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Examiners' Report
June 2015

GCE Design & Technology 6RM02 01

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Introduction

This examination counts for 40% of the AS and 20% of the A2 qualification. It is now well established, and centres are preparing candidates well for the challenges of the paper. There is clear evidence of good examination technique being taught by centres and used by candidates in their responses, which is encouraging to see. There was also evidence of better quality sketches and less illegible handwriting. A notable issue this year was the number of vague answers that did not contain sufficient detail to be worthy of marks. Many of these responses contained words such as 'easy', 'effective' and 'efficient'. These words allude to points in the mark scheme but they can be interpreted in a number of different ways, and where there was no further detail given, marks were not awarded. Candidates are encouraged to communicate detail in their responses making clear points and justifying them where needed.

Question 1 (a)

The majority of candidates correctly identified the hacksaw as the appropriate manual saw. There was also a wide range of alternative responses that didn't score marks, these included tenon, coping, hand and jig saws.

Question 1 (b)

Less than 50% of candidates named a correct metal to make the saw blade from, which is concerning. Aluminium, stainless steel, mild steel, iron, and steel on its own were common but incorrect answers.

(b) Name a suitable metal from which to make the blade of the saw.

(1)

~~ste~~ steel

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Examiner Comments

Steel on its own was not acceptable as candidates for this level of qualification are expected to have a sound knowledge of the different types of steel and their uses.

Question 1 (c)

A straightforward question although many found it challenging. A significant minority of candidates failed to gain full marks due to superficial responses. Answers that made simple statements about heating and cooling were not accepted. Candidates should be aware that a specific temperature or state needs to be reached, and a specific cooling rate has to be achieved for the process to have a hardening effect on the metal. A minority of candidates confused the required process with case hardening, work hardening and plating.

(c) The blade of the saw will be hardened during manufacture.

Describe the process of hardening the blade.

(2)

The blade should be heated up to 875°C, then quenched in cold water

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Examiner Comments

This response gained the full 2 marks as it states an appropriate temperature for the heating stage, and the reference to quenching clearly shows an understanding of the need to cool the metal quickly.

(c) The blade of the saw will be hardened during manufacture.

Describe the process of hardening the blade.

(2)

The blade will be heated and using a hammer it will be hammered. Then once it is cooled it will be hardened and therefore stronger.

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Examiner Comments

No marks were awarded for this response as the candidate has confused this process with work hardening. The candidate has communicated no clear knowledge about how a saw blade is hardened, even though the response does mention both heating and cooling.

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Examiner Tip

Candidates must be detailed in their answers. Superficial responses will rarely get good marks, and in many cases will not be awarded any.

Question 1 (d)

Candidates found this follow-on question just as challenging, although the majority still scored 1 or the full 2 marks. Many candidates did not have a sound understanding of hardness. This was illustrated by responses that stated 'tempering was needed to make the blade stronger'. Similarly, responses that focused on 'tempering made the blade cut better' were also misdirected, as tempering will reduce the hardness slightly, rather than increase it.

(d) After hardening, the blade needs to be tempered.

Explain why tempering is necessary.

(2)

After hardening the blade is brittle, by tempering, the blades toughness is improved so its is it won't snap or bend as easily.

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Examiner Comments

A very good answer which shows a sound understanding of why tempering is needed.

(d) After hardening, the blade needs to be tempered.

Explain why tempering is necessary.

(2)

Tempering is necessary so that it removes the brittleness from harelening the blade, which allows the blade to cut through softer materials.

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Examiner Comments

This response was awarded 1 mark for recognizing that tempering removes brittleness, but this is then incorrectly related to hardness rather than toughness.

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Examiner Tip

A sound understanding of material properties is essential at this level of qualification, and candidates are expected to be very clear on the differences.

Question 1 (e)

Very few candidates scored the maximum 5 marks for the risk assessment steps. Most candidates clearly understood the broad concepts involved and could readily state the steps involved with identifying risks and putting control measures in place. Some went further and included identifying who is at risk. Few stated the need to evaluate the risks or record the risk assessment. A number gave 'evaluate the risk assessment' as the last step in the sequence, which is a sensible guess, but in effect it just means that you would do the steps again. Another common incorrect answer was to identify 5 control measures only.

(e) Before any manufacturing processes are carried out a risk assessment must be completed.

Outline the **five** steps involved in a risk assessment.

(5)

1 Recognise the ~~hazzard~~ risk (hazzard)

2 Evaluate the likelyhood of risk

3 Understand who is at risk

4 Plan cantrol measures to avoid the risks

5 ~~Use control measures~~ Put control measures into place to prevent risk

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Examiner Comments

A good response that gained 4 of the 5 marks available. The candidate has split step 4 into two parts which gains 1 mark only.

(e) Before any manufacturing processes are carried out a risk assessment must be completed.

Outline the **five** steps involved in a risk assessment.

(5)

1 Make sure all personal protective equipment is used such as necessary gloves, apron, goggles, mask

2 Make sure working area is uncluttered and nothing can interfere with the machine / tool / machine wires.

3 Make sure all appropriate guards are down before machine is turned on

4 Make sure to have no distractions and all peers remain behind the marked safety lines

5 Make sure emergency stop button is located and in reach incase of an accident or need to stop the machine

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Examiner Comments

A weak but not uncommon response simply listing control measures. These types of responses were awarded 1 mark.

