thought this type of lighting was solar powered, and therefore no marks could be awarded. It was also common to mix it up with phosphorescent lighting, with responses stating that light energy is stored during the daytime.

A minority of candidates offered generic responses for illuminated signage, such as 'can be seen in the dark', or 'can be turned on or off'', which gained no credit.

4 Illuminated advertising displays are designed for both internal and external use.

(a) Explain **two** advantages of using electroluminescent lighting for advertising displays.

(4)

Electroluminescent lighting comes in very thin strips and therefore will be able to fit into small spaces such as the advertising displays. ~~The~~ Electroluminescent lighting also emits light in all directions which means that the advertising display is visible from all angles, wherever you look at it.

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Examiner Comments

This candidate has provided a concise response which links the thinness of the panels to their ability to be used in small spaces. This relates to the 7th bullet point on the mark scheme. They have also stated that the light is emitted in all directions, meaning it is visible from all angles. This relates to the 1st bullet point in the mark scheme and is appropriate for the award of two marks.

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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. This tended to consider generic reasons for illuminated advertising displays as opposed to the advantages of using electroluminescent lighting.

Question 4 (b)

The specification lists numerous materials and processes, some of which may be commonly used in schools, whilst others may be more frequently found in industry. This question requires the candidates to have knowledge of one of these materials, such as polypropylene.

This question focussed on the reasons why polypropylene is an appropriate material for the outer casing of an advertising display that uses electroluminescent lighting, rather than simply the properties of polypropylene. Again a linked response was required, with an extended answer focussing on the application of polypropylene for advertising displays.

This question was answered well with a range of responses being given by candidates. The most popular responses referred to chemical/water resistance, toughness/durability and transparency with good understanding being shown through the expansions of these statements.

Candidates who did not expand on their intial statements were limited to 1 mark.

(b) The outer casing of advertising displays can be made from polypropylene (PP).

Explain **one** reason why polypropylene is an appropriate material for the outer casing of advertising displays.

(2)

It is available in various different colours meaning the designer can pick a colour best suited to the brand who is advertising.

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Examiner Comments

A small proportion of candidates considered the advertising display holistically. In this instance, the candidate has correctly identified that polypropylene is available in a wide range of colours, and has expanded upon this by stating that this could link to the corporate identity of the brand being advertised.

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Examiner Tip

When a question asks for reasons why a material is suitable for an application it is important to ensure that the identified qualities of the materials have a direct relationship to the application.

Question 4 (c)

This question focusses on the injection moulding process, with candidates being asked to produce an annotated sketch to describe the process.

The question required more than a simple labelled diagram in order to achieve full marks.

