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Examiners' Report

June 2016

GCE Design & Technology: Product Design 2 6RM02 01

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June 2016

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Introduction

Centres are generally preparing candidates well for these examinations as they are clearly benefitting from past experience and the wealth of past papers available.

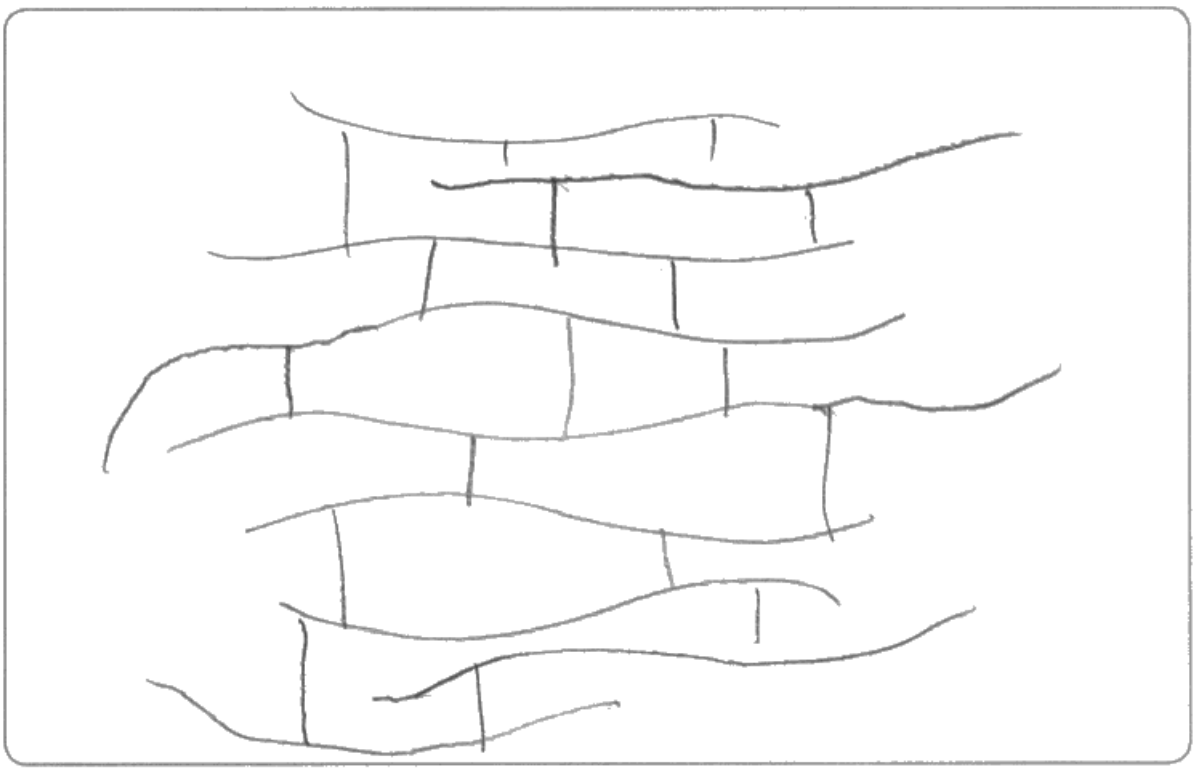
In most cases candidate's responses were well structured with points being contextualized in sentences. The longer questions requiring more in depth answers also contained appropriate detail with candidates understanding the need to explain points rather than just state points. Many good examples of essay plans were seen helping candidates structure their responses to these extended writing questions. Having said this there still remains the minority whose result is significantly affected by poor exam technique rather than lack of knowledge. Some samples of this have been included in this report in an attempt to continue to stress the importance of this topic.

Question 1 (a)

A straight forward introductory question, although many found it challenging. The forms of diagram presented differed immensely across the cohort although most clearly demonstrated knowledge of the molecular structure required. The two features being looked for were some form of long strands, and also for definite cross-links between these strands. The majority scored 1 or the full 2 marks showing a good understanding of the structure.

1 (a) Draw a diagram showing the structural composition of thermosetting plastic.

(2)



