

# DESIGN AND TECHNOLOGY

Paper 9705/11

Written 1

## General Comments

The performance of candidates was very mixed and ranged from poor to the very good. It was evident that in a number of cases candidates had only limited knowledge and understanding of the subject matter required to respond correctly to the questions they had chosen to answer.

Time management proved to be a problem for some with a number of candidates failing to complete all of the parts of the questions they had chosen to answer. This particularly applied to **Section C**.

Some repetition was seen in candidates' answers to questions in all sections of the paper. Some drew the same thing more than once, for example a design would be drawn as a three-dimensional view and then repeated using a two-dimensional view that showed no more detail than the first drawing. A common error in written responses was for candidates to repeat the same point two or more times using slightly different words.

In some cases candidates had not read questions carefully or fully enough before starting their answers. This resulted in responses which did not address what was asked for in the question. Candidates must make sure that their answers are focused on the question being asked and that their responses are concise and display appropriate subject-specific knowledge and understanding.

Candidates need to pay attention to how many marks are available for each part of a question, and structure their responses accordingly.

## **Section A**

The better answers in this section were those that used a sequence of three or four annotated sketches to describe clearly, step by step, how the appropriate tools, equipment and processes could be safely used to achieve the required results. It is not sufficient to just draw or list the tools; their use must be shown and described. The use of lots of continuous text should be avoided when answering questions in this section.

## **Question 1**

- (a) The majority of candidates named a suitable sheet material for making part **A** of the spatula. The most common correct answers were aluminium, stainless steel and mild steel. Surprisingly a number of candidates incorrectly stated that plastic would be a suitable material.

Suitable reasons for choice included the material could resist heat and in the case of aluminium or stainless steel would be reasonably easy to clean. General reasons such as 'the material is readily available' or 'the material is easy to work' are not appropriate and do not gain marks. Reasons need to relate to the specific situation that is given in the question.

- (b)(i) A good number of candidates did not read the question carefully enough and incorrectly spent time describing how the shape could be marked out. While almost all candidates showed at least some understanding of how the cutting process could be carried out, some of the methods suggested, such as using an angle grinder, were not totally appropriate. This would not be the safest or most accurate way of carrying out the process. Most candidates stated that files and some form of abrasive paper could be used to finish the edges but a lot used incorrect terminology. For example files were often called 'chisels' and the term 'glass paper' was much in evidence. It was the description of the actual process that would be carried out using these tools and equipment that let many candidates down and prevented them from gaining full marks.

**(b)(ii)** Most candidates understood what a template was, but some spent too long explaining how a template could be marked out and made rather than how it could be used. A high percentage of candidates described how the template could be used to mark out the location of the holes. Weaker answers suggested the use of a pencil or pen while the better ones stated that a scriber and Centre punch could be used. Fewer candidates explained that the template would need to be secured in place while the process was carried out. Almost all candidates made reference to some form of drill being used to make the holes. The major weakness in answers was again the failure to describe the actual process of drilling and the safety precautions involved.

**(b)(iii)** Some candidates did not answer this part. Of those that did, the majority stated an appropriate method for joining parts **A** and **B** together. The most common correct answers were riveting and welding. Again, many candidates did not describe the process, in this case joining, in sufficient detail to gain high marks.

Many candidates used far too much continuous text in their answers to this question and some produced no sketches at all.

## Question 2

This was the most popular question in this section of the paper.

**(a)** The majority of candidates named a suitable manufactured wooded sheet material for making the rack; some stated the names of natural timbers such as pine and teak. The most common correct answers were MDF or plywood.

Suitable reasons for choice included that the material was available in large sizes and provided a good surface for painting. As with **Question 1** answers need to relate to the use identified within the question, and general answers that could apply to many different materials are not acceptable.

**(b)(i)** Many candidates wasted time describing how the sides could be marked out, a process they were not asked to describe.

While almost all candidates showed at least some understanding of how the required shape could be cut out, some of the methods were not totally appropriate. For example, a circular saw would not be able cut round the corners and would have major safety implications. The better answers suggested the use of coping saws, jig saws, band saws or scroll saws. Rasps, files, and abrasive paper were the most common appropriate ways given for finishing the edges of the materials.

As with **Question 1** candidates frequently failed to describe the processes in detail, sometimes doing little more than to draw and/or name the tools and equipment to be used.

Some candidates included applying a painted finish as part of their answer to part **(b)(i)**, which was not required.

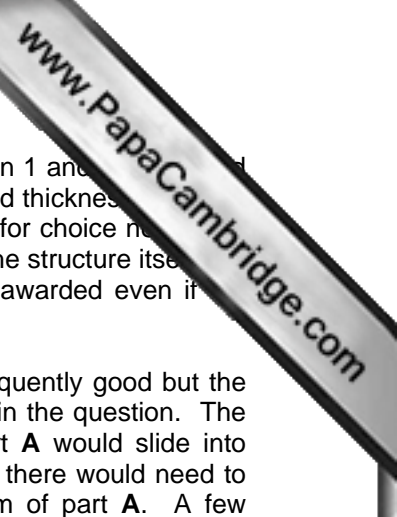
**(b)(ii)** A good number of candidates suggested permanent ways, such as mortise and tenon joints, for fixing the sides to parts **A** and **B**. Many of these answers made reference to the use of glue while still stating that it would be easy to take the pieces apart. Only very limited credit was given to responses of this type. The most common appropriate methods seen involved the use of screws or knock down fittings. The detail contained in candidates' responses varied from just a statement such as 'You would use screws' to answers that described stage by stage how the process would be carried out.

**(b)(iii)** Limited answers such as 'Using a paint brush' and 'You would spray it on' gained only 1 mark. Responses needed to go on to describe how the equipment would be used, to mention drying time, smoothing surfaces between coats, protective clothing and working in a ventilated area.

Many candidates used far too much continuous text in their answers to this question and some produced no sketches at all.

## Question 3

This was the least popular question in this section of the paper and in general was not well answered.



- (a) Only a limited number of candidates correctly stated that a thickness of between 1 and 2 mm would be a suitable thickness of card from which to make the leaflet holder. Suggested thicknesses of 1 mm up to, and in excess of 10 mm were much in evidence. Suitable reasons for choice normally relate to the strength/suitability of the card in terms of its ability to support both the structure itself and the weight of the leaflets placed in it. In a number of cases this mark was awarded even if the thickness of card suggested was not appropriate.
- (b)(i) This was, in general, poorly answered. The quality of communication was frequently good but the sketches produced often showed little more than a copy of the 3D view given in the question. The better answers used an exploded view to show how the slots shown in part **A** would slide into corresponding slots in part **B**. Only a limited number went on to describe that there would need to be a tab on the base of part **B** that went into the slot shown at the bottom of part **A**. A few candidates suggested that the parts could be glued together while others described how the parts would be cut out.
- (b)(ii) The majority of candidates understood what a stencil was and gained marks for describing how it could be marked out and then cut out. Most suggested an appropriate material such as card or thin plastic from which the stencil could be made, but inappropriate materials like MDF were also in evidence. In a limited number of cases candidates' incorrectly produced templates for drawing round rather than stencils. Fewer candidates went on to fully describe how the stencil would be used. A major omission was to fail to describe how the stencil would need to be fixed in place when it was being used. The use of paint brushes, spray paint and pens was often described well.
- (c) There were many basic errors and omissions in answers to this part. The required development needed to consist of four joined surfaces. Many candidates failed to include at least one of these surfaces, the base being the most common omission. Two slots and a tab should have been shown. While most drew the slots, fewer included the tab. Scale was a problem with some answers. While specific sizes were not looked for, adjacent edges did need to be the same length in order that the edges would match up when assembled.