Question 2 (a)

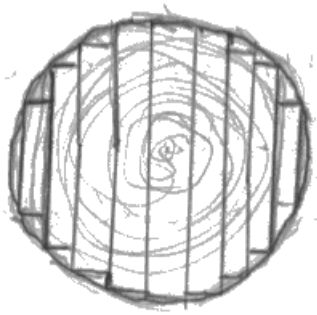
Almost all candidates correctly sketched a through and through conversion diagram, although quarter sawing was more challenging. Although the majority were correct a large minority sketched incorrect sawing patterns in the quarters. A small number simply showed a quartered log.

2 (a) After a tree has been felled, it needs to be converted into planks.

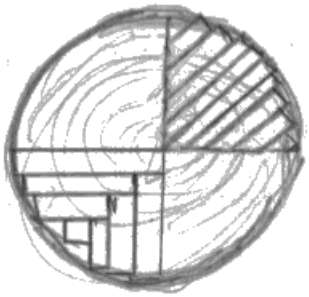
In the boxes below draw a diagram of a through and through (slab) sawn log and a quarter sawn log.

(2)

Through and through (slab) sawn



Quarter sawn



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Examiner Comments

A well sketched answer with two correct sawing patterns shown for the quarter sawn log. Either quarter could have been awarded the mark.

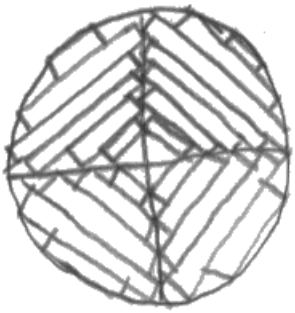
2 (a) After a tree has been felled, it needs to be converted into planks.

In the boxes below draw a diagram of a through and through (slab) sawn log and a quarter sawn log.

(2)

Through and through (slab) sawn

Quarter sawn



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Examiner Comments

This response shows a correct through and through diagram but an incorrect quarter sawn pattern. The sawing pattern shown will produce planks, all of which are likely to warp.

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Examiner Tip

When revising, do not just look at diagrams in books, draw them on paper. If the first time you draw a diagram is when you draw it on an exam paper, you are likely to get it wrong. Drawing it out as part of revision makes you look at it much more carefully and it becomes much easier to remember.

Question 2 (b)

Most candidates were able to pick up 2 to 4 marks on this question by giving two advantages and justifying them. Common mistakes included stating that slab sawing made longer planks. The candidate may have meant wider, but where this was not made clear so no mark was awarded. 'Wider planks can be used for more purposes' is also incorrect as timber can be edge jointed. Where candidates used 'less edge jointing required' as a justification, this was awarded. A significant number of responses included the 'easier, effective, efficient' terms which are too vague and failed to gain marks. Marks were not awarded for stating that slab sawing is more profitable. It may be cheaper to do, but the wood is less valuable and so it is not necessarily more profitable than quarter sawing.

(b) Explain **two** advantages of through and through (slab) sawing over quarter sawing.

(4)

1 Through and through (slab) sawing is a cheaper method of sawing wood. This will reduce the money spent of converting the wood into planks. Slab sawing is cheaper than quarter sawing.

2 Slab sawing is a faster method of converting the wood into planks compared to quarter sawing. Therefore the time spent on converting the wood into planks is reduced.

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Examiner Comments

This response is an example of where a candidate has made a correct point and justified it with the same point. They have done this for both 'cheaper' and 'faster'. Only 2 marks were awarded.

Question 2 (c)

Fewer candidates were able to give a valid advantage and justify it for this question. Many scored 1 mark for knowing that it will warp or cup less, but many simply stated that this was due to the grain pattern. This was too vague for the second mark as a specific description of close grain, short grain or perpendicular grain was being looked for which would show a clear understanding of why it didn't cup. Some successful candidates communicated this with diagrams. Only a minority of candidates scored both marks using the aesthetics point.

(c) Explain **one** advantage of quarter sawing over through and through (slab) sawing.

(2)

The planks are less likely to cup and twist due to the shorter cross-grain, making them easier to sell at a higher price to customers as they are of higher quality, which increases profits.

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Examiner Comments

The full 2 marks were awarded for this clear response which covered all 3 of the marking points in the mark scheme.

(c) Explain **one** advantage of quarter sawing over through and through (slab) sawing.

(2)

One advantage of quarter sawing over through and through sawing is that their is less waste wood. This means that most of the wood is usable, making the process more sustainable.

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Examiner Comments

This response was unfortunately quite common and shows no clear understanding of the advantages or disadvantages of quarter sawing.

Question 3 (a)

A question that stretched many students. Many were able to comfortably identify 3 further properties other than strength and good aesthetics which were given to candidates in the stem, but 4 and 5 properties became difficult. As such it was a good measure of candidates' knowledge and their ability to apply it to an unfamiliar situation. Corrosion resistant and light-weight were the most popular answers, although all those in the mark scheme were used. Common answers that were not awarded were 'ductility' and 'good conductor', as these are not needed for the sprocket and crank arm shown. There continues to be a large number of invalid answers that simply repeat the two already stated in the stem, or use alternative versions of them. For example 'tensile strength,' 'compressive, strength' rigid' and 'will not bend' are all versions of the given 'strength'.