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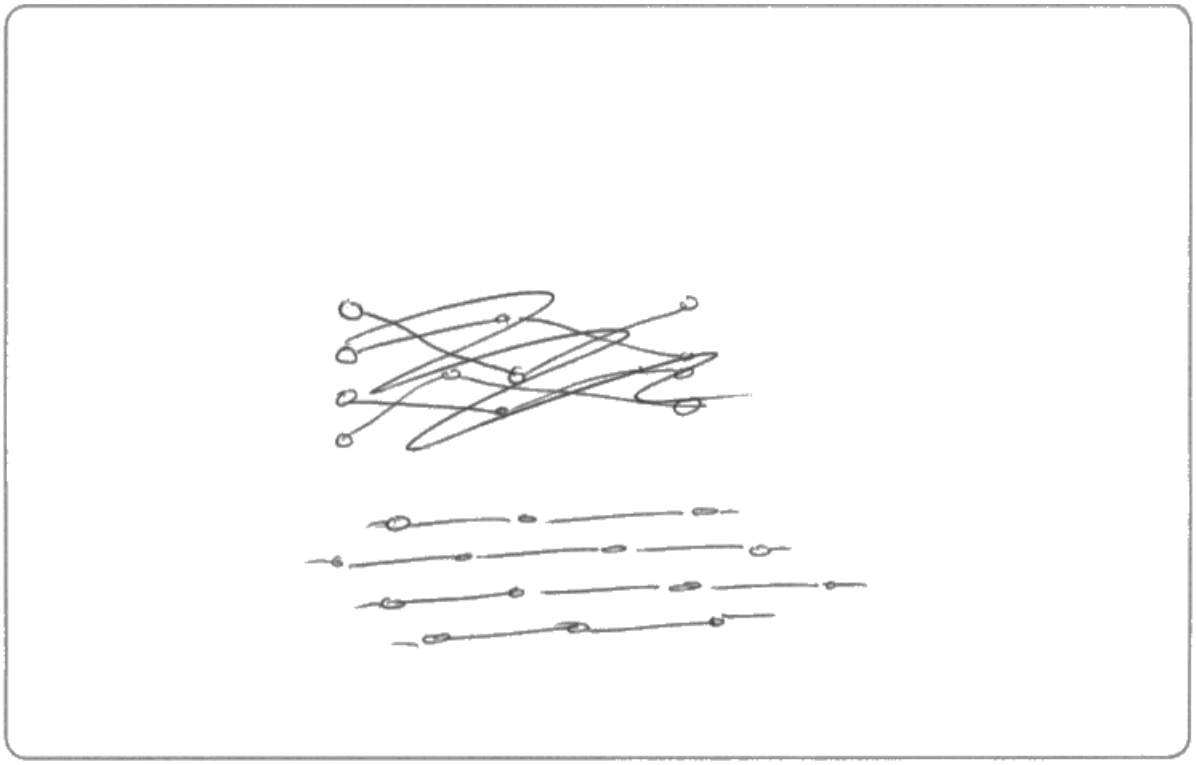
Examiner Comments

This sample is a good representation of the 'stone wall' type diagram which clearly shows the strands and the cross-links that link one strand to another. This response scored the full 2 marks.



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Examiner Comments

In this response strands were shown as linked molecules both in a random pattern and a linear pattern. In neither of the diagrams are there cross-links between the strands. The top diagram shows strands overlapping, but gives no definite indication of a bond at the overlap points. Therefore this response only scores 1 mark. Similar responses to the random pattern shown with dots drawn at the overlap points were given the full 2 marks as the dots indicated a definite bond.

Question 1 (b)

This question required candidates to identify the characteristics of polystyrene and filter them to identify just the ones that were beneficial to the disposable cutlery shown. The characteristics of lightweight and colour, being simplistic responses were stated in the stem and as such were removed from the pool of available answers. The vast majority of candidates comfortably identified 3 characteristics, the most common ones being 'easily mass produced, recyclable and/or cheap'. Scoring higher than this became progressively more challenging with only the some candidates scoring the full 6 marks.

(b) Figure 1 shows an image of some disposable cutlery manufactured from polystyrene.

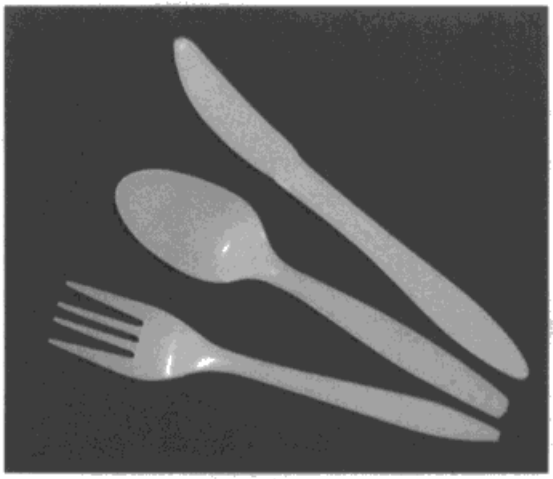

Figure 1

Polystyrene was selected for the disposable cutlery as it is lightweight and available in a range of colours.

State **six** further characteristics of polystyrene that make it a suitable material for disposable cutlery.

(6)

1 Cheaper than using metal

2 recyclable

3 Has good tensile strength so it doesn't break easily

4 Easy to shape in production

5 Not expensive to replace if broken or damaged

6 High melting point so hot food does not melt it

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Examiner Comments

A total of 5 marks was awarded to this quite strong response. No mark was awarded for the fifth answer as it is a repeat of the first. Note that where the meaning was clear, one word responses were accepted for this type of 'state' question.

State **six** further characteristics of polystyrene that make it a suitable material for disposable cutlery.

(6)

1 Hygenic, will not be contaminated

2 rigid

3 strong

4 flexable

5 cheap

6 light weight

(Total for Question 1 = 8 marks)

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Examiner Comments

Here the candidate was only awarded 3 marks for 'hygienic', 'rigid' and 'cheap'. 'Strong' was taken as a repeat of 'rigid'. 'Flexible' is a characteristic of polystyrene but it is not a beneficial one for cutlery as the more flexible the material is the more difficult the cutlery would be to use. The final response is stated in the stem so is invalid.

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Examiner Tip

Take special note of exemplar answers given as part of the question, as these cannot be used in your own response.