### Section B

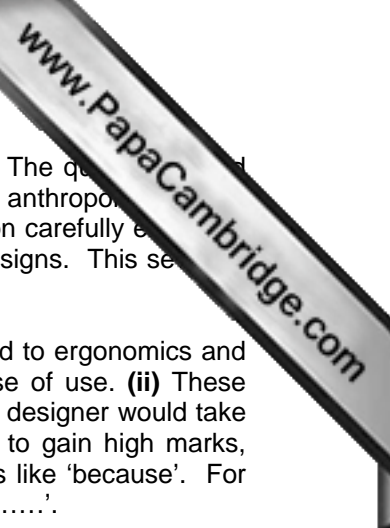
The major weakness in many answers continues to relate to the poor levels of 'discussion' that take place in candidates' responses. Candidates would be well advised to structure their answers around the instructions and mark allocation given in the questions. Candidates need to clearly identify relevant issues, discuss why they are important and be able to support their arguments and reasoning using appropriate examples and evidence. It is important that these issues are specific to the given situations and requirements of the question.

Repetition was seen in some candidates' answers particularly in part **(d)** of the questions where a frequent error was to give the same information two or more times using slightly different words. In a number of cases candidates did not attempt to complete part **(d)** of their chosen question.

### Question 4

This proved to be the most popular question in this section of the paper.

- (a) This was generally well answered. The majority of candidates were able to explain that parts **X** and **Y** improved the stability of frame and provided support for the top of the desk.
- (b) The vast majority of candidates were able to describe at least one problem with the design of frame **B**. Problems needed to be distinctly different and related to factors such as poor stability and weak support for the top. It is important that candidates do not just identify problems; they must go on to describe why it is a problem. For example: 'The frame is not stable (1 mark) because .....' (second mark). Some candidates described the same problem twice using slightly different words.
- (c) There were some good answers to this part, but some responses lacked the depth of explanation required to gain high marks. Brief answers such as 'You would add extra pieces' were sometimes seen. Answers needed to explain how and why this would solve the problem identified. The better answers made full and effective use of sketches to aid explanations.



(d) Many candidates did not make use of the structure provided in the question. The question asked candidates to 'Discuss how a designer would need to consider ergonomics and anthropometry when designing an office desk'. Perhaps as a result of not reading the question carefully a good percentage of candidates did little more than describe the three frame designs. This severely restricted the number of marks available to them.

(i) The better answers analysed the given situation and identified issues related to ergonomics and anthropometric data such as sizes linked to potential users, comfort and ease of use. (ii) These answers went on to explain why these issues were relevant and discuss how a designer would take them into consideration when designing an office desk in part (iii). In order to gain high marks, statements need to be justified and/or explained by making more use of words like 'because'. For example: 'A designer would need to consider ..... because .....'

### Question 5

(a) Many candidates gained one of the two marks available by identifying that the feature enabled the product to be hung up but fewer gained the second mark by going on to explain where or why you would need this. For example: 'To hang it (1 mark) on a display rack it in a shop (second mark).

(b) Almost all candidates described at least one problem with the design. These needed to link to the packaging not hanging straight and poor security for the MP3 player. For example: 'MP3 player could fall out of the bottom of the packaging (1 mark) because the bottom is not securely fixed' (second mark).

(c) Many answers were too short or simplistic to gain full marks. While candidates frequently identified appropriate solutions, fewer offered full explanations as to how these could be achieved. The better answers made very good use of sketches when describing solutions to the problems that had been identified.

(d) This part was frequently poorly answered with a good number of candidates failing to focus their responses around the requirements of the question. In these cases, candidates tended to give lots of general information about using a computer rather than structuring their answers on 'The merits of using CAD to model and test designs for packaging on a computer screen before manufacturing begins'.

(i) Candidates needed to analyse the situation and identify issues such as being able to save on the materials and time required to 'physically' make and test models of packaging and it being quicker to make changes and improvements without having to 'make the whole thing again'. (ii) Discussion then needed to take place to explain why these issues were important which in turn needed to lead on to justified conclusions about the merits of using CAD in the modelling and testing of packaging (iii).

There were a number of cases when candidates repeated in part (iii) what they had already said in part (ii) of the question. In questions of this type candidates need to make better use of the structure and mark allocation that they are given in the question.

### Question 6

This was the least popular of the questions in this section of the paper.

(a) This part was reasonably well answered, with most candidates showing at least some understanding that it was some form of knock down fitting or wedge that joined the ends and rails together and allowed for disassembly.

(b) The majority of candidates were able to describe at least one problem with the alternative design for the end of the desk. As with other questions in this section some candidates did not gain the second of the available marks because they 'stated' the problem' rather than 'describing' it. For examples statements such as 'It is not stable' needed to be followed by a description of why it was not stable, for example 'because there is very little surface area in contact with the floor'.

(c) Most candidates were able, at least in part, to explain how the problem they had identified in part (b) could be overcome. However, in common with other questions in this section, the explanations sometimes lacked the depth required to gain high marks. The better answers generally used

sketches as part of their explanation about modifications that would increase the amount of area in contact with the floor and make it easier to attach the rails and top to the ends.

- (d) This part was not very well answered. (i) Candidates needed to identify relevant issues such as lower costs, material available in large sizes and manufactured boards have better stability than solid timber. (ii) Candidates needed to explain and justify their choices. (iii) Candidates must use specific examples and/or evidence to support their arguments and/or conclusions. An example of this could be 'Manufacture boards are commonly used in the product of self assembly furniture they are particularly suitable for this purpose because .....'. Part (iii) must be based around, and make reference to, the issues identified and justified in (i) and (ii).

### Section C

While some excellent design work and presentation drawings were seen, there were some flaws in the way that some candidates responded to the requirements of the questions in this section. Common errors were to present only one idea or to produce several (in extreme cases up to five) drawings that gave the same information but in a different form. For example both a 2D view and a 3D view showing exactly the same design idea.

Ideas were frequently not evaluated in a meaningful way. Tables with 'star' ratings were much in evidence. While these are of some use, their value lies in the use of appropriate criteria and an indication about what the stars mean. It must be more than 'excellent, good and poor'. The better evaluations were those that used concise notes to clearly identify the strengths and weaknesses of designs. These notes need to include the justified choices that have been made.

Candidates should use quick, free-flowing sketches to produce around three distinctly different ideas for all or part of the product that they are designing in each part of the question. These should be evaluated, developed and design decisions made. Development should be seen as bringing together, and possibly improving, the best parts of a candidate's early design thinking into a proposed solution and not just re-drawing one of the ideas better. Some candidates tried to develop every one of their initial ideas.

Some candidates, unnecessarily, spent a long time producing very 'neat' drawings or explaining stage by stage how a design would be made. While basic details about materials, joining methods and important sizes are required candidates do not have to explain the whole production process.

In part (e) rendering was poor. A good deal of inappropriate 'colouring in' was seen. It should be remembered that rendering requires candidates to use colour, tonal shading and texture to enhance the three-dimensional appearance of a drawing and to represent the materials from which the product is made. A high-quality three-dimensional freehand sketch is perfectly acceptable in part (e).

Poor time management was an issue for some candidates. They spent too long on the earlier parts of the question leaving them with insufficient time to complete the whole question.