3 Figure 2 shows a bicycle sprocket and crank arm made from duralumin.

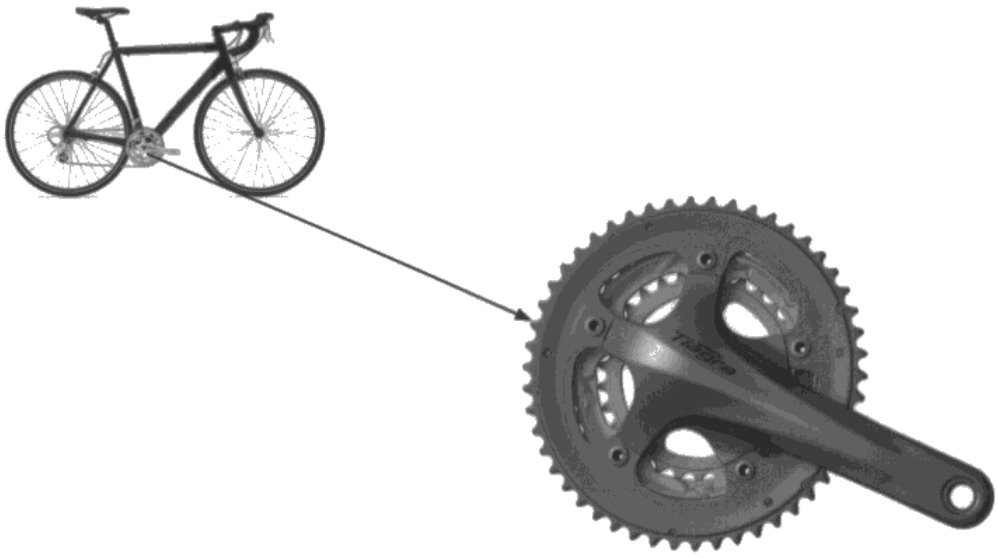

Figure 2

Two properties of duralumin are strength and aesthetics.

(a) State **five** further properties of duralumin that make it suitable for this application.

(5)

1 it is hard

2 it is tough

3 it is not brittle at all

4 when heated it is malleable.

5 high compression strength.

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Examiner Comments

This response contains some common mistakes. The third answer is simply a description of the second answer and is therefore a repeat. The final answer is invalid as it is stated in the question stem, and candidates are asked to identify further properties other than strength and aesthetics.

3 Figure 2 shows a bicycle sprocket and crank arm made from duralumin.

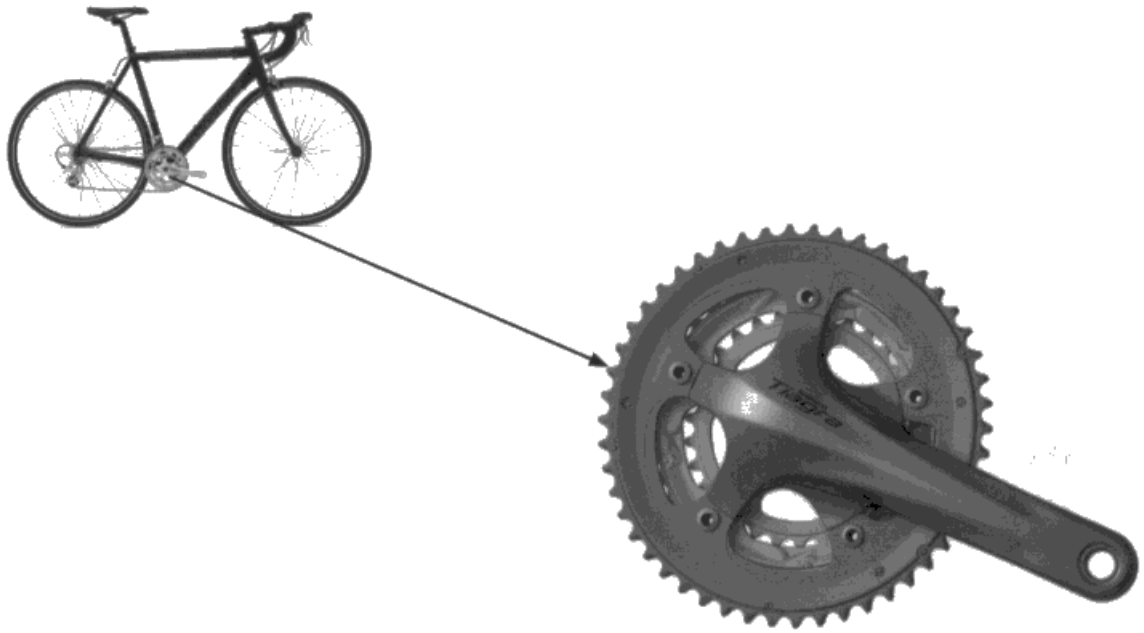

Figure 2

Two properties of duralumin are strength and aesthetics.