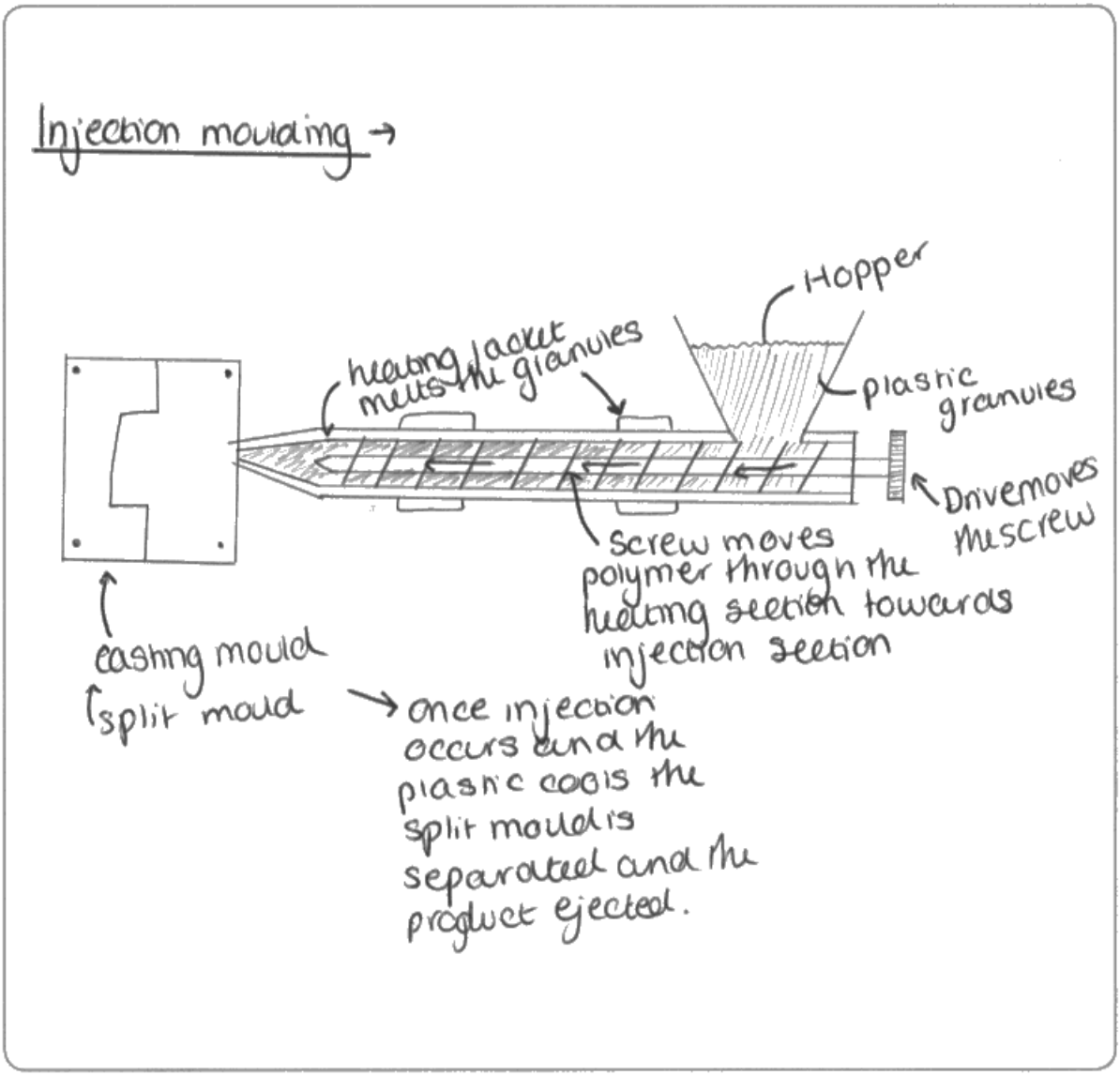
This was generally very well answered, with the majority of candidates showing an understanding of the injection moulding process and therefore gained the full 5 marks. There were some good descriptions involving the purpose of the Archimedes' Screw and good diagrams with either detailed labels explaining the steps or step by step descriptions written supported by a range of diagrams. Quite a few candidates did not mention any 'screw' of any type, either in diagram or in process, and at times renamed this inappropriately with terms such as 'drill'.

Where candidates did not achieve full marks, they either did not identify the importance of the Archimedean Screw, or missed individual features such as forced cooling, split mould or did not mention the melting of the polymer.

(c) The outer casing of an advertising display is produced using the injection moulding process.

Using annotated sketches, describe the injection moulding process.

(5)



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Examiner Comments

The candidate has provided a very clearly drawn diagram to explain the process.

The Archimedean screw is clearly evident, granules are indicated as being placed in the hopper, there is an explanation of the purpose of the screw, annotation states the polymer is melted, and there is an explanation of the split mould.

This is an acceptable approach for an annotated sketch, where the candidate has provided more than simple labels.