Errors of the type mentioned above severely restricted the number of marks available to some candidates.

### Question 7

This was the most popular question in this section of the paper.

- (a) Some of the best solutions showed telescopic systems that incorporated a locking system which enabled the side frames of the drawing table to extend and retract so that the top could be fixed at different heights. This was an example where a candidate could focus a section of their design work on just part of the product, in this case the locking system, rather than the whole adjusting mechanism.
- (b) This part required a design that allowed the top of the desk to be adjusted and fixed at different angles. As with part (a) a number of excellent answers were seen. A major omission in many answers, however, was the failure to include some form of hinge that would allow the top to pivot on the frame. Some candidates tried to produce over complex designs many of which would have been unsafe to use. In a few cases it was difficult to determine how a candidate intended their design to work. This was frequently because of poor quality sketching and a lack of clear notes. Candidates need to check their work to make sure that their design thinking is clear for the Examiner to understand.

- (c) Many candidates failed to take into account the type of drawing equipment that the student would need to hold as well as its shape and size. This frequently resulted in designs where this factor that had been considered was the outer shape of the tray. When producing any design it is important that candidates consider the product's function as well as its shape and form. Perhaps as a result of not reading the question fully some candidates included the requirements for part (d) as part of their response to this part of the question. Appropriate credit was given in these cases.
- (d) Almost all candidates who attempted this part produced designs that showed how the storage tray could be attached to the drawing desk. The better designs were those that did not require the use of additional equipment such as a screwdriver or spanner to attach or remove the tray from the desk. Some of the designs failed to show if the method of attachment would work when the desk was being used. For example some did not provide easy access to the tray while others would have fallen off or the equipment would have fallen out when the desk top was tilted. A few permanent ways of attaching the tray were incorrectly suggested.

Some excellent drawings were seen in part (e). However a few candidates traced the drawing given on the question sheet and some produced 2D rather than pictorial drawings. In a good number of cases rendering was not attempted or was poorly done. A number of 'multi coloured' drawings were seen, where each part of the desk was a different colour. Candidates need to be aware of the difference between 'colouring in' and 'rendering'.

### Question 8

Perhaps because they had not read the question carefully enough, a number of candidates based their answer on an actual house rather than it being an architectural model made from card. These resulted in some of their design work not being totally appropriate which in turn restricted the number of marks available to them.

The designs produced in parts (a)-(d) by the majority of candidates were too simplistic and lacked the level of detail to gain high marks.

- (a) Only a few good designs were seen. Some designs had the chimney in the wrong place while others did not feature a pitched roof. Many designs failed to consider that the roof would be made from card and that various developments (nets) would be required. Few answers included a feature that would allow the roof to be removed from and replaced on the rest of the building. Most designs only considered the shape of the roof.
- (b) Most answers only considered the shape of the staircase. Some designs were not totally practical and many had not taken into account the space and position that the staircase had to fit in. Only a limited number of answers showed any details about the developments (nets) required to make the designs being suggested.
- (c) Most designs showed only shapes for windows and doors; few considered how these could be attached to the rest of the card model so that they could open and close. Designs were frequently over elaborate with little thought being given to sizes such as the width of frames. As with other parts of the question, many answers were based on an actual house.
- (d) Most designs only considered the outer shape of the garage. Few answers included details about the development (nets) that would be needed to make the required shape, how the door could be made to open and close or how this part of the model could be attached to the main house.
- (e) Many answers were disappointing. While most of the drawings produced were pictorial the proportion of the various features was generally poor. In many cases the size of the windows and doors were too large. Some drawings were not cut-away and failed to include all of the details that had been designed. In particular the staircase was often not shown. Rendering was very poorly done with little or no attempt being made to use tonal shading. In a few cases candidates had traced the drawing given in the question.

### Question 9

This was the least popular of the questions in this section of the paper and was only answered by a small number of candidates. Of the candidates that did attempt the question, the vast majority showed a real understanding of the types of mechanism required in parts **(a)** and **(b)** of the question.

- (a)** This was very poorly answered. Most of the designs produced were far too complicated and most would not have worked. The quality of the sketching and the written communication were both generally weak.
- (b)** At least some of the ideas presented had the potential to work, but as with part **(a)** the work of the majority of candidates was let down by poor levels of sketching and written communication. In common with part **(a)** some candidates produced complicated often unworkable designs.
- (c)** As with parts **(a)** and **(b)**, most of the design work was weak and generally showed little understanding of what was required. Some designs involved separate containers to hold the balls, while other designs would have resulted in the balls falling out when the board was being carried. Poor levels of communication were again a feature of most candidates' work.
- (d)** The answers here were a little better than the other parts of the question but still generally weak. Again, most designs were too complicated; but at least some had the potential to adjust the board to different angles.
- (e)** Answers were generally poor often showing little detail. Rendering was not often attempted and when it was it consisted only of poor colouring in. Some candidates just traced the drawing given in Fig. 11.

# DESIGN AND TECHNOLOGY

Paper 9705/12

Written 1

## General Comments

The performance of candidates was very mixed and ranged from poor to the very good. It was evident that in a number of cases candidates had only limited knowledge and understanding of the subject matter required to respond correctly to the questions they had chosen to answer.

Time management proved to be a problem for some with a number of candidates failing to complete all of the parts of the questions they had chosen to answer. This particularly applied to **Section C**.

Some repetition was seen in candidates' answers to questions in all sections of the paper. Some drew the same thing more than once, for example a design would be drawn as a three dimensional view and then repeated using a two dimensional view that showed no more detail than the first drawing. A common error in written responses was for candidates to repeat the same point two or more times using slightly different words.

In some cases candidates had not read questions carefully or fully enough before starting their answers. This resulted in responses which did not address what was asked for in the question. Candidates must make sure that their answers are focused on the question being asked and that their responses are concise and display appropriate subject specific knowledge and understanding.

Candidates need to pay attention to how many marks are available for each part of a question, and structure their responses accordingly.

## **Section A**

The better answers in this section were those that used a sequence of three or four annotated sketches to describe clearly, step by step, how the appropriate tools, equipment and processes could be safely used to achieve the required results. It is not sufficient to just draw or list the tools; their use must be shown and described. The use of lots of continuous text should be avoided when answering questions in this section.

## **Question 1**

This proved to be one of the more popular questions in this section of the paper.

- (a) This was generally answered well. The majority of candidates produced a drawing showing different layers (1 mark) and had notes to explain that plywood was made from different layers of thin wood/veneers glued together (second mark).
- (b)(i) The majority of candidates understood what a template was. The better answers gained good marks by describing how a piece of card or other thin sheet material could be marked out, cut to shape and then drawn round to mark out the four sides. These answers gave details about the tools and equipment required and how they would be used.

While the weaker answers often identified some of the stages involved in the making of the template and its use as well as details about at least some of the tools and equipment to be used, they failed to describe the stages and how the tools would be used. Answers in this category often accompanied a drawing of, for example a craft knife, with notes such as 'You would use a craft knife to cut it out'. They failed to describe how the process would be carried out.