Question 2 (a)

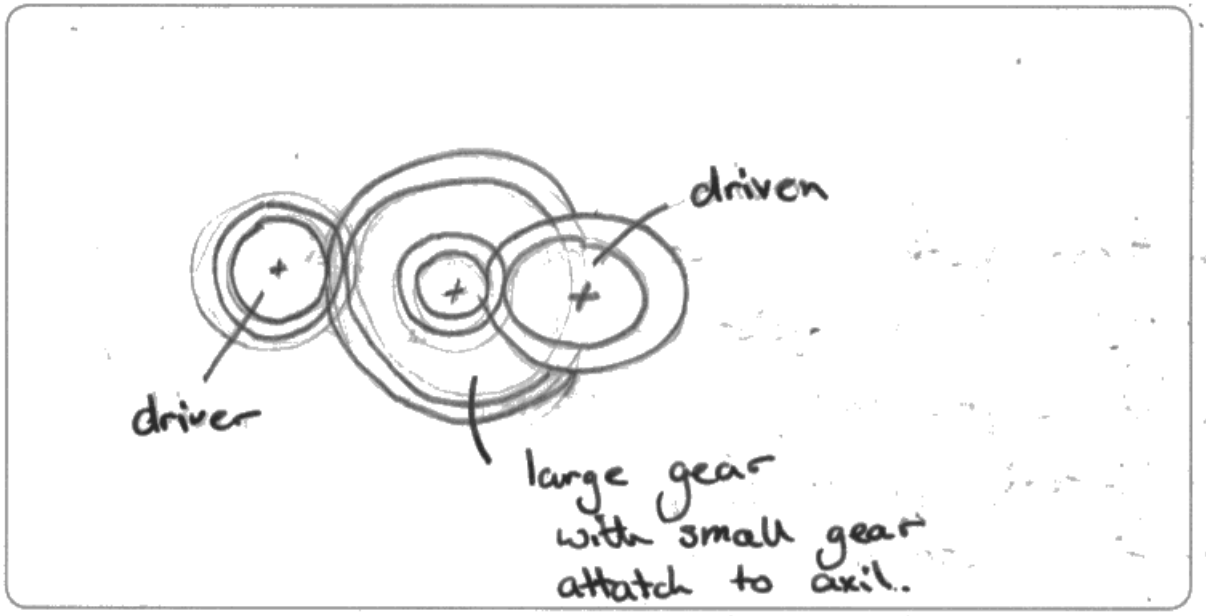
A single mark question which required candidates to name a type of gear. Ideally the spur gear in the diagram would be named, although the wording of the question is such that any type of gear was acceptable. It was therefore disappointing that a large minority were not able to correctly identify the name of a gear. Common incorrect answers were 'driver and driven' or 'idler' gears. These responses described the function of the gears rather than naming them.

Question 2 (b)

Disappointingly only a small minority of candidates correctly produced a diagram of a compound gear train. The most common answer by far was a simple gear train usually with three gears. A small number gained a single mark for showing two gears on the same shaft, although the smaller gear was not meshed with any other gear.

(b) In the box below draw the graphical symbol for a compound gear train.

(2)



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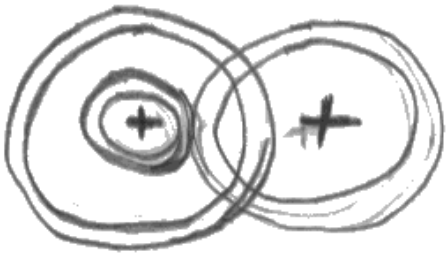
Examiner Comments

A reasonably well sketched answer clearly showing a compound gear train. This response gained the full 2 marks for the two features showing two pairs of meshed gears and two gears on the same shaft.



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Examiner Comments

This response gained a single mark for the two gears on the same shaft. It should also be noted that like this one the majority of responses showed the outer of the two concentric circles touching each other rather than overlapping like the previous example. The overlapping indicated the gears are fully meshed rather than just the tips of the teeth touching. Candidates were not penalised for this inaccuracy, but the issue should be made clear to future candidates.

Question 2 (c)

This was the poorest answered question on the paper. A simple statement saying that a compound gear train will give a speed or power change was insufficient, as would a simple gear train. A minority of candidates gained a mark for recognizing that a greater speed or power change was achieved over a simple gear train. Very few references to larger gear ratios or mechanical advantages were made. A small number of candidates gained one or both marks for the recognition that less space is needed for an equivalent speed or power change reducing the size of the product.

(c) Explain **one** advantage a compound gear train has over a simple gear train.

(2)

Can create a greater ratio, so a greater mechanical advantage and have more gears to reach greater speeds

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Examiner Comments

This sample is one of the very few that gained 2 marks for a correct advantage of a compound gear train over a simple gear train.

(c) Explain **one** advantage a compound gear train has over a simple gear train.

(2)

In a Compound gear train, both gears move in the same direction, whereas a simple gear train goes in two opposite directions

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Examiner Comments

This sample shows the most commonly seen incorrect response as both simple and compound gear trains can maintain or reverse the direction of rotation. Other common incorrect responses included references to being able to have multiple outputs from a single input and being able to change speeds easily like a car gearbox.

Question 2 (d)