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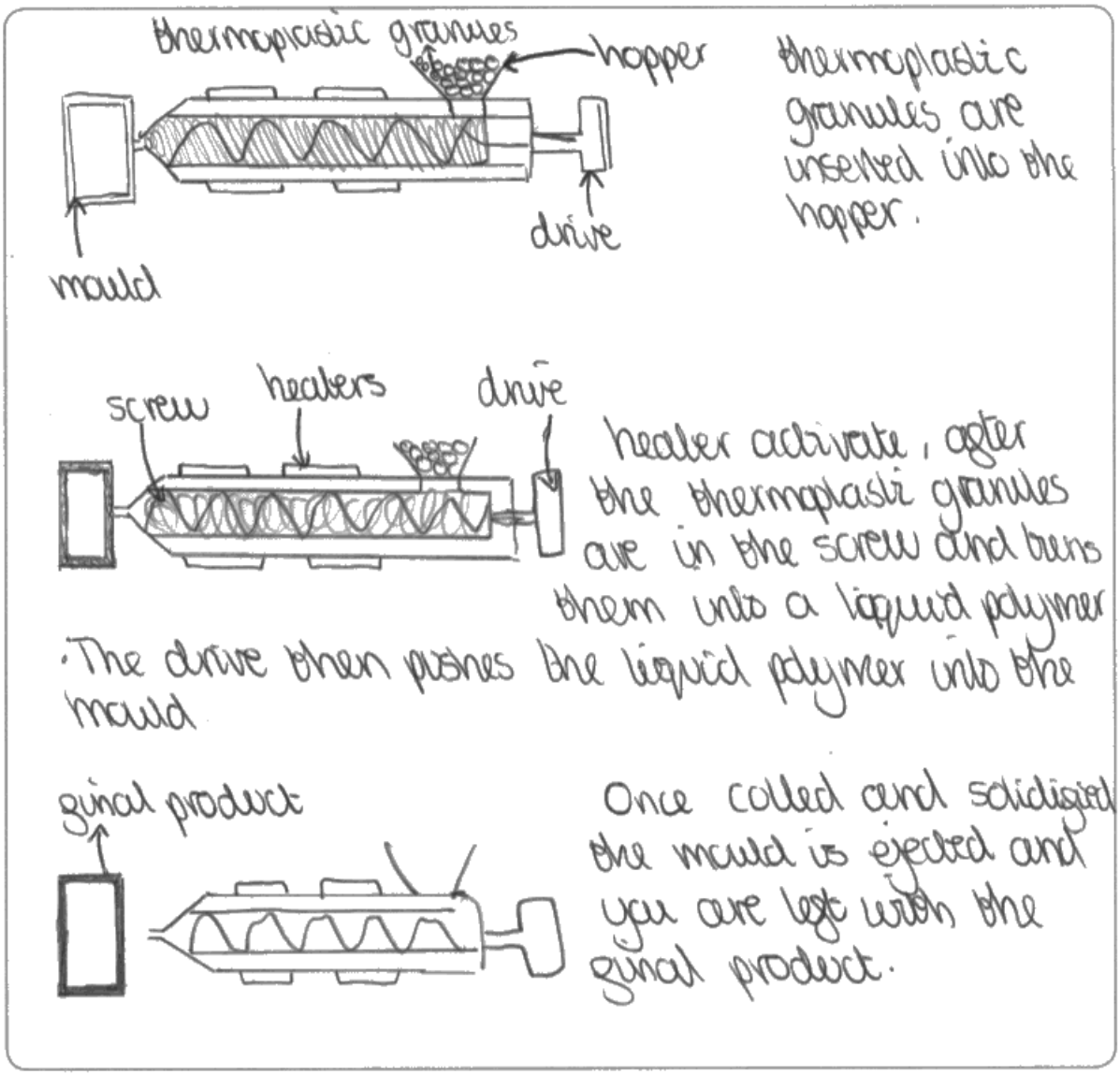
Examiner Tip

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.



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Examiner Comments

This response takes an alternative approach of showing sketches of various stages of the process. As with the other example, there are five clear aspects of the process indicated.