- (b)(ii)** While almost all candidates showed at least some understanding of how the required slots were to be cut out and the slots made, some of the methods were not totally appropriate. For example, some candidates suggested the use of handsaws, tenon saws and hacksaws for cutting the slots. While these would be suitable for cutting the sides, they would not be able to cut across the 4 mm width of the slots. The better answers identified more appropriate tools such as coping saws and scroll saws. Rasps, files and abrasive paper were the most common appropriate ways given for finishing the edges of the plywood. Only a very few candidates mentioned problems of splitting that can occur when working with plywood. The incorrect naming of tools was in evidence in some candidates' answers. As with part **(i)** the weaker responses failed to describe the processes in detail with some doing little more than to draw and/or name the tools and equipment to be used.
- (b)(iii)** Weak answers included 'Using a paint brush'. Answers of this type gained only 1 mark. Responses needed to go on to describe how the equipment would be used, to mention drying time, smoothing surfaces between coats, protective clothing and working in a ventilated area.

## Question 2

This was the least popular question in this section of the paper with only a very limited number of candidates choosing to answer it. In general, the question was not very well answered.

- (a)** Some candidates were able to identify a suitable metal, such as aluminium, for making the casting and gave a reason for their choice. Appropriate reasons needed to link to aspects such as it being weather resistant or having a melting point low enough to make it suitable for using in a school situation.
- (b)(i)** This was very poorly answered by the vast majority of candidates. Very few identified an appropriate material from which the pattern could be made. Some candidates suggested the pattern for part **B** should be made from a single piece which would have made it very difficult to cut out and shape the material to its required form. Many candidates failed to show that they had any real knowledge and understanding about how the required pattern could be made. The better answers described how the pattern could be fabricated from two pieces, but still, in the vast majority of cases, failed to explain the need to create a draft angle on the edges of the pattern.
- (b)(ii)** While many stated that casting involved the use of molten metal, many of the descriptions of the casting process failed to go far beyond this statement. Some of the processes that candidates tried to describe were totally inappropriate and in many cases would have been dangerous to carry out. However, a few very good answers were seen which described stage by stage how part **B** could be made using the sand casting process. These answers showed the required processes involved including how the sand would be packed around the pattern in moulding boxes, how runners and risers would be used and how the molten metal would be safely poured.
- (b)(iii)** Answers were often better than those to parts **(i)** and **(ii)**. A good number of candidates identified that holes would need to be made in parts **A** and **B** and a joining method such as a nut and bolt put through the holes to create the required 'hinge'. Answers were often let down by a failure to describe fully the processes required to achieve the outcome that had been identified. Statements such as 'Holes would need to be drilled' were frequently not supported by notes and sketches that described how this could be done.

## Question 3

While this proved to be a popular question in terms of the number of candidates who chose to answer it, very few candidates went on to attempt and/or complete all parts of the question.

- (a)** This part was very well answered by the vast majority of candidates. Most produced a high quality sketch supported by clear notes that explained that corrugated card consisted of two outer layers of card with a corrugated inner section.
- (b)** Many candidates identified that a slot and tab fixing could be used to join corners **A** and **B** of the tray together. However, some of the tabs shown would not have 'locked' into the slots resulting in the corners not being held securely together when the tray was assembled. Part of the tab needed to be wider than the slot in order to produce a secure method for joining the corners. The better responses used a series of annotated sketches that showed the slot and tab first on an 'open' corner and then on an 'assembled' corner. Some candidates did not attempt this part of the question.

- (c) Many candidates failed to produce the correct development (net) required to make the tray shown in Fig. 3. The correct development (net) needed to consist of five joined surfaces: a rectangle with a right angle triangle joined to each side. The orientation of the triangles needed to be correct in order to create corners **A** and **B**. A common error was to draw eight triangles, perhaps as a result of misreading the given orthographic drawing. In these cases, candidates drew the base correctly, then copied the end and front views from the given orthographic drawing and added these to the four sides of the rectangle. Some candidates did not attempt this part of the question.
- (d) Many candidates did not attempt this part. A few candidates understood that embossing involved 'stamping' or 'pressing' a design into paper or card to achieve a raised design, but were generally unable to describe how this type of surface finish could be achieved.

### Section B

The major weakness in many answers continues to relate to the poor levels of 'discussion' that take place in candidates' responses. Candidates would be well advised to structure their answers around the instructions and mark allocation given in the questions. Candidates need to clearly identify relevant issues, discuss why they are important and be able to support their arguments and reasoning using appropriate examples and evidence. It is important that these issues are specific to the given situations and requirements of the question.

Repetition was seen in some candidates' answers particularly in part (d) of the questions where a frequent error was to give the same information two or more times using slightly different words. In a number of cases candidates did not attempt to complete part (d) of their chosen question.

### Question 4

This proved to be the least popular of the questions in this section of the paper.

- (a) The majority of candidates were able to show at least some understanding of how the given knock-down fitting could be used to join two parts of the furniture. The better answers frequently used a 2D drawing to show a corner of the furniture with the assembled knock-down fitting holding the two surfaces together. Notes explained how the two parts of the fitting were bolted together and the fitting screwed to the furniture.
- (b) Candidates were able to identify at least one problem that a person might have when assembling a piece of knock-down furniture. These generally related to parts missing, poor instructions and not having the correct tools and equipment required.
- (c) Responses generally lacked the depth of explanation required to gain high marks. Brief responses such 'Give better instructions' were seen. Answers needed to go on to explain how and why this would solve the problem identified.
- (d) The candidates who had failed to make use of the structure and mark allocations given in the question frequently failed to fully meet the requirements of this part of the question.
- (i) The better answers showed that candidates had analysed the given situation and identified issues, such as: knock-down fittings enabled customers to assemble furniture and also take it apart; knock-down fittings were particularly suitable for use with manufactured boards and knock-down fittings could reduce the cost of producing furniture. (ii) These answers went on to explain and discuss why these issues were relevant. For example: 'Enabling customers to assemble and take apart furniture is a relevant issues because it enables them to transport and store the furniture easier'. 'Because' is a key word that candidates need to make more frequent use of when responding to questions of this type. Discussion needed to take place about, for example, the pros and cons of the issues that had been raised. (iii) Conclusions needed to be reached and justified by using examples and evidence that was contained in the question and/or came from the candidate's own experiences. Conclusions must be based around, and make reference to, the issues identified and justified in (i) and (ii).

### Question 5

This was the most popular question in this section of the paper.

- (a) The vast majority of candidates were able to explain that the design feature was a lever that enabled the chair to be raised and lowered.
- (b) Almost all candidates correctly identified a problem with the proposed design for a desk, and a high percentage went on to identify a second problem. The most common appropriate problems were linked to poor access to the keyboard, the monitor being too high and the chair and/or a person's legs not fitting under the desk. As with **Question 4** some candidates did not gain full marks because they did not fully describe the problem. For example: 'The chair or person's legs would not fit under the desk (1 mark) because there are two shelves in the way'. (second mark)
- (c) The better answers used sketches and notes to very good effect to explain how the problems identified in part (b) could be overcome. These showed how the design of the desk could be improved by shelves being removed or repositioned. Appropriate changes included removing the two shelves under the desk top and lowering the shelf for the monitor. Some answers showed how better access to the keyboard could be gained by putting it on a shelf that could slide in and out under the desk top. Notes needed to explain both the improvements and how they solved the problems with the original design.
- (d) The better answers were generally those where candidates had based their responses around the structure and mark allocations given in the question.
  - (i) Issues relating to comfort and ease of use were two of the more common identified by candidates in as having influenced the design of the chair. (ii) These answers went on to explain, with varying degrees of success, why these issues were relevant. For example the issue of comfort was frequently justified as being relevant by explaining that the person using the chair would be sitting in it for long periods of time. Discussion needed to talk about how well or badly the design of the chair addressed the issues identified by the candidate as having influenced its design. (iii) Conclusions needed to be reached and justified by using examples and evidence that was contained in the question and/or came from the candidate's own experiences. Conclusions should be based around, and make reference to, the issues identified and justified in (i) and (ii).