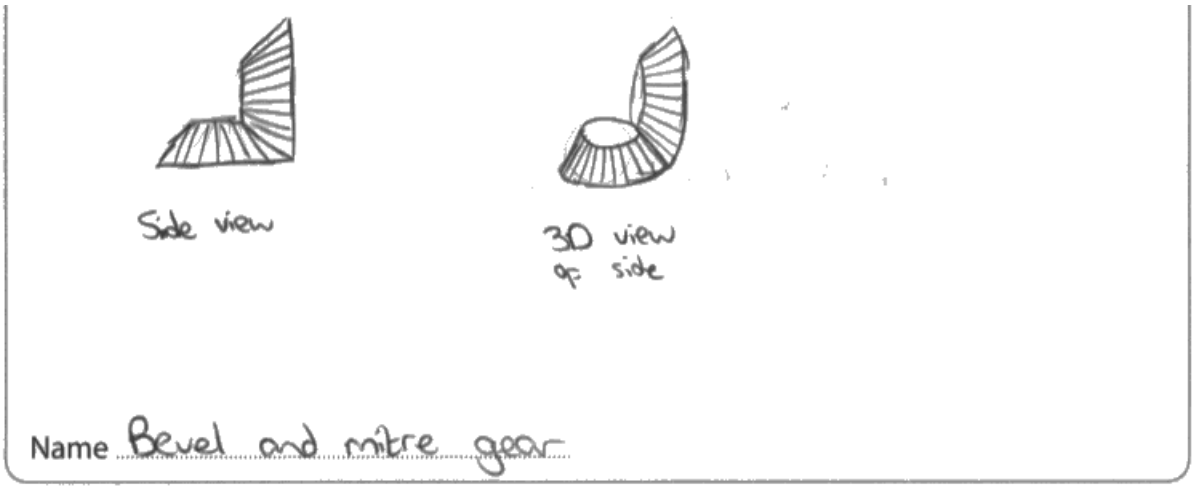
A reasonable number of candidates scored both marks for correctly sketching and naming a bevel or mitre gear system, although some diagrams were very poor. Common incorrect answers were rack and pinion, idler gear and angled gears. A small minority of candidates also stated a worm and worm wheel, which would transfer motion through 90, but would not be suitable for the specific power drill shown in the illustration.

(d) Figure 3 shows a drill with its chuck mounted at a 90° angle to the motor in the body.

Figure 3

In the box below draw and name the type of gears used in the drill to transmit motion through 90°.

(2)



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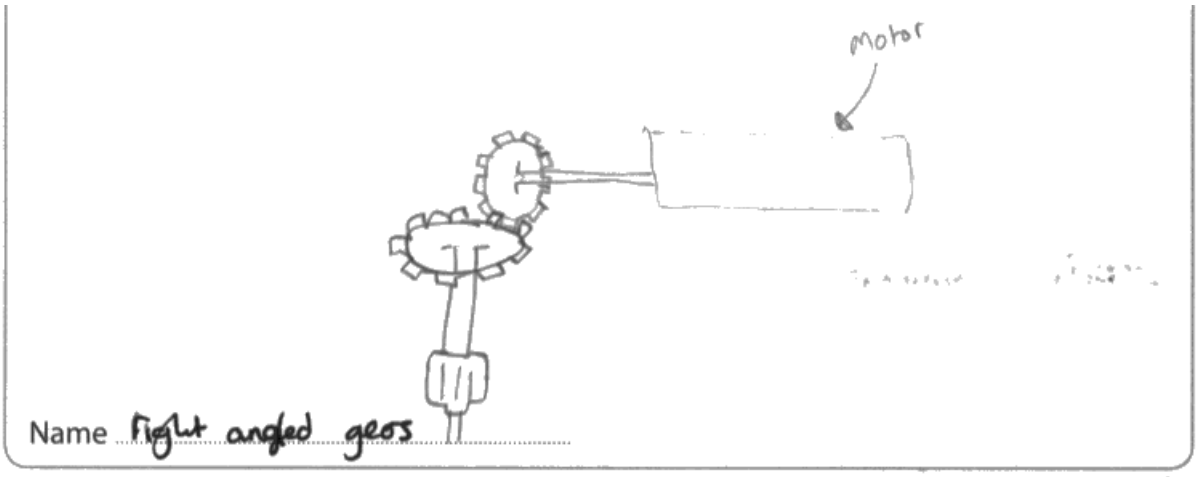
Examiner Comments

This is a good answer with a clear sketch that gained the full 2 marks. Responses drawn in pictorial or graphical form were accepted. Note that in this response the candidate called the system a bevel and mitre gear rather than just a bevel gear or a mitre gear. This was seen many times indicating a shallow knowledge.



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Examiner Comments

This response shows gears most likely to be crown or face gears. It shows sufficient understanding of the system required but only gained 1 mark as the name was incorrect.

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Examiner Tip

When the mechanisms section of the specification is examined it historically elicits low scores from candidates. This content needs to be studied thoroughly using practical examples where possible in order to gain a solid understanding of how mechanisms are used in products.

Question 3 (a)

Less than half the candidates were able to state the name of a specific metal which is suitable for manufacturing the body of the bench vice shown. Firstly candidates needed to recognize that the body of the vice had been cast, and then identify a metal suitable for casting, with cast iron being the ideal response. Many answers stated mild steel, high carbon steel or just steel.

Question 3 (b)

Many correct responses for this question were given which showed a good understanding of the corrosion resistant properties of zinc. The most common disadvantage stated related to the additional costs involved, although all answers on the mark scheme were seen.

Question 3 (c)

This question concerning copper wire was as much about candidates' knowledge of what mechanical properties are as it was about copper itself. It was clear that few candidates understood the mechanical property distinction. The vast majority of responses simply explained suitable properties of copper for the manufacture of wire regardless of whether they were mechanical properties or not, of which the most common were 'good conductor', 'light weight' and 'corrosion resistant'. These properties did not gain marks. Having said this a few candidates did show discernment and were able to gain the full 6 marks.

(c) Explain **three** mechanical properties of copper that make it suitable for electrical wire.

(6)

1 Conducts electricity well so can be used to transmit electricity efficiently.

2 Is ductile so that the copper can actually be drawn out into wires easily without breaking

3 Cheap. Meaning wires can be produced economically for a decent price.

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Examiner Comments

Good conductor was the most common incorrect response given as shown here. The second answer concerning copper being ductile was the most common correct response, and was generally well explained. The third response which relates to cost is a characteristic rather than a property. This response was therefore awarded 2 marks for the correct explanation of ductile.

(c) Explain **three** mechanical properties of copper that make it suitable for electrical wire.

