DESIGN AND TECHNOLOGY

Paper 9705/11
Written 1

General Comments

In general, the performance of candidates showed an improvement over previous years. While some excellent answers were seen in all sections of the paper, responses were mixed.

The better responses were from those candidates who had looked at the number of marks available for each part of a question and produced answers which contained enough detail to give them full access to all of the marks available. In some cases, candidates had not read questions carefully or fully enough before starting their answers. This frequently resulted in responses that did not fully address what was asked for in the question. Some of the responses were too short, while others were too long. It was evident that in some cases, candidates displayed only a limited knowledge and understanding of the subject matter required to correctly respond to the questions they had chosen to answer.

Candidates can improve by making sure their answers are focused on the requirements of the question being asked, and produce responses which are concise and display appropriate subject specific knowledge and understanding.

The majority of candidates responded to all parts of the three questions they had chosen to answer. However, for some, time management proved a problem, particularly in ***Section C***.

Some repetition was evident in answers to questions in all sections of the paper. Some candidates 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 or information than the first drawing. A common error in written responses was for candidates to repeat the same information two or more times using slightly different words.

It is suggested that Centres make the content of this report available to future candidates, in order to help them avoid making similar mistakes and omissions.

Section A

General Comments

The better answers in this section were those that used a sequence of three or four annotated sketches to clearly describe, 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 required. Their correct use must be shown and described. The quality of sketching was generally good, but candidates need to understand that the use of lots of continuous text should be avoided when answering questions in this section of the paper.

The quality of sketching was generally of a good to very good standard.

Candidates could improve their performance in this section of the paper by initially spending a few minutes planning the sequence of stages that would be required to fully carry out the particular task or process identified in the question.

Comments on Individual Questions.

Question 1

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

Part **(a)(i)** was correctly answered by the vast majority of candidates with pine being the most common correct answer that was seen.

Only a limited number of candidates correctly answered part **(a)(ii)**. Most candidates incorrectly stated that PVA would be suitable for joining metal to wood.

In part **(b)(i),** almost all candidates showed at least some knowledge and understanding about how part **A** could be safely cut out and the edges of the material smoothed. Only a minority of candidates included the inner shape in their descriptions of the cutting and smoothing processes. A significant number of candidates spent too long describing how the shape could be marked out.

The better answers to part **(b)(ii)** described how two pieces of dowel could be cut to the correct length, and two holes drilled in each piece. These answers frequently went on to describe how a length of metal rod could be cut and then bent to form a right angle using a simple jig or a vice. The final stage was to drill holes in part **A** and glue the parts together. Only a limited number of responses described all of the required stages and processes. In some cases, candidates incorrectly tried to describe how the dowel could be made, rather than recognising that dowel is a standard stock material. Some candidates incorrectly tried to suggest that part **B** could be cut from a single piece of wood.

Most of the better answers to part **(b)(iii)** correctly described how the two rotor blades could be cut out, the edges of the plywood smoothed and a hole drilled in each one. They went on to describe how a wood screw could be used to join each of the rotor blades to part **A.** Some over complex answers were seen, most of which involved the use of nuts and bolts. A number of these solutions would have only partially worked. A significant number of answers showed only some of the stages and processes required to make the two rotor blades, and then attach them to part **A** in a way that allowed them to rotate.

Question 2

A number of the candidates who answered part **(a)** gained at least one of the two available marks by stating that malleable meant that the metal could be bent. In order to gain the second mark candidates needed to add that the metal would not rupture or crack when it was bent.

The better answers to part **(b)(i)** described the making and use of a jig, which consisted of a base board into which was inserted a number of pegs, around which the metal rod could be bent. Most responses often did not show sufficient details about the making and/or the use of the jig to gain high marks.

In part **(b)(ii),** the marking out of the wooden base was generally well explained. In some responses, only the outer circle was marked out. Most candidates went on to describe how the outer shape could be cut out and the edges of the wood smoothed to form the base. Fewer candidates went on to describe how the circular hole could be made in the base. Some responses did not contain sufficient detail about the safe use of appropriate tools and equipment to carry out the required process.

The better answers to part **(b)(iii)** described how either the angular spacing between each hole could be determined by dividing 360 degrees by 30, or how the measured distance between the holes could be worked out by dividing the circumference of the base by 30. Most responses did not include these details. The use of appropriate drilling equipment was generally reasonably well described, but details about how the correct angle of the holes would be ensured was not evident in the majority of answers.

Question 3

This was the least popular of the questions in this section of the paper. It was attempted by only a limited number of candidates and in general, apart from part (a), not answered very well.

The majority of candidates, who attempted part **(a),** successfully used a sketch and notes to show that 8 A5 cards could be cut from an A2 sheet of card.

Part **(b)(i)** was not answered very well. The better answers described how the mirror tool (or similar) could be used to complete the drawing of the lion. The majority of responses did not contain sufficient details about the appropriate use of CAD to gain high marks.

Part **(b)(ii)** was not generally answered very well. The better answers described how the card could be placed in a laminating pouch, and then passed through a laminating machine which applied heat to fuse the plastic together. It was acceptable for a candidate to have described how a clear sheet of tacky backed plastic sheet could be applied by hand to the card. The majority of responses did not contain sufficient details about an appropriate laminating process to gain high marks.

Similarly, part **b(iii)** was not generally very well answered. Only a very few candidates were able to display any real knowledge and understanding about how this type of pop-up card could be made. In some cases, candidates correctly described how the two smaller pieces of card could be cut out and folded. Very few candidates were able to show where the pieces would need to be glued, so the mouth of the lion would close when the card was opened.

Section B

General Comments

The questions in this section of the paper require candidates to analyse situations and products, identify and resolve problems and discuss issues related to the design, manufacture, use and disposals of products.

Parts **(a)**, **(b)** and **(c)** of the questions in this section of the paper were generally well answered by the majority of candidates. While the number of candidates making use of the structure and mark allocation given in part **(d)** continues to increase, the major weakness in many answers still relates to insufficient levels of ‘discussion’ that takes place in candidates’ responses.

Future candidates would be well advised to base their answers to part **(d)**, around the instructions and mark allocation given in the question.

In part **(d),** 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 using slightly different words.

In a limited number of cases, candidates did not attempt to complete part **(d)** of the question that they had chosen to answer in this section of the paper.

Comments on Individual Questions

Question 4

In part **(a),** only a very limited number of candidates correctly explained that the symbol indicated that the content (in grams or litres) of the bottle was an average quantity.

In part **(b),** a significant number of candidates correctly described at least one problem with the design of the tray. Problems had to relate to aspects such as the bottles could move around in the box, the side flaps could be seen through the plastic window when the box was closed, and the box had no method for keeping it closed securely.

The better answers to part **(c)** used notes and sketches to good effect, to explain how the design would need to be changed. Appropriate changes included adding partitions to the inside of the box, reducing the size of the flaps or the size of the plastic window or adding a slot and tab fixing to the top and front of the box. The majority of candidates gained at least half of the available marks, with the addition of some form of partitions being the most common change that was shown. In a limited number of cases, candidates incorrectly tried to totally re-design the box.

Part **(d)** of the question was, in the main, not answered well. Only a limited number of candidates made any real attempt to relate their responses to 'the significance of style and the influence of fashion when designing packaging for a new range of cosmetics