### Question 6

- (a) Less than half of candidates were able to explain that UV lacquer had been applied to the card for reasons such as, protecting the surface of the card, helping to keep it clean, making it easier to clean and to provide a shiny surface.
- (b) A high percentage of candidates identified at least one appropriate problem with the display stand and many went on to identify a second. However, a few candidates identified the same problem twice using slightly different words. Appropriate problems related to the poor stability of the design, the front part of the design folding down and not being able to see much of the phone when it was put in the holder. Having identified a problem the better answers went on to describe the problem in more detail. For example: 'The stand would not be stable because most of the weight would be at the front when the phone was put in the holder. This would make the stand tip forward.'
- (c) The better answers made very good use of annotated sketches to show how the problems that had been identified in part (b) could be overcome. Appropriate improvements included making the display stand tilt back by cutting the bottom of the supporting strut at an angle, adding a diagonal supporting piece to the central section of the stand and cutting away part of the front of the mobile phone holder. Notes needed to explain both the improvements and how they solved the problems with the original design.
- (d) The better answers were again those where candidates had based their responses around the structure and mark allocations given in the question. However, some candidates failed to focus their responses fully around the requirements of the question. In these cases candidates tended to give lots of general information about display stands and how they should be made from cheap materials using simple production processes

(i) Appropriate issues that the better answers identified: display stands are generally of a short period of time; they are a 'disposable item'; they are provided free by the manufacturer of the phone; they are used to promote a product and are not an item that would be sold to the public. Candidates needed to explain and discuss why the issues were relevant in the context of keeping manufacturing costs as low as possible. For example: 'The issue of manufacturers' supply of display stands to promote their products is relevant because the higher the costs involved in manufacturing the stands the lower the profit margins from selling the phones'. (iii) Conclusions needed to be reached and justified by using examples and evidence that was contained in the question and/or came from the candidate's own experiences. Conclusions should be based around, and make reference to, the issues identified and justified in (i) and (ii).

### Section C

The quality and quantity of work produced in this section of the paper was very mixed. While some excellent design work and presentation drawings were seen there were some fundamental errors in the way that some candidates responded to the requirements of the questions in this section. Common errors were to present only one idea or to produce several drawings that gave the same information but in a different form. For example both a 2D view and a 3D view showing exactly the same design idea.

Ideas were frequently not evaluated in a meaningful way. The better evaluations were those that used concise notes to clearly identify the strengths and weaknesses of designs. These notes need to include the justified choices that have been made.

Candidates should use quick, free-flowing sketches to produce around three distinctly different ideas for all or part of the product that they are designing in each part of the question. These should be evaluated, developed and design decisions made. Development should be seen as bringing together, and possibly improving, the best parts of a candidate's early design thinking into a proposed solution and not just re-drawing one of the ideas better. Some candidates tried to develop every one of their initial ideas.

Some candidates, unnecessarily, spent a long time producing very 'neat' drawings or explaining stage by stage how a design would be made. While basic details about materials, joining methods and important sizes are required candidates do not have to explain the whole production process.

Some candidates used far too much continuous text and produced very few design sketches.

In part (e) of the questions a number of candidates failed to render their drawings. Some inappropriate 'colouring in' was seen. It should be remembered that rendering requires candidates to use colour, tonal shading and texture to enhance the three dimensional appearance of a drawing and to represent the materials from which the product is made. A high-quality three-dimensional freehand sketch is perfectly acceptable in part (e).

Poor time management was an issue for some candidates. They spent too long on the earlier parts of the question leaving them with insufficient time to complete the whole question.

Errors of the type mentioned above severely restricted the number of marks available to some candidates.

### Question 7

This proved to be the most popular question in this section of the paper.

(a) A high number of potentially workable designs were seen, most of which used some form of rail system that went, at least partially, around the top bunk bed. However, many of the designs considered only the appearance of the proposed solution. Some designs failed to consider aspects such as access to the top bunk bed and safety features. At least some technical details are required, particularly at the development stage of a candidate's work. Basic details need to be given about materials, joining methods and important sizes. Most candidates had, to varying degrees, evaluated their design work.

(b) Most of the designs presented had the potential to work. Many detachable ladder designs were seen as well as ideas that changed the shape of the one end of the beds to produce a ladder that also formed part of the bed end. A limited number of over-complicated, impractical designs were seen. As with part (a) a good number of candidates went little further than to focus on the appearance of their 'ladder system'. The better responses went on to develop the ideas into a

workable solution that showed how the ladder would attach to the beds, incorporate safety features and gave at least some information about materials and joining methods. A frequent observation, common with other parts of the question, was not to give any details about size.

- (c) The vast majority based their ideas for a storage system on drawers or tubs. Some of the designs were attached to the bottom bunk while others rested on the floor; both of these types of systems were acceptable solutions to the problem. The weaker responses generally focused on the appearance of the storage system while the better answers went on to consider how the proposed system could be put on runners or wheels/castors to make it easier to pull it from under the bed. These answers frequently included some details about materials and joining methods.
- (d) Most of the designs presented had the potential to work. However, there were some ideas seen that would have been very difficult to operate and/or not safe to use. A common solution was to have holes in the ends of one bed with corresponding protruding 'pegs' on the ends of the other bed. While weaker solutions left the design like this the better solutions showed how this potential safety hazard could be overcome.
- (e) The quality of the drawings produced was variable with only a limited number of high-quality appropriately rendered illustrations. A few candidates produced 2D drawings rather than the pictorial view that was asked for in the question.

### Question 8

This proved to be the least popular question in this section, but was generally reasonably well answered.

- (a) Candidates produced a fair number of potentially workable designs. Some of the designs would have restricted the amount that the bicycle could have turned. The more appropriate solutions were those based on variations of a 'ball and socket' and those that involved a pin going through holes in a bracket on the bicycle and a hole in the towing bar attached to the trailer. It was the development stage that was a weakness in many candidates' responses. Many just chose one of their ideas and went no further with it. They frequently failed to include sufficient detail about the materials and joining methods that would be used for their final solution.
- (b) This was reasonably well answered with a number of candidates producing potentially workable designs for attaching the wheels to the axle of the trailer. The more common solutions showed a thread cut on the end of the axle with a nut preventing the wheel coming off. Most failed to develop their designs to include features such as a 'shoulder' on the axle to prevent too much movement of the wheel along the axle. A few candidates incorrectly suggest permanent joining methods.
- (c) A number of the designs proposed only had limited content, often focusing on just the shape and appearance of the trailer. Designs showing how the two parts of the trailer could be joined together were sometimes not included. The better designs frequently showed a cuboid top section with hooks around the bottom, and hooks around the top of the bottom section of the trailer. An elasticated cord was then shown holding the top and bottom sets of hooks together.
- (d) A number of designs failed to give sufficient details about the hinge mechanism that would be needed at the bottom of the fold down back and/or how the back would be secured in place when it was closed.
- (e) The quality of drawings produced was variable. While a few high-quality appropriately rendered illustrations were seen, some candidates had chosen to draw their final designs in a way that failed to show all of the features they had designed.

### Question 9

A number of candidates seemed not to have fully considered the size of the packaging when producing their designs for parts of this question.