(6)

1 Good Conductor of electricity so doesnt become overly powered + explode.

2 Good Conductor of heat so when lots of power is going through it it doesnt set fire or over heat

3 strong- If it is pulled harshly, it is un likely to break.

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Examiner Comments

This answer also gained only 2 marks for the final response and its explanation relating to strength. The first two answers are not mechanical properties.

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Examiner Tip

Make sure you have a clear understanding of the different types of properties. Mechanical properties relate to how materials respond to an applied force.

Question 3 (d)

Work hardening was a reasonably well understood topic with most candidates scoring at least 1 mark, and a good proportion both marks. Most answers in the mark scheme were used.

(d) Describe the effects of work hardening on copper.

(2)

Work hardening can make copper brittle and prone to snapping easily if bent too much.

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Examiner Comments

This response scored the full 2 marks for 'brittle' and 'snapping', which copper will eventually do if bent too many times in the same place

(d) Describe the effects of work hardening on copper.

(2)

the copper is heated until cherry red, it is then left to cool or quenched.

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Examiner Comments

This form of response was seen a number of times and illustrates an example of the candidate not reading the question carefully. A good description is given of a heat treatment process but it has little to do with the question so was awarded no marks.

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Examiner Tip

Reading questions carefully is an absolutely essential skill if candidates are going to achieve a score which reflects their knowledge of the subject. Underlining key words in the question is now commonly seen, but avoidable mistakes are still being made by those who don't.

Question 4 (a)

Kiln seasoning is clearly a well understood area of the specification with many candidates scoring well on this question. Most candidates comfortably identified three and often four advantages of kiln seasoning over natural seasoning, although relatively few candidates had sufficient depth of knowledge to score the maximum 5 marks. The most common responses related to speed, not weather dependant, eradication of insects and stability. Common incorrect responses included references to kiln seasoning making the wood stronger, improves its aesthetics and removes knots!

4 (a) Timber is usually seasoned before use.

Outline the advantages of kiln seasoning over natural seasoning.

(5)

- Kiln seasoning is much faster than natural seasoning, taking 2-6 weeks to dry the wood.
- It is also suited for the mass production of wooden objects as the wood is readily available.
- Much more effizient process than natural seasoning which takes up to 6 years.
- 99% of the moisture is removed
- Bacteria and parasites are also killed off during the process
- More wood is able to be stored in a kiln shed and can be compacted.

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Examiner Comments

This is an example of a weak response where the candidate has made a number of errors. 1 mark was awarded for kiln seasoning being identified as a 'faster' process. References to 'mass production' and making wood 'readily available' are exemplification of the same point. 'Efficient process' is a further repeat of the same point.

'99% of the moisture is removed' is incorrect. 1 mark was awarded for the eradication of 'parasites'. The final point is also incorrect, bringing the total for this response to 2 marks.

4 (a) Timber is usually seasoned before use.

Outline the advantages of kiln seasoning over natural seasoning.

(5)

Kiln seasoning is done indoor. Therefore an constent temperature and ~~moisture~~ environment will be provided. This means even drying. Wrapping or cupping are less likely to happen. Shorter amount of time will be needed due to the room. Rather than natural seasoning depends on the weather (unpredictable). Steam will be pumped through a pipe. This kills the bacteria and other insects are living in the plants. Which keeps the plank complete for use.

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Examiner Comments

This example is a strong response gaining the full 5 marks for 'constant temperature', 'even drying', 'cupping is less likely', 'shorter time' and 'kills the … insects'. The candidate has stayed focussed, has not deviated and has kept repeats to a minimum.

ResultsPlus
Examiner Tip

Be aware of repeats. Using different words to make the same point several times is a common error as each point in the mark scheme is only awarded once. Candidates should read their responses through specifically checking for errors such as these.

Question 4 (b)

This question probed candidates ability to analyse the properties and characteristics of two different solid woods comparing their suitability for school use. Significant numbers of candidates were able to access the question well and picked up some, if not full marks. There was also a large proportion who found this question quite challenging and fell back to the superficial responses of cheaper, stronger, and harder which were incorrect in this situation. Many candidates correctly stated that pine was easier to work, although few of them were able to explain why this is the case. Simply identifying pine as a softwood was not an acceptable explanation as some softwoods are quite hard.

Candidates who gave faster growing and light weight were usually able to give relevant explanations as to why these were advantages. Incorrect responses often stated that pine had less knots, it is tougher than beech and pine had a better finish.

(b) A school student selects pine rather than beech to manufacture a product, partly because pine costs less and has good aesthetics.

Justify **two** further reasons for selecting pine, in preference to beech, to manufacture the product.

(4)

1 Pine is a lighter in wieght, this may be an advantage to the product as it will have had a reduced weight and may be easier to pick up/ use.

2 Pine is easier to cut/work with than beech. During the manufacture, this may be more efficient as less time will be spent cutting/working the wood.

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Examiner Comments

This response gained the full 4 marks with two explained points. The first focusses on light weight explained with reference to making the product more portable. The second advantage identified was that pine is easier to work, explained with less time needed for manufacture.

The candidate clearly understood the requirement to explain the points made in order to gain the full marks.

(b) A school student selects pine rather than beech to manufacture a product, partly because pine costs less and has good aesthetics.

Justify **two** further reasons for selecting pine, in preference to beech, to manufacture the product.

(4)

1 Pine can be manufactured easier than beech, for instance, its easier to drill holes into pine, and pine can be cut easier too.