Although the Archimedean Screw is not named in full, it is clearly indicated in the sketches, therefore credit can be given.

Question 5 (a)

The purpose of this question is to examine the candidates' ability to interpret a given drawing and then to present the information in a different format. In this case, the question focusses on producing a plan view from a given planometric drawing of a room.

Candidates were expected to interpret the information, and then produce an accurate sketched plan view of the bedroom.

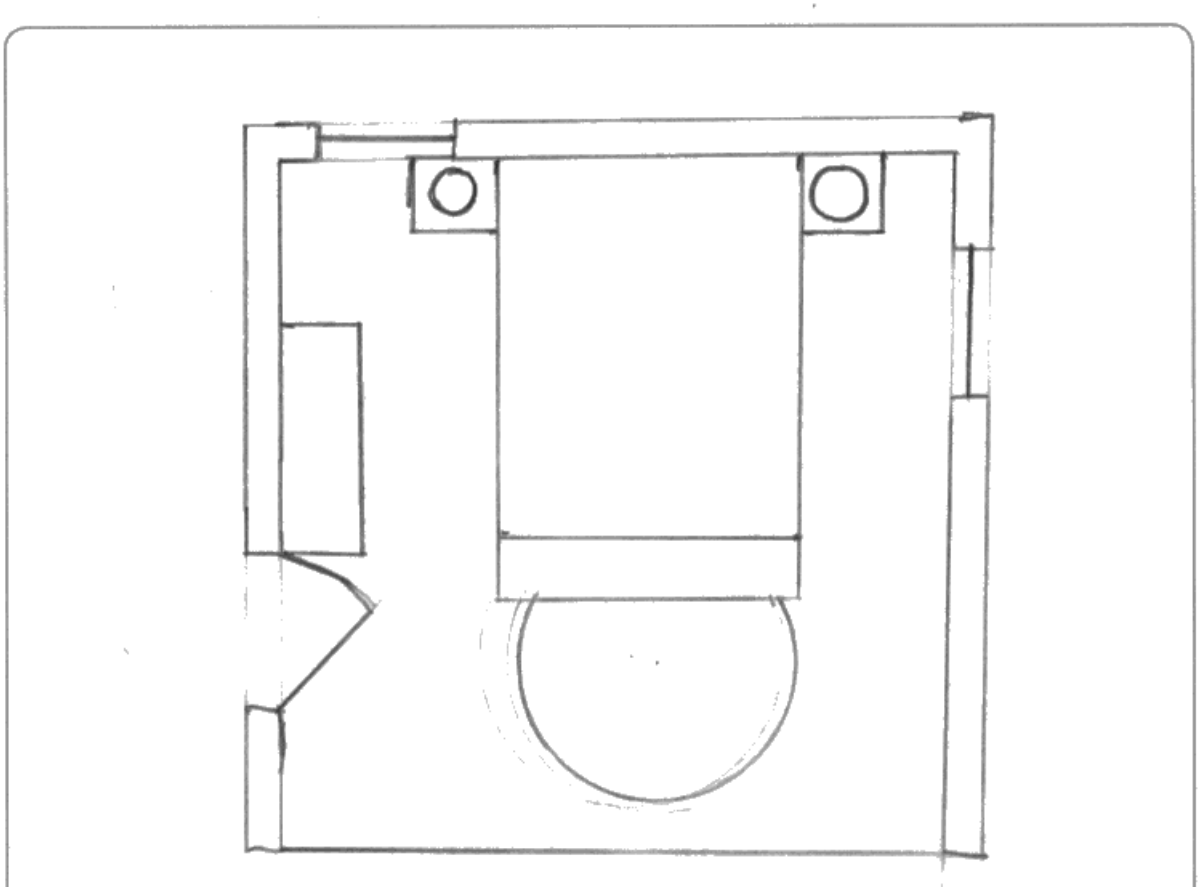
This was generally answered well by most candidates. Where candidates did not achieve full marks, this was as a result of not showing any thickness to the walls, a lack of indication of the windows and door, or by drawing individual features either out of proportion or inaccurate shapes.