- (a) This was generally well answered with a number of appropriate workable designs being proposed. The more common proposals included various forms of slot and tab fixings and 'stitching' the packaging together. The latter method involved making a series of holes around the edge of the packaging with cord going through the holes to hold the packaging together. Some of the slot and

tab fixings were too small for the size of the packaging required. Fold-over flaps with them in place was another effective method that was seen. A few candidates suggested ideas that involved the use of glue or tape, both of which would almost certainly have damaged the packaging when it was opened. The better candidates evaluated their work and developed their ideas into a proposed solution that included details about materials and joining methods. Few candidates gave any details about size.

- (b) A good number of candidates proposed solutions that involved a cut-out hole near the top of the packaging for a person's hand to go through in order to carry the packaging. The packaging was too large for this to have become a fully workable solution. The better solutions showed features that included holes lower down the packaging for a hand or arm to go through, straps that allowed the packaging to be carried over the shoulder and wheels that allowed the packaging to be pulled along by putting a hand through an appropriate hole in the packaging. While the latter was not strictly a method of 'carrying' it was allowed. The initial design ideas produced by candidates were generally of a good standard but answers were sometimes weak in the evaluation and development stages.
- (c) The shape of the packaging for the pedals and its location were both given in the question. Candidates had to design a development (net) for the packaging and a method of attaching it to the main packaging. The better answers showed one-piece developments which generally included one side that opened and tabs that would go into slots on the main packaging to hold the two parts together. Final solutions to this part of the question were best presented in the form of a development accompanied by a pictorial view of the assembled packaging.
- (d) Some outstanding design work was seen in this part. Many candidates produced a good range of lettering designs frequently linked to visual images of wild cats and in particular tigers. Most candidates made effective use of colour. Many developed their ideas into excellent final solutions.
- (e) Some very good, appropriately rendered, illustrations were seen. The better drawings gave a thickness to the card, had the lettering drawn at the correct angle and used tonal shading and texture to good effect. Some of the drawings produced would have been better had the candidates drawn them larger. This would have enabled some of the details of the design to have been shown more clearly.

# DESIGN AND TECHNOLOGY

Paper 9705/02

Project 1

## General comments

It is obvious from the way in which design folders are presented and written that many candidates become very involved in their Design and Technology project work, identifying design problems that are close to their own needs and producing outcomes that will be of use to themselves or others. This approach should be encouraged as the whole design process then becomes more meaningful to the candidate concerned.

Many interesting topics were considered again this year and outcomes of either models or final products included: portable lighting; drawing easel; watch tower; pet's activity centre; temperature monitor; curtain opening system; library steps; water supply systems; mobile ice cream parlour; cycle safety and security devices; back support; projector stand; robots; motor cycle loading ramp; drainage system; footbridge; tennis ball server; fair ground ride; scroll saw operating manual; map display board; car dashboard; golf clubhouse and vegetable slicer.

The Moderator would like to thank the majority of Centres for presenting work for moderation clearly labelled and with all documentation complete. Many had obviously encouraged their candidates to present design folders neatly and in such an order that the design process could be followed. It is also helpful when the photographic evidence of either the model or the final product is included at the appropriate part of the design folder.

## Comments on individual assessment criteria

### **1. Identification of a need or opportunity leading to a design brief**

It is important for the reader of a design folder to be able to identify the direction of the design process as soon as possible. This introductory section of the folder identifies the design problem and subsequent design brief.

Most candidates were aware of the need to include a detailed description of the need and to identify the intended user(s).

### **2. Analysis of and research into the design brief which results in a specification**

The majority of candidates did carry out some form of analysis of the topic being considered but this was not always a clear analysis of the design brief. Candidates need to consider all aspects of the use and purpose of the product that will satisfy the design need so that relevant data and information can be collected for use in the generation of design ideas. Most candidates considered existing products that might meet the need and identified some good and bad features of each.

The Moderator is pleased to report that fewer candidates than in previous years included information on materials, constructions, finishes and fittings, which is inappropriate at this stage of the design process.

Specifications were generally well written and many candidates realise that generic points are of little help when using the specification to evaluate a product at a later stage.

### **3. Generation and appraisal of design ideas**

Candidates should be congratulated on the range of ideas and high standard of communication techniques used in the presentation of design proposals. Where care is taken in this respect then it is easy to see how a candidate's thought process is developing.

It is important that different ideas are annotated with comments linked to the design specification. All important aspects of the need are considered. The intention is that candidates should record all ideas that come to them however practical or appropriate they appear at the time. These should then be appraised in an ongoing fashion so that other ideas can develop and be drawn together to form the final design solution.

#### **4. Modelling of ideas**

Modelling has a clear purpose in any design process and it is important that candidates give due care and attention to the quality of construction. Although materials used tend to be semi-resistant in nature there is no reason why high standards of manufacture should not be possible. Only when this has been achieved can high marks be awarded.

Where candidates know from the beginning of the project that modelling, such as an architectural model, is to form the final product then this should be stated in the specification, so that meaningful evaluation can be carried out later.

Centres are reminded of the need to include clear photographic evidence of all modelling undertaken so that the Moderator can verify the marks awarded.



# DESIGN AND TECHNOLOGY

Paper 9705/31

Written 2

## General comments

There was a wide range of responses to questions this year. There were many outstanding papers from candidates but unfortunately an increased number of candidates who made very little attempt at the paper.

Some answered only one question from **Section A** and made a very limited response to **Section B**.

Although there has been a general improvement in the effective use of time, a significant number of candidates fail to produce a final solution, with appropriate detail and an evaluation in **Section B**. Many candidates do not access the 20 marks that are available for the last part of the paper.

Rubric errors were very rare, with very few candidates answering more than the required number of questions.

The quality and use of appropriate sketching and annotation was good throughout the paper. Candidates described in detail the stages of particular processes, and used appropriate annotated diagrams to support their answers to questions in **Section A**. There were fewer exceptionally lengthy responses to **Section A** questions. Concise, clear and focused responses achieved high marks.

In **Section A**, **Part A** was again the most popular option with **Questions 1** and **3** the most popular. There was an even spread of responses in **Part B** and **Questions 7** and **9** were the most popular in **Part C**.

In **Section B**, **Question 10** was the most popular. Very few candidates attempted **Question 11**.

This report should be read in conjunction with the question paper and mark scheme.

## Comments on specific questions

### **Section A**

#### **Part A – Product Design**

##### **Question 1**

This was the most popular question in **Section A**. There were a wide variety of responses to this question. Stainless steel, acrylic and aluminium were the most popular materials proposed. A justification of why the material is suitable for the specific product is required to achieve full marks

Candidates described a range of appropriate manufacturing methods including vacuum forming, spinning and plug and yoke forming. Some methods described for part **(a)** were not appropriate for a prototype, one-off product.

Part **(b)** was generally answered well with industrial process such as injection moulding, and pressing methods clearly described. Each method needed to show in detail the appropriate mould or former to achieve the desired bowl shape.

##### **Question 2**

There were few detailed and full responses to this question. Many candidates were able to give appropriate reasons why drinks cans are suitable for mass production including the simplicity of design, very few components and ease of assembly. Demand for the product was the most popular correct response.

Similarly the range of styles and sizes were the most popular correct answers for why a design shoe would not be batch produced.

Most candidates were able to state at least two products designed to be one-off or single unit products such as large structures such as bridges, specialist bespoke furniture and individually designed jewellery.

Very few candidates achieved high marks for part **(d)**. The best answers included details of the cost and range of equipment required, the number of components and ease of assembly of the product and the skills required of the work force.