2 Pine is a very sturdy peice of wood and it will be able to undergo more pressure than beech.

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Examiner Comments

Here the candidate received 1 mark for a stating that a pine product is more easily manufactured. There follows examples of specific manufacturing processes that are easy. This is further exemplification of the same point rather than an explanation of why this is an advantage. The second point is incorrect.

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Examiner Tip

Candidates should understand how to explain a point not just repeat it with different words.

Question 5 (a)

Most candidates found this health and safety question very straight forward with most responses gaining 5, or the full 6 marks. Common risks identified included RSI, muscular issues and eye strain, most of which were supported with appropriate control measures. Candidates lost marks by repeating either risks or control measures with different words. For example taking regular breaks, and not working for long continuous stretches, are the same overall responses.

5 Computer-aided design (CAD) and computer-aided manufacture (CAM) are used extensively in the design and development of products.

(a) Describe **three** health and safety risks, and the subsequent control measures needed, when working at a computer for an extended period of time.

(6)

1 Risk repetitive strain injury from mouse and keyboard.

Control measure Take regular breaks

2 Risk Back pains from leaning forward

Control measure Find an ergonomic chair that suits the needs of the worker, ensure screen, keyboard and mouse are at correct heights and distances.

3 Risk Damage to eyesight / headaches.

Control measure ensure computer screens visual settings are at the right levels, take regular breaks, drink lots of fluid.

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Examiner Comments

This response gained the full 6 marks with three clear and very different risks followed by relevant and different control measures.

5 Computer-aided design (CAD) and computer-aided manufacture (CAM) are used extensively in the design and development of products.

(a) Describe **three** health and safety risks, and the subsequent control measures needed, when working at a computer for an extended period of time.

(6)

1 Risk repetitive strain from using a computer in same position for a long time and typing

Control measure have frequent short break away from screen and on feet rather than in same place

2 Risk back problems ~~from~~ from leaning over to look at screen and type a lot.

Control measure ergonomically designed chair to mirror the natural shapes of body when sitting so more comfortable and supportive in position

3 Risk human error from tiredness and boredom in work.

Control measure restrict shift hours on computers and have role switches between sections to avoid 1 person doing the same job for too long

~~eyesight~~?

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Examiner Comments

Only 4 marks were given to this response as the last answer is generic to almost any task rather than being linked to the use of computers. A number of these spurious responses were seen including electrocution, dehydration, hunger, etc. which are not specific risks linked to long term use of computers.

Question 5 (b)

A challenging question which stretched even the better candidates. Most responses gained 3-4 marks for the general advantages of using RPT machines, but candidates were required to go further in their thinking in order to explain the advantages this brought to a business. Some candidates did, although very few reached the maximum of 8. A significant number of candidates lost marks as their responses diverted into giving advantages of virtual modelling over physical modelling, or RPT models over virtual models. These candidates should have spent a little more time fully absorbing the parameters of the question in order to focus their answer more appropriately.

*(b) Many businesses manufacture models of designs using rapid prototype machines rather than traditional modelling methods.

Explain the advantages for a business of using rapid prototype machines when modelling designs.

(8)

Rapid prototype machines are much quicker than traditional modeling methods. They are also much more accurate than traditional modeling methods and can produce a good scale model of the product that the business can then test based on size, aesthetics and it being user friendly, this makes them better for testing. Using rapid prototype machines also make it much easier to edit and improve the design a produce a new model with the adjustments. Using these machines also means that they wont have to pay for either a craftsmen or workshop worker to make it for them. Rapid prototype machines are also much better for making very complicated models ~~which~~ of a standard which would be unachievable by using traditional Modelling methods.

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Examiner Comments

This strong response scored 7 of the 8 marks available. The candidate identified a number of the advantages of using RPT machines over traditional modelling methods which include speed, accuracy, easily edited and reduced costs. They also went on to explain a number of the subsequent advantages this brought to the business. These included more complex models, better testing and improved designs.

*(b) Many businesses manufacture models of designs using rapid prototype machines rather than traditional modelling methods.

Explain the advantages for a business of using rapid prototype machines when modelling designs.

(8)

There are Many advantages for a business using Rapid Prototyping, One of them is that there can be extremley accurate Models produced through rapid prototyping and can leave the product looking like the real thing.

Secondly using rapid prototyping can lead to very accurate testing of the ergonomics of the Product and the Manufacturer can use this for good testing purposes.

Also rapid Prototyping is a relatively quick process compared to traditional Methods and a real life scale model can be produced in a matter of hours.

Lastly rapid Prototyping can create great ~~home~~ hollow Products which can enable the manufacturer

to see what the real life product will look like.

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Examiner Comments

This response starts off well with 3 marks being awarded for identifying the advantages of accuracy, better testing and speed of production. The response then diverts into comparing an RPT model with a virtual model rather than a traditionally made one, and gains no further marks.