(a) State **five** further properties of duralumin that make it suitable for this application.

(5)

1 It is corrosion resistant.

2 Tough

3 Easily machined to create this shape.

4 Durable.

5 Malleable

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Examiner Comments

A top response gaining the full 5 marks.

Question 3 (b)

There are a wide range of quality control checks that can be performed on the sprocket and crank arm during production, and most candidates were able to outline 2 or 3 successfully. The most common error was to repeat checks or to use the invalid one given in the stem. For example candidates described checks to establish that holes were in the correct place, or that there are the correct number of teeth on the sprocket. Both of these are dimensional checks and are therefore invalid.

(b) One quality control test that would be used during volume production of the sprocket and crank arm is to check dimensional accuracy.

Outline **three** further quality control checks that could be carried out on the assembled sprocket and crank arm.

(3)

1 Check all teeth are intact and have not broken off.

2 Check it has been fastened properly and the rivets/ fabrication method are not coming loose, and that they are aligned properly.

3 Ensure the surface finish is smooth and to a specific standard - No scratches, and no rough areas.

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Examiner Comments

A good response that gained the full 3 marks for a breakage check, an assembly check and a surface finish check.

(b) One quality control test that would be used during volume production of the sprocket and crank arm is to check dimensional accuracy.

Outline **three** further quality control checks that could be carried out on the assembled sprocket and crank arm.

(3)

1 Wear and ~~tear~~ tare: Have the device used for a long period of time to see how reliable it will be in the future.

2 Friction: use the device for a long duration of time to see how much friction is produced which could lead to heat building up or wear and tare

3 Apply some strength tests to ~~skee~~ see if the device can hold up against constant use ~~with~~, in varied conditions and ~~stress~~ under stress

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Examiner Comments

This response was awarded 1 mark as all three tests are destructive tests to check the quality of the material. As such the candidate has not shown a range of knowledge concerning quality control tests.

Question 4

On the whole a well answered question. Many students had reasonable knowledge of cams and consistently scored 3 or 4 marks. The snail cam was answered correctly most often, with the eccentric least often. Some of the better responses identified specific parts of a mechanism as a use for a pear cam, such as 'operating valves', with weaker answers being 'an engine'. Both were acceptable although vague answers such as 'machines' or 'vehicles' were not. A minority of candidates had no knowledge of cams at all and clearly had not studied this specification topic.

4 Cams are used in a range of situations.

Complete the missing information in the table below, giving different responses to those already shown.

Name	Diagram	Characteristic	Appropriate use
Eccentric	 (1)	Causes the cam to move up and down (1)	Fuel pumps
Pear (1)		Causes follower to dwell for part of its (the cam's) rotation.	Fair ground rides (1)
Snail		Causes the cam to gradually get higher ~~teller~~ then drop down	Toys/automata

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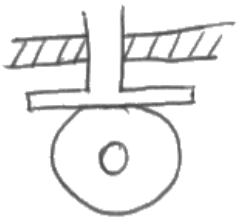
Examiner Comments

This response has 5 good answers. The characteristic given for the eccentric of 'moves up and down' is too basic for a mark as this could be stated for all of the cams. Candidates need to give appropriate detail in their responses.

4 Cams are used in a range of situations.

Complete the missing information in the table below, giving different responses to those already shown.

Name	Diagram	Characteristic	Appropriate use
Eccentric	 (1)	is not very accurate, does not follow hollows flat or inclan (1)	Fuel pumps
pear (1)		Causes follower to dwell for part of its (the cam's) rotation.	Childrens toy. Bob at car with a man inside that bobs up and down a (1)
Snail			Toys/automata

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Examiner Comments

Only a single mark was awarded for 'pear' in this response. The candidate has drawn a wheel rather than an eccentric cam and has given a characteristic of the flat follower drawn rather than the cam. The candidate also gave an invalid use for the pear cam as the question asks for different answers than those already shown. Toys is given as an example of a use for a snail cam.

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Examiner Tip

Candidates do not appreciate how frequently marks are thrown away by not fully absorbing all the information given in the questions. Underlining key words in the question significantly helps to minimize this, and candidates that do this rarely fall foul of mis-reads.

Question 5

Many candidates found this a challenging question with the stronger answers being presented by candidates who have had experience of using CNC machinery. The question elicited a few complaints from centres stating that this topic is not covered in the endorsed book. Centres are respectfully reminded that questions are drawn from the specification rather than the book. As such basing a question on the 'process' of using CNC machines (item 2.4 – 11 in the specification) is no different from basing a question on the process of using a blow moulding machine or a manual milling machine, as was the case on last year's exam. (item 2.4 – 2 in the specification).

CNC machines are now common in schools and candidates should have a knowledge of how to use them. Where a centre does not have access to CNC equipment a visit could be set up to one that does so that candidates can gain some first hand experience of them. Alternatively video clips can be studied from the internet showing the setup sequence from which students could take notes. Having said this the large majority of candidates scored 2-4 marks for generic responses which focused on clamping materials, fitting tools and closing guards. The better responses included the input of material and /or speed data, the transfer of data to the CNC machine, and calibrating the machine axis to the material. Points were accepted in any order. Unfortunately a number of candidates based their answers around use of a laser rather than the specified CNC miller, lathe or router. These marks were awarded where steps had a parallel equivalent for the specificed machines.