### **Question 3**

Compression moulding and extrusion were the most popular choices in this question. The use of annotated sketches was generally of a very good standard.

Most candidates clearly described the compression moulding procedure, making reference to the use of thermosetting plastic.

Many candidates incorrectly described a plastics extrusion system. Aluminium is not melted, the billet is pre-heated and forced through a die.

A few candidates correctly described the use of a table router or spindle-moulder to create the profile in hardwood.

### **Part B - Practical Technology**

#### **Question 4**

Relatively few candidates attempted this question. Some had a good understanding of material testing and achieved high marks.

Most referred specifically to the elastic region, elastic limit, ultimate tensile strength and fracture point. Others clearly described what happened to the material in each case and achieved full marks.

Only a few candidates identified relevant properties such as ductility and stiffness. Very few candidates described a simple test for torsion.

#### **Question 5**

The majority of candidates attempting this question achieved full marks for part **(a)** and **(b)**. Part **(c)** was not answered as well. Some candidates fully described the function and working of a relay and an LDR. The majority of candidates described only one of the four given.

#### **Question 6**

This was not a popular question. Some candidates used labelled sketches and diagrams effectively to clearly describe the mechanisms given, achieving very high marks. A few did not give a product that included the mechanism.

### **Part C – Graphic Products**

#### **Question 7**

This was a popular question, although there were relatively few responses achieving high marks. In many cases, candidates gave a brief description of the graphic term but did not explain when and why a designer would use them.

Surprisingly, very few candidates used sketches to show appropriate examples of use.

### **Question 8**

A small number of candidates attempted this question, most of them achieving high marks. candidates incorrectly used uniform acceleration and retardation for the rise.

The overall quality of construction of the profile and the clear presentation of the displacement diagram was most impressive.

### **Question 9**

There were some excellent responses to this question. The majority produced a good quality isometric view of the camera, with all details clearly shown. Some ignored the instruction relating to scale of drawing.

Some candidates rendered their drawing as required, giving the appearance of chrome and matt surface. The majority did not demonstrate appropriate technique.

### **Section B**

This Section was generally answered well by the vast majority of candidates.

The majority of candidates prepared their answers on A3 paper as instructed.

Many candidates do not achieve good marks on the analysis. A significant number still produced generic scatter-charts with no specific relevance to the problem.

This analysis should lead to justified specification points, e.g. the analysis of the stand to be used by visiting lecturers could have had some reference to cables and connections leading to a specification point 'the stand must have a means of securing cables so that they are not easily pulled out of the projector or laptop during the presentation'

Some candidates write out the full question and /or produce a design brief, which is not necessary.

The annotation of the exploration of ideas continues to improve. Most candidates produce a range of at least three discrete full design ideas with many candidates producing a range of solutions for key specification points.

Candidates made reference to specific materials, although a number only referred to one material. Reference to generic terms such as wood, plastic or metal do not achieve marks. It is recommended that candidates show their understanding of the appropriate use of a wider range (at least three) of appropriate materials.

Tick lists to identify a chosen solution are not always appropriate unless they are qualified. The higher marks are achieved when candidates give evaluative comments on ideas.

Some candidates do not develop their idea. They will describe a step by step stage of production which will gain marks for constructional detail only. Candidates who develop selected features, clearly showing their reasoning behind decisions will have access to the full range of marks. Most candidates comment on the changes and modifications needed for the development of a complete solution although some provide superficial development of features such as 'round off corners'.

Many proposed solutions were feasible and well presented. There was a significant improvement in the inclusion of detail such as dimensions, materials and finishes.

A significant number of candidates did not organize their time well and did not complete a final solution.

There was an improvement in the evaluation of the final solution where candidates described successful and unsuccessful elements of the design and gave details of improvements or modifications. A large number of candidates still provide a basic table for evaluation, using tick lists against specification points. In most cases this does not give a clear appraisal of the final product and does not access the full range of marks available.

### Question 10

This was generally well answered with a full range of responses to this question.

Acceptable specification points included:

- the stand must be stable so that the equipment will not easily fall off and be damaged.
- the stand must have a means of securing cables so that they are not easily pulled out of the projector or laptop during the presentation.
- the stand must be quickly assembled and disassembled as time may be short to set up or take down the equipment
- the stand must be adjustable to ensure that the projector can fill a screen at different heights
- the stand must allow easy access to the equipment by the user to ensure adjustment/set up can be easily carried out.

Candidates generated a range of different ideas, very few candidates produced exciting and innovative proposals.

Final proposals were generally realistic with most including details of materials or important dimensions.

### Question 11

Very few candidates attempted this question. Analysis and specifications were generally limited with only a few candidates considering the wider issues relating to the device.

Acceptable specification points included:

- the device must require a reasonable (not excessive) force to cut as it would be used by a range of users;
- the device could include a net to catch the fruit after cutting to avoid bruising;
- the device must be made out of materials that will resist corrosion as it will be used in outdoor conditions;
- the device could be built up of 2 or 3 sections so that it is not too long to store;
- the device must not have a mechanism that could trap fingers when in use, or the mechanism must be enclosed to prevent harm.

Some solutions were feasible and included simple mechanisms to provide a cutting action. Some candidates proposed solutions that would be far too heavy and unwieldy to operate.

### Question 12

This was a popular question with a full range of responses. Some candidates produced exciting and creative ideas, however many focused on slight variations of one idea. Very few candidates fully acknowledged the design requirements of holding a single fresh flower.

The analysis of most candidates tended to be generic with very few focusing on the specific task

Acceptable specification points included:

- the holder must not be too large and take up too much room as space may be limited on the table;
- the holder must allow the menu to be easily changed as menus may change daily/weekly;
- the holder must have a container to hold a small amount of water to keep a single flower fresh in a heated room;
- the appearance of the holder (name, logo and colour selection) must be in keeping with the high quality required of a good restaurant environment;
- the holder must be able to fold or stack for ease of storage.

Whilst some of the responses were of a very high quality, showing a range of innovative products, a significant number of candidates produced only a minimal range of very basic ideas.

Most candidates included a range of appropriate designs for the name and logo but ideas for the product tended to be limited.

A significant number of candidates do not show appropriate construction methods when using card.



# DESIGN AND TECHNOLOGY

Paper 9705/32

Written 2

## General comments

There was a full range of responses to questions on this paper. All candidates were well prepared and there were very few rubric errors.

The majority of candidates used the time available effectively and made full attempts at all sections of the paper.

The quality and use of appropriate sketching and annotation was very good throughout the paper. Candidates described the stages of particular processes, and used appropriate annotated diagrams to support their answers to questions in **Section A**.

Answers to **Section B** were generally good. Candidates are well prepared for this Section with virtually all candidates fully completing all elements. Some candidates produced lengthy, detailed responses but at the expense of limited and brief responses in **Section A**.

In **Section A**, **Part A** and **Part C** were the most popular, **Part B** marginally less so.

In **Part A**, **Question 2** was the most popular followed by **Question 1**. **Questions 4** and **5** the most popular in **Part B** and **Questions 8** and **9** the most popular in **Part C**.

In **Section B**, **Question 10** was the most popular. Very few candidates attempted **Questions 11** and **12**.

This report should be read in conjunction with the question paper and mark scheme.

## Comments on specific questions

### **Section A**

#### **Part A – Product Design**

##### **Question 1**

There were some very good attempts at this question with generally effective use of supporting annotated sketches. The majority of candidates stated appropriate materials and gave valid reasons. Some candidates stated reasons related to the material that did not relate to its use as a candleholder.