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Examiner Tip

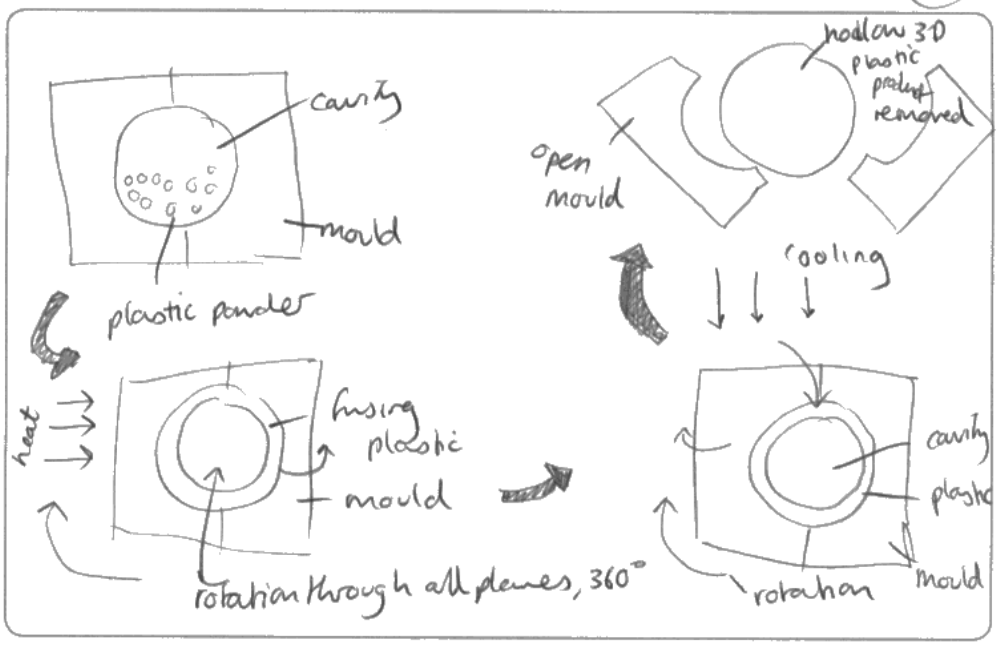
Regularly checking back to the question or making a small plan will help candidates remain focussed on responding to the question rather than diverging into irrelevant areas.

Question 6 (a)

A good proportion of candidates responded well to this question on rotational moulding and achieved the full 7 marks. Having said this it was clear the process was not fully understood by the majority of candidates. Many responses contained diagrams or explanations of either the injection moulding or blow moulding process with the addition of a spinning mould or die. This form of response gained some marks for identifying correct features such as the mould and the use of heat, although no marks were awarded for simply stating that the mould rotated, as this is explicit in the given process name. An understanding of multiple axis rotation was being looked for in order to approach full marks. High speed rotation was also commonly seen which didn't gain a mark as this would not result in an even lining of the mould.

(a) Using notes and/or sketches, describe the rotational moulding process.

(7)



- mould made with negative cavity for plastic, withstand heat well.
- plastic powder poured into mould
- mould is heated + rotated through 360° in 3 planes
- plastic powder fuses around edges of mould
- whilst rotating, & cooling occurs
- plastic sets solid into mould
- mould opened and 3D plastic shape is removed and finished
- mould can be re-used again.

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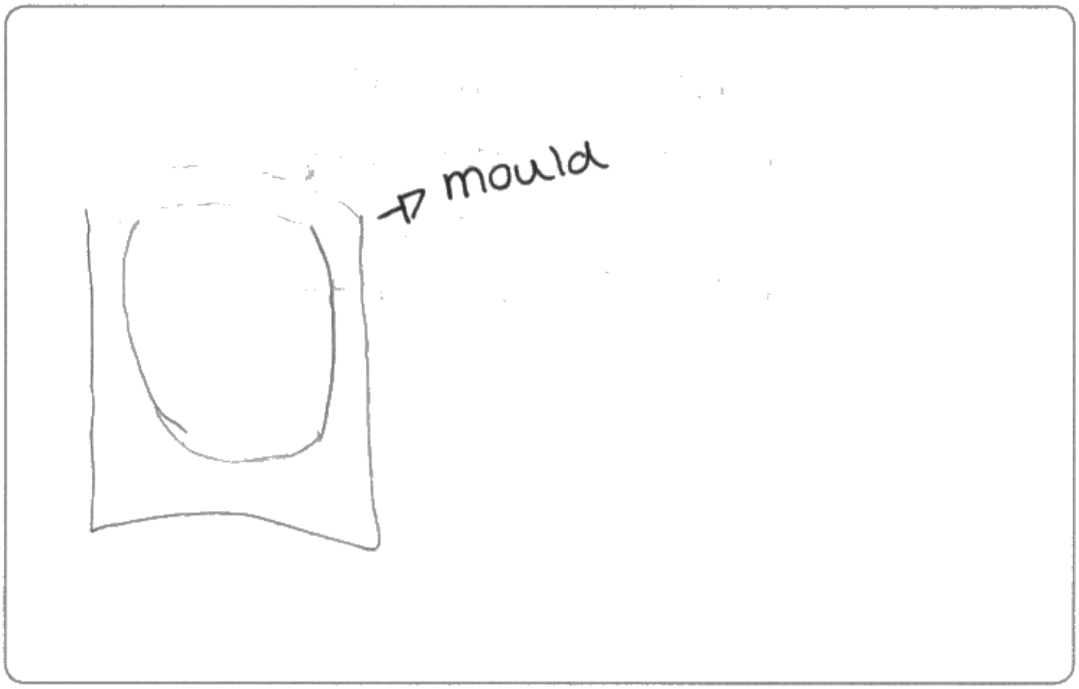
Examiner Comments

This answer was awarded the maximum 7 marks for a clear understanding of the process. The candidate could have been awarded the full marks for either their diagrams or their written explanation, as both contain sufficient detail. This was not the case with many responses as additional marks were often gained from features shown in their diagrams which were not given in their explanations, and vice versa.

(a) Using notes and/or sketches, describe the rotational moulding process.

(7)



The mould is rotated when the molten plastic is poured in, this makes sure that all parts are filled with plastic. After it is poured in the mould is left to set.

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Examiner Comments

A weak response which was awarded 2 marks for recognising that both a mould was needed and that molten (heated) plastic is a feature of the process. Responses like these were not that uncommon indicating that rotational moulding is probably not as well understood by candidates as the other polymer moulding processes in the specification which have been answered well in past years.