5 CNC (Computer Numerically Controlled) machines require a set-up procedure prior to component manufacture.

Give the steps that must be performed prior to component manufacture when using a CNC lathe, router or milling machine.

The first and last steps have been given below.

Step 1 – Generate an image of the component required on a suitable piece of CAD (computer-aided design) software

Step 2

Upload image onto CNC machine

Step 3

Set up tool type

Step 4

Set up cutting speed

Step 5

Set up movement speed

Step 6

Insert material

Step 7

Zero tool to material

Step 8 – Start manufacture

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Examiner Comments

This example scored 5 marks out of the 6 available. A sensible sequence of operations has been presented, although the cutting speed and movement speed are taken from the same point in the mark scheme.

5 CNC (Computer Numerically Controlled) machines require a set-up procedure prior to component manufacture.

Give the steps that must be performed prior to component manufacture when using a CNC lathe, router or milling machine.

The first and last steps have been given below.

Step 1 – Generate an image of the component required on a suitable piece of CAD (computer-aided design) software

Step 2

Check all aspects of the component are correct ~~before~~

Step 3

Ensure the dimensions of the component are correct

Step 4

Select the material and ensure it is prepared for this process

Step 5

Check the machine is functioning correctly

Step 6

Place the material in the CNC machine

Step 7

Upload image for ~~machine~~ machine to manufacture

Step 8 – Start manufacture

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Examiner Comments

This form of response was quite common and simply listed a series of checks that could be done rather than steps that need to be carried out. It was awarded 2 marks for the last two steps.

Question 6 (a)

A well answered question with many candidates showing a sound knowledge of properties and being able to apply them to this situation. It is also encouraging to see candidates clearly justifying the properties stated with points related to the context. Many maximum mark responses were seen, although the most common reason for losing marks was repetition. In this case many answers were focused on the effects of water on the PVC. So answers like 'will not corrode', 'will not leak', 'will not degrade', 'will last a long time', were all too similar to be awarded separately. This question also suffered from another spate of the 'easy, efficient, effective' statements. Ductility was also a frequent incorrect answer.

6 Figure 3 shows the end of a drain pipe manufactured from polyvinyl chloride (PVC) tubing.

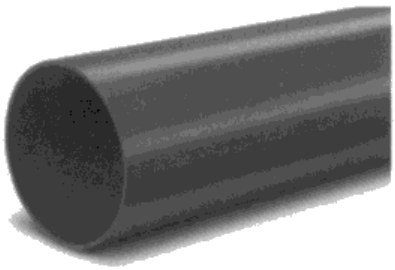

Figure 3

Two characteristics of PVC are its strength and its availability in a range of colours.

(a) Explain **three** further characteristics that make this polymer suitable for the manufacture of drain pipes.

1 PVC possesses a great degree of durability, it can withstand weathering and corrosion easily for a very long time.

2 PVC is a tough plastic, it will not shatter like Acrylic. PVC can withstand sudden and harsh blows without even cracking

3 PVC is a naturally hard material, it can't be worn away easily by friction but instead it can withstand scratches and scrapes without showing much wear at all

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Examiner Comments

A good response which gained the full 6 marks. The three properties stated are all relevant to the context and each has been correctly justified.

6 Figure 3 shows the end of a drain pipe manufactured from polyvinyl chloride (PVC) tubing.

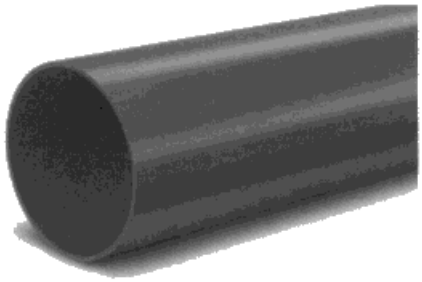

Figure 3

Two characteristics of PVC are its strength and its availability in a range of colours.

(a) Explain **three** further characteristics that make this polymer suitable for the manufacture of drain pipes.

(6)

1 - it has good chemical resistant meaning that the product will withstand the materials being pushed through.

2 - durable so it can withstand the outside forces and not get damaged.

3 - water proof as this will be needed to be a drain pipe.

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Examiner Comments

2 marks were awarded to this response for the first property and is relevant justification. The other responses are quite vague and too similar to be worth additional marks.

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Examiner Tip

You should draw on a range of knowledge when answering questions of this type so that you avoid similar responses that gain no further marks.