This was a very well answered question most of the time achieving high marks, with most candidates achieving 5 or 6 marks depending if they showed the double wall or windows.

It was noted that the standard of drawing has improved compared to the previous series and that the majority of candidates could interpret the planometric view effectively.

(a) In the space below, produce a plan view of the bedroom.

(6)



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Examiner Comments

This response is typical of that produced by candidates. The walls show a thickness, with the windows and door in approximately the correct locations.

The contents of the room are drawn in the correct locations, and in the correct proportions. The response is clearly presented, and makes effective use of the space available for the answer.

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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.

Question 5 (b)

This question focussed on why planometric drawings are used for producing pictorial views of rooms rather than isometric.

As an Explain question, candidates were required to give a valid lead point then give a valid justification reason. This question was not answered that well by a large proportion of candiates, although those with an undestanding of the difference between the two techniques knew that dimensions are the same, and that circles are drawn as circles rather than ellipses. The better answers made reference to the 45/30 angles correctly in their answers. Very few candidates considered that it is possible to produce a planometric drawing directly from a plan view. Some candidates were unable to expand on their initial comment in order to compare or contrast the two techniques.

(b) Explain **one** reason why planometric (axonometric) drawings are used, rather than isometric drawings, for producing pictorial views of rooms and buildings.

(2)

Circles aren't warped so are drawn as they are, whereas in isometric drawings they are drawn as ellipses which can make it looked more warped therefore making it less accurate and representative of the actual room.

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Examiner Comments

Whilst not exactly representing the statements in the mark scheme, this candidate has gained two marks for stating that circles are not warped and are drawn as they are, compared to ellipses in isometric. This level of detail is appropriate for the award of both marks available for this question.

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Examiner Tip

This is a concise answer in which the candidate presents their response logically. Answers such as this demonstrate the knowledge of the candidate clearly.

Question 6 (a)

This is an Explain question and therefore requires a valid point and a relevant and related explanation for each of the two reasons given. 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. This question focusses on the reasons why sizing agents are used during the drying stage of paper production.

This question was not answered particularly well. Many candidates made reference to sizing agents being directly linked to the size/thickness of the paper, which was a common misconception.

The good answers were mainly about strength enhancement, but few took this further and explained that this is due to it resisting water absorption. A further, less popular approach, were answers about sizing agents being used as an adhesive.

It was very clear that the majority of candidates were unaware of this part of the specification. Very few candidates gained full marks in this section.

6 Paper and board are produced from wood pulp.

(a) Explain **one** reason why sizing agents might be used during the drying stage, when producing paper using the Fourdrinier process.

(2)

sizing agents may be used in the drying stage of the fourdrinier process to prevent feathering inks or warping of paper making it more water resistant.

PROS	CONS
* sustainable	* small fibres - sizing agents + bleach
*	* NOT recycleable

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Examiner Comments

The candidate has gained two marks for linking the prevention of feathering of ink to the increased water resistance of paper. Although there are some additional statements made, the reponse is nonetheless appropriate for the award of both available 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 related to the use of waste pulp for the production of paper will result in a maximum of 7 marks rather than 8.

The most popular answers for advantages were: less deforestation, reduced amount of waste to landfill and less chemicals/less energy needed. In the disadvantages popular answers included: less strength, lower grade paper, virgin pulp needs to be added, lower quality.

This question was answered quite well, with many candidates demonstrating a good understanding of using waste pulp, but few achieved full marks. This tended to be as a result of candidates offering repetitive responses, over explanation or a description of the process of producing waste pulp.

*(b) Evaluate the use of waste pulp for producing paper.