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Examiner Tip

Where a question asks you to respond using notes and/or diagrams it is better to do both where time allows. Although full marks can be gained through either method many candidates picked up additional marks by presenting both methods.

Question 6 (b)

This question penetrated deeper into candidate's knowledge of polymer moulding processes by asking them to identify the advantages of rotational over injection moulding. Many candidates scored 1-2 marks for identifying that rotational moulding was better for producing both hollow and larger mouldings. Stronger candidates identified further advantages with all points on the mark scheme being seen frequently.

(b) Outline the advantages of rotational moulding over injection moulding.

(4)

- Rotational moulding creates a ~~wor~~ hollow shape with a uniform thickness
- ~~The~~ It can produce curved / rounded edges which are very smooth.
- It requires less skill to produce the mould.
- It is a quicker process
- You are able to make any size you want - can create larger products
- Able to use a wider range of plastics

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Examiner Comments

This response was given 3 marks for identifying the advantages of being able to produce hollow mouldings, that moulds are simpler to manufacture, and that the process is more suited to producing larger mouldings. The candidate has also given a range of other points which are generally correct characteristics of rotational moulding, but are also equally achievable with injection moulding, and are therefore invalid.

(b) Outline the advantages of rotational moulding over injection moulding.

(4)

Rotational moulding gives a smoother finish to the product than injection moulding. Rotational moulding to gives the product better aesthetics.

It is often less expensive to run than injection moulding. It is often quicker than injection moulding. It is also a quicker drying method than injection moulding.

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Examiner Comments

This weak response shows that the candidate does not understand the significant features of the two processes and is therefore not able to identify relevant advantages. The responses given are superficial and repetitive focusing on speed, cost and aesthetics. None of these are correct in this context.

Question 7

The final question on the paper produced a wide range of marks across the ability level. Most candidates correctly understood the direction of the question and were able to access the mark scheme gaining 4-6 marks. Some candidates were able to sustain their focus and score the higher marks whilst many others diverted away from the impact on employees to the effects on the business focussing on higher quality products, company reputation and ISO 9000 issues.

***7** The use of total quality management (TQM) strategies affects many areas within a business.

Evaluate the impact on employees of using total quality management (TQM) strategies.

(10)

TQM gets more employees involved so that they feel valued and each department is treated as a client. This increases employee morale as well as motivation and aids the development of a team mentality. Employees will also be better trained and there will be less absentees. This will also increase working conditions and new methods of working for employees and increase health and safety aspects for staff. This will correlate to increased Productivity and higher quality of products for greater profit from increased sales. Also as a result, fair wages will be implemented for workers so that they again feel valued and satisfied. ISO 9000 award can be given to a business like this for good standards/trade which would increase

company and staff reputation positively, leading to increased/repeat business and economies of scale developing. (PTO) →

TQM may not be for all employees tho and some may be reluctant to change and the benefits of TQM will take time to filter through so changes/improvements are not all instantaneous. The business will also need to spend money on training staff and work conditions development. Also the business higher member staff need to spend money to respond to department concerns as they are treated as clients.

ResultsPlus
Examiner Comments

This strong response was awarded the full 10 marks for an understanding of the many ways employees could be impacted by the implementation of TQM. Feeling valued, treated as a client, increased motivation, team mentality, additional training, less absenteeism, better working conditions, more productive and fair wages are all positive impacts. The response then diverts into impacts on the company rather than employees which scores no marks. The final mark is awarded for the negative impact of people being reluctant to change.

Note that questions which use the 'evaluate' command word require responses that are both positive and negative to reach the maximum score.

*7 The use of total quality management (TQM) strategies affects many areas within a business.

Evaluate the impact on employees of using total quality management (TQM) strategies.

(10)

TQM affects employees a lot because they need to make sure that the measurements of the product are within a certain tolerance. If the product is not within the tolerance then it will be thrown away. This puts lots of pressure on the employees because they will need to be consistently accurate. Quality assurance will have an impact on the employees because if the ~~end~~ Customer is not happy then the employees will need to fix this issue. Quality Control has an ~~impact~~ impact on employees because they will need to do more quality control tests so that the product is meeting the national standard. If the employees work is not to a high standard then the Company may replace them with robotics. The Company will need to be at BSA standard and this will mean making products with high precision.

ResultsPlus
Examiner Comments

This final answer is an example of a meandering response that drifts in and out of the question focus. The initial point is taken as point 3 in the mark scheme relating to employees checking the quality of their own work, although it is not clear. A negative issue concerning increased pressure on employees is then correctly stated and gains a second mark. The response then moves away and considers the customer before coming back to repeat mark scheme point 3 concerning the employee needing to do more quality tests. The reference to replacing workers with robots is given a third mark as it is sufficient for mark scheme point 17 which concerns unemployment. The final statement then moves away from employees to consider the impact on standards and the quality of the product. A few minutes to think through the relevant issues and write a plan of key words may have helped this candidate higher.

ResultsPlus
Examiner Tip

Writing a plan of positives and negatives before generating the response significantly improves the quality of candidate's responses and helps them to remain focussed on the correct issues rather than going off on tangents.

Paper Summary

Many examples of quality answers with good use of exam technique can now be seen in these exam scripts.

Also 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. An on-going concern of this and previous papers is the low level of knowledge shown relating to the mechanisms section of the specification, as this without doubt contained the poorest answers.

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

- Ensure that candidates have a good knowledge of the mechanisms section of the specification.
- Many candidates will still 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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