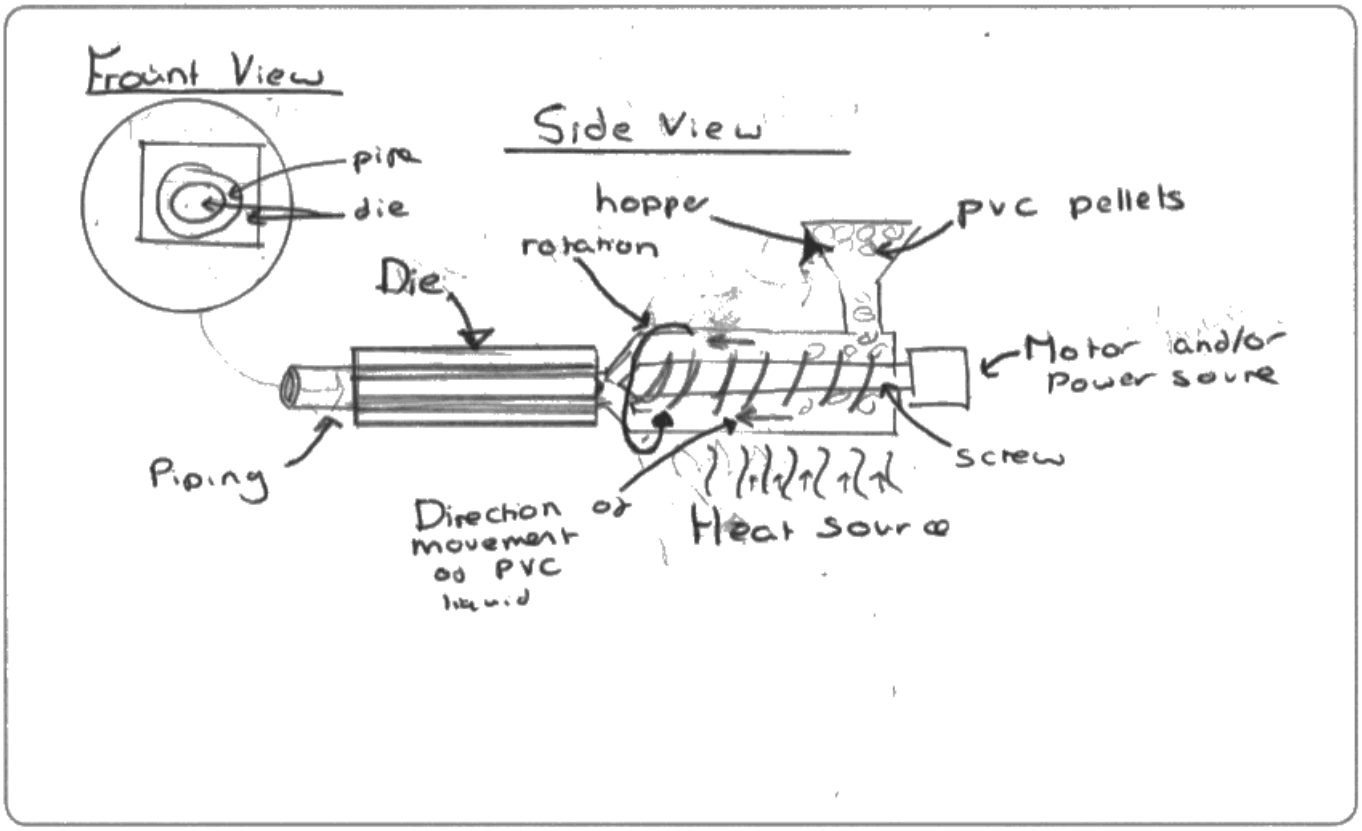
Question 6 (b)

Many strong responses were seen here with the majority of candidates scoring 5-7 marks out of the 8 available. Clear high quality diagrams were frequent, and candidates should be commended for this. Most responses showed a clear understanding of the extrusion process, re-enforced with detailed descriptions. Clearly this part of the specification is well understood. The challenging aspect here was whether candidates understood how hollow extrusions are manufactured, and approximately 15% of responses communicated this clearly and gained the full 8 marks. Having said this rarely was there an attempt at showing how the core (or pin as many called it) was held in place. There were also few run-out supports seen. A minority of incorrect responses focused on blow moulding and stretching type answers, which scored poorly.

(b) Continuous lengths of PVC tubing can be produced by extrusion.

Describe, using notes and/or annotated sketches, the process of extruding continuous PVC tubing.

(8)



PVC pellets are ~~are melted down~~ poured into the hopper and are forced down. The heat then melts the pellets, whilst they're being moved down by the screw which is being turned by an external motor/or power

source. The liquid plastic is forced into the die where it cools and hardens before being forced out the other end.

Done to ~~it~~ al the plastic always moving the plastic doesn't stick to the inside of the die