(8)

Waste pulp comes from recycled paper which is a sustainable resource as it reduces the amount of waste going to landfill & also reduces the need to deforest more trees to create new virgin fibres. However, it must be combined with virgin fibres to produce paper of a good quality. It can be recycled after use, but only a limited number of times as the fibres start to degrade which makes them unsuitable for paper production. It is biodegradable and chlorine free so is better for the environment than chemical & mechanical pulp. It is also much cheaper than them as it is made from waste products. Having said this, it does require equal amounts of energy to produce as chemical and mechanical pulp so is actually not that much more sustainable than them, and it produces paper of a lower quality with a speckled surface so is not suitable for high-end uses. The pulp requires

multiple additives & starches in order to get the paper to a high enough quality to sell, further ~~reducing~~ increasing its environmental impact. It's hard to print onto due to rough surface.

ResultsPlus
Examiner Comments

This is one example of a response that achieved full marks. The candidate has indicated as advantages:

- pulp is from a sustainable source
- this reduces waste going to landfill
- reduces the need to deforest more trees
- it is chlorine free, which means less chemicals

and for disadvantages:

- must be combined with virgin fibrres
- can only be recycled a limited number of times
- requires equal amounts of energy to produce
- produces paper of a lower quality

The response is balanced and contains further points that could be awarded marks.

ResultsPlus
Examiner Tip

When a question asks for an evaluation, it is important that both points for and against are considered. Candidates will not achieve full marks, unless both sides of the evaluation are considered.

Question 7

This question tests the candidates' wider knowledge of types of computer aided design, focussing on a comparison between wireframe CAD modelling and CAD surface modelling.

This is a Discuss question and therefore for full marks to be awared, a balanced discussion must be put forward. If only one side is presented, candidates could achieve a maximum of 7 marks.

A small proportion of candidates gained over 5 marks.

Far too often a basic description of CAD was given with no or only slight reference to Wire Frame or Surface Modelling given. Some candidates presented responses that were reasonably well written but often confused. Common responses for wire frame modelling were: difficult to understand, showing the structure/skeleton of the model, unrealistic. Most common were: more realistic, outer surface or skin shown for Surface Modelling.

*7 Discuss the use of both CAD wire frame modelling and CAD surface modelling when presenting design concepts to potential clients.

CAD wire frame modelling can be potentially the most confusing of all types of CAD modelling. This is due to all hidden lines being visible and so could be diffficult, especially for a client who may not have any experience or ~~understand~~ understanding of modelling, to understand. CAD surface modelling will give the client a better understanding of how the product is going to look, this is due to the ability to add surface graphics, colour and texture to the model. CAD wire frame is suitable for intial designs as it is easy to change and up date, where as surface modelling might be better suited later on in the design stage due to it being ~~an~~ more difficult ~~to~~ to change due to the time it takes to render the model. CAD ~~wire~~ wire frame ~~[illegible]~~ ~~[illegible]~~ and CAD surface modelling are both

excellent ways of showing concepts to potential clients, they reduce the cost of using protyping methods as the CAD image can be moved and seen at all angles so initial ~~proble~~ problems can be immediatley spotted.

ResultsPlus
Examiner Comments

This response has achieved 6 marks.

The candidate has considered the following for wire-frame modelling:

- the most confusing of all types of CAD modelling
- hidden lines are visible
- difficult to understand

and for surface modelling:

- gives the client a better understanding of how the product is going to look
- ability to add colour
- time it takes to render the model

The response is logically presented, and although considers some generic advantages of CAD, the majority of the response is pertinent to one or other of the techniques being examined.

ResultsPlus
Examiner Tip

When a question asks for a discussion, it is important that both points for and against are considered.

Both sides of the discussion need to be considered to gain full marks.

Paper Summary

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.
- Use the drafting skills which have been developed for internally assessed work to answer questions which involve sketching or drawing.
- Remember that an 'explain' question requires a valid point and a relevant and related explanation or expansion for each valid point made.
- Remember that an ‘evaluate’ question must include references to both cases, be balanced, and offer a conclusion.
- 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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