Most candidates described appropriate methods of manufacture but a significant number did not supply sufficient detail of the key stages of manufacture to achieve the higher mark range.

A number of candidates correctly described alternative quantity production methods; some of the best responses included simple changes to the design of the product to enable easier quantity production.

##### **Question 2**

The bath and the bookend were the most popular choices. Again, candidates made very good use of annotated sketches. Almost all candidates clearly described the vacuum forming process. The bookend and casting process tended to be brief and lacking technical detail.

Almost all candidates explained why the processes were suitable.

### Question 3

This was the least popular choice of question in **Part A**. There were some outstanding responses with written discussions covering a range of issues and including appropriate supporting evidence. Some candidates focused on one issue and gave limited responses. It is recommended that candidates produce a simple plan of their response to make sure that all aspects are covered.

### **Part B - Practical Technology**

#### Question 4

Relatively few candidates attempted this question with a wide range of responses. Some were too brief and focused on the process listed rather than safety issues. Some answers clearly described the full range of specific safety issues for the required number of processes.

#### Question 5

Most candidates attempting this question achieved good marks, showing a good understanding of materials and applications. Some candidates did not describe the specific properties that made the material suitable for the manufacture of the product.

#### Question 6

There were very few attempts at this question. Candidates were not able to define clearly the specific properties or describe simple tests for hardness or tensile strength.

### **Part C – Graphic Products**

#### Question 7

This was a popular question, with a number of very good responses. Many candidates presented high quality, fully correct elevations for part **(a)**

Part **(b)** was also answered particularly well. A few candidates lost marks by not focusing on storage and the transfer of design data.

#### Question 8

Most candidates who attempted this question were able to draw the isometric view correctly although some had difficulty in producing the isometric circle onto the sloping side.

Answers to part **(b)** were generally very good. Candidates had a good understanding of one and two point perspective and explained, using examples how designers would use it.

#### Question 9

This was generally very well answered. There were a number of excellent responses to this question. A wide range of different products was proposed and very detailed descriptions of developments and changes to the product, materials and processes used were given.

The use of annotated sketches to support was particularly good on this question.

### **Section B**

This Section was generally answered well by the vast majority of candidates.

The majority of candidates prepared their answers on A3 paper as instructed.

Some candidates did not achieve good marks on the analysis. A significant number still produced generic scatter-charts with no specific relevance to the problem.

This analysis should lead to justified specification points, e.g. the analysis of the product to enable a patient to eat a meal whilst in bed should include the need to take into account hygiene leading to a specification point 'the product must be easily cleaned (food spillage) to prevent a further health risk'

Most candidates produced a range of at least three discrete full design ideas with many candidates producing a range of solutions for key specification points.

Candidates made reference to specific materials, although a number only referred to one material. References to generic terms such as wood, plastic or metal do not achieve marks. It is recommended that candidates show their understanding of the appropriate use of a wider range (at least three) of appropriate materials.

Tick lists to identify a chosen solution are not always appropriate unless they are qualified. The higher marks are achieved when candidates give evaluative comments on ideas.

Some candidates do not develop their idea. They will describe a step by step stage of production which will gain marks for constructional detail only. Candidates who develop selected features, clearly showing their reasoning behind decisions will have access to the full range of marks. Most candidates comment on the changes and modifications needed for the development of a complete solution although some provide superficial development of features such as 'round off corners'.

Many proposed solutions were feasible and well presented. Most included detail such as dimensions, materials and finishes.

Evaluations were generally good. Many candidates described successful and unsuccessful elements of their design proposal and gave details of improvements or modifications.

### Question 10

This was by far the most popular question in this Section. It was generally well answered with a full range of responses to this question.

Acceptable specification points included:

- the product must be easily cleaned (food spillage) to prevent a further health risk
- the product must be adjustable to accommodate different patients
- the product must be easily stored as space may be limited in care homes
- the product must be easy to operate and adjust
- the product must be stable in use so as to prevent spillage of food and drink

Candidates generated a range of different ideas, very few candidates produced innovative proposals. Final proposals were generally realistic with most including details of materials or important dimensions.

### Question 11

No candidates attempted this question

### Question 12

There were a few responses to this question. Some candidates produced very exciting and creative ideas; others however focused on slight variations of one idea.

The analysis of most candidates tended to be generic with very few focusing on the specific task.

Acceptable specification points included:

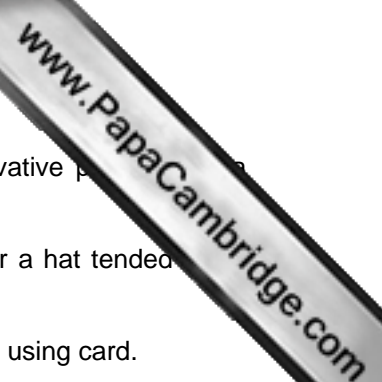
- the mask and hat must fit comfortably on the child and not fall off with activity
- the mask must offer clear vision and not impair sight
- the materials used must be robust to withstand party use
- the materials and finishes must not cause adverse skin reactions
- parts of the mask/hat must not be easily removed as smaller children may swallow them and choke



Whilst some of the responses were of a very high quality, showing a range of innovative proposals, a significant number of candidates produced only a minimal range of very basic ideas.

Most candidates included a range of appropriate designs for the mask but designs for a hat tended to be limited.

A significant number of candidates did not show appropriate construction methods when using card.



# DESIGN AND TECHNOLOGY

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**Paper 9705/04**

**Project 2**

## **5. Product Development**

The majority of candidates included much drawn and written information in this section of their design folders so that the reader could see details of the intended product and how it would be assembled and finished. As required, this usually included details of all materials, form and constructions to be used. Unfortunately there was often little evidence to indicate why these materials and methods had been chosen and if others were considered before making the final choice.

For the award of high marks candidates are also required to show that they have carried out some form of trialling or testing of some of these aspects. For example, successful candidates showed that they had tested materials or trialled alternative constructions before finalising their selections.

## **6. Product Planning**

The majority of candidates fulfilled successfully this requirement of their design folders, giving a sensible overall plan of the intended stages of manufacture together with clear working drawings of the product and a list of all materials and components to be used.

## **7. Product Realisation**

The made product forms the culmination and realisation of many hours of detailed design work for most candidates and it is always pleasing to see just how much care has been given to this stage of their project. It was obvious that many candidates had developed fairly advanced making skills whether this was through the use of resistant materials, graphic products, textiles or others. It was clear that most products were constructed and finished to the required standard for use and candidates should be congratulated on these successful outcomes.

Once again, the Moderator would like to remind Centres of the need to include clear and detailed photographic evidence of made products in line with the guidance set out in the syllabus document. Many candidates include photographs of the product in use and this is helpful to the Moderator. Centres are also reminded that on no account should they send models or final made products to CIE for moderation purposes.

## **8. Testing and Evaluation**

As was reported last year, the Moderator is pleased to see a continuing improvement in this section of design folders as more candidates carry out meaningful testing and evaluation. This can only be achieved if the product is put to the intended use and the results compared to the original design specification. It is always helpful when candidates include photographs of the product being tested in this way.

There is a temptation for candidates to simply produce a list of the specification points and then complete a tick box alongside when it is felt that a particular requirement has been met. This simple approach is insufficient for the award of high marks and candidates should be encouraged to evaluate critically with reasons and evidence to support their judgements.