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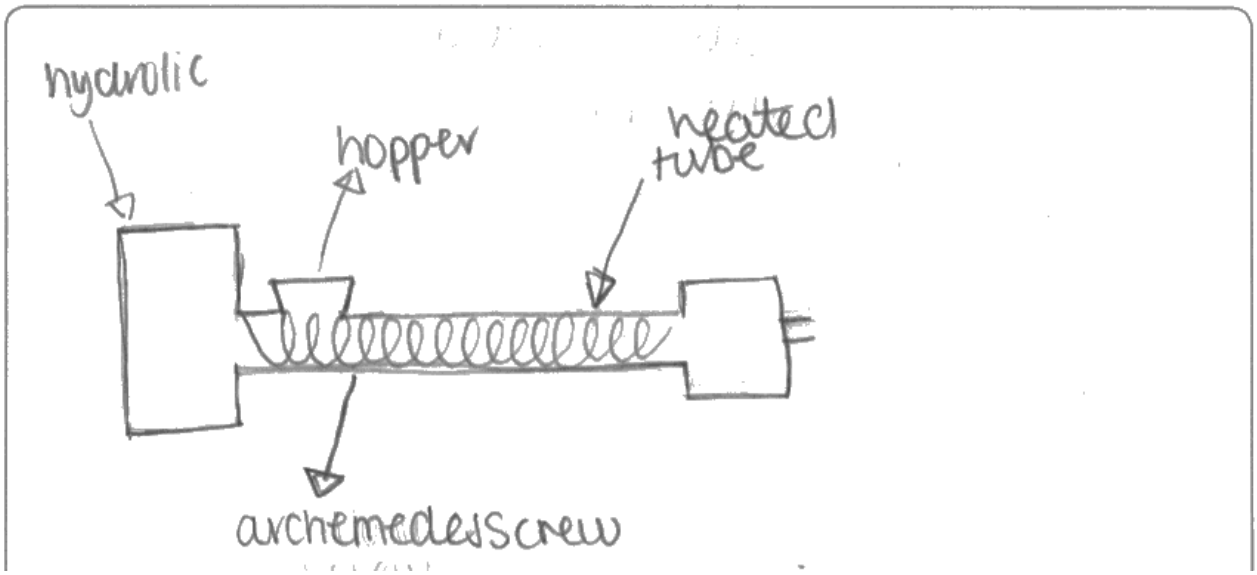
A good answer which scored the maximum 8 marks for the features shown in the diagram. It was also re-enforced by a detailed explanation. A secondary diagram labelled 'front view' communicates clearly the need for the core which is shown less clearly in the main drawing.

(b) Continuous lengths of PVC tubing can be produced by extrusion.

Describe, using notes and/or annotated sketches, the process of extruding continuous PVC tubing.

(8)



- granules of PVC will be checked for colour and then poured or using an automated vacuum are heated in the hopper
- It is then continued to be heated whilst being moved along by the archemidean screw.
- during this it will form a hollow tube of the PVC.
- Once complete it will have the same cross section which can be cut down to the required length.

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Examiner Comments

A much more simplistic response although the candidate has some knowledge of the main features in the process. This response was awarded 3 marks for three correct features shown in the diagram (hopper, heated and screw) and a further mark for identifying granules at the beginning of their explanation, making a total of 4.

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Examiner Tip

Where questions state that they can be answered with notes or diagrams, produce both. Full marks can be gained with either method but many candidates often showed additional evidence in one method that was missing from the other. An example was to show a hopper in the diagram which was neither labelled nor described, similarly text often mentioned the cooling of the pipe which was not indicated in the diagram. Both of these were awarded marks when seen.

Question 7

Many candidates presented strong answers with a range of positive and negative points regarding the use of LCD technology in mobile phone screens. Answers were drawn from all points of the mark scheme demonstrating a broad range of knowledge. A significant number of candidates drew on their wider experience of mobile phones and allowed their responses to deviate from the question focus. Such examples included discussions based around touch screen technology, comparisons with LED screens and software features such as self-dimming screens. These responses scored poorly. A number also deviated into lengthy descriptions concerning how LCD technology functioned, and also scored poorly. On a more positive note, many good examples of planning were seen which helped candidates stay on track with responses.

***7** Evaluate the use of liquid crystal display (LCD) technology in mobile phone screens.

LCD technology is lightweight, meaning it will not weigh down or drastically contribute to a products weight.
LCD's actually don't require as much energy as most screen types, this means that the screen will not be too much of a drain on the battery, making a charge last longer.
LCD's are tougher than most realise as in comparison to a plasma screen which when dropped will permanantly break, LCDs can still function with a broken screen
LCD's are much easier to manufacture than say Cathode ray tubes or Plasma screens, they take a fraction of the time.
LCD tech can be used in conjunction with QTC to make touch screen technology, which is commonly used in mobile devices
LCD's dont need to be constantly maintained, after installation they should work for life.

ResultsPlus
Examiner Comments

This is a good response that contains 6 positive points, but no negatives. It therefore scored only 5 marks, as an 'evaluate' question requires both positive and negative issues to gain the maximum mark.

***7** Evaluate the use of liquid crystal display (LCD) technology in mobile phone screens.

LCD display screens are used in mobile phones to produce a brighter more visible and attractive screen. The LCD technology allows the screen to have a ~~brighthe~~ brighter appearance which can be altered in terms of dimming and brightening the display screen using the setting in the mobile phone. LCD allows the user to experience an array of various colours also depending on the application being used on the mobile. This is a huge advancement from older phones which produced only 2 colours. LCD is hugely beneficial due to the wide variety of possibilities it offers to the phone and its users but is also slightly disadvantageous due to the high cost of the LCD display technology.

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Examiner Comments

This response gained only 2 marks for the correct points concerning screen brightness and a range of colours. It then deviates into software features of the phone itself, one of which is the dimmable screen feature.

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Examiner Tip

Use the top 2-3 lines of the answer space to write a plan of the key points for your answer noting both positives and negatives. Candidates that do this invariably score well.

Question 8 (a)

Few candidates gained the full 4 marks here, although most scored 2. The most common correct answer was 'strength' with a relevant justification. The vast majority of candidates then focused their answers on quality of finish, stability, cheapness or availability in large sheets. These answers show that candidates either did not see the requirement for 'mechanical' properties, or did not understand its significance. Mechanical properties are related to how a material responds to an external force, and the mark scheme was therefore limited to a few relevant properties. Many candidates gave functional or aesthetic properties instead, and in some cases general characteristics, all of which failed to gain marks.

8 Figure 4 shows a stool made from a painted mild steel frame and a plywood seat.

Figure 4

(a) Explain **two** mechanical properties that make plywood suitable for this application.

(4)

Plywood is strong, therefore will be able to withstand the weight of a person who is sitting on it.

It is not hard ~~that means~~ which means it is a lot easier to securing it to the frame, ie screws.

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Examiner Comments

A good answer with two clear mechanical properties justified with points relevant to the context. 'Not hard' is taken as soft.

8 Figure 4 shows a stool made from a painted mild steel frame and a plywood seat.

Figure 4

(a) Explain **two** mechanical properties that make plywood suitable for this application.

(4)

- The grain of each layer changes direction which makes the grain stronger allowing the seat to withstand more weight from the person sitting on it.
- As it is a manufactured board it isn't going to warp twist or cup affecting the shape of the seat.

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Examiner Comments

A good answer with two clear mechanical properties justified with points relevant to the context. 'Not hard' is taken as soft.

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Examiner Tip

Candidates must have a clear understanding of the mechanical, functional and aesthetic property groups.

Question 8 (b)

Most candidates produced strong responses to this question with most scoring 4+ marks. On the whole well balanced answers containing both advantages and disadvantages were presented. Where candidates failed to score well there was often an over emphasis on one aspect which was repeated over and over again. Some candidates diverted into features of quality assurance systems and total quality management strategies, which also failed to score marks.

*(b) Evaluate the cost implications to a business of running effective quality control systems.

(7)

A business may ~~what~~ wish to ~~fetters~~ run quality control systems. For example TQM (Total quality managment) this will be a costly process for a business as the cost of training at the begining will be very ~~cost~~ costly. This will be even more costly if the system isn't successful. If the business starts ~~to~~ the TQM system and then decides to stop it at a later date this will have been a waste of both time and money as the business is back to the ~~beginning~~ beginning. Businesses may also adopt to systems like BSI (Kitemark or ISO ~~9000~~ these both add recognination and trust to business from the customers point of view but they are costly to the business as they may have to change their Products, their Processes their technology or even their workers. This will be costly changes to the company

(Total for Question 8 = 11 marks)

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Examiner Comments

This response scored 3 marks for the following statements:-

'This will be a costly process'

'Costs of training'

'BSI… adds recognition and trust'

The remainder of the response is unfocused or misdirected.

*(b) Evaluate the cost implications to a business of running effective quality control systems.

(7)

The initial cost of starting quality control (QC) checks is high due to having to pay for machines or people to set up the machines, also having to train employees how to check parts or how to operate machinery that checks components for quality.
The maintainence of machines / wages of employees will be an ongoing cost because every batch should be checked, not just the first.
Having checked the components or products though, less customers will need refund / replacement for faulty products, improving customer relationships and encouraging them to repeat their purchase or spread positive word of the company.
Also, if components are checked early, they will not be processed to no further benefit, saving money and wasted materials

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Examiner Comments

This is an example of a good answer which was awarded the full 7 marks for the following points drawn from both the positive and negative sections of the mark scheme.

'the initial cost…. is high'

'pay for machines'

'wages for employees'

'less customers need refunds'

'spread positive words'

'saving money'

'and (saving) wasted materials'

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Examiner Tip

Again candidates that generated a small plan generally scored well.

Paper Summary

There is much to be positive about regarding the responses on this year's paper. The questions were wide ranging with some past areas coming round again, mixed with some new areas. Very few blank responses were seen indicating good coverage of the whole specification, and most candidates gained some, if not strong, marks on the longer questions. A concerning feature of this paper was the relatively large number of candidates who scored quite poorly at the start of the paper, yet went on to score well in the more challenging later sections. The first two questions centre on recall and understanding, the later questions on application and evaluation. Candidates could evaluate the cost implications of quality control systems but could not name a manual saw for cutting mild steel.

Based on candidates' responses to this paper centres should focus on the following:-

- Ensure that candidates have a foundational knowledge of tools and techniques as well as having a good understanding of the more industrial side of designing.
- Candidates must be detailed in their answers and not use simple unsupported statements such as 'it's easy, efficient and effective'.
- Candidates should draw out diagrams rather than just looking at them as part of their preparation for the examination.
- Many candidates will benefit from reading questions more carefully and underlining important words.
- When questions require multiple responses, candidates must ensure that each point made is different knowledge, not the same or similar knowledge in different words, which will be classed as a repeat.
- Candidates must have a sound understanding of the differences between mechanical, functional and aesthetic properties.
- With the longer essay type questions candidates are encouraged to use the top few lines of the answer space to generate a small plan of the points they intend to make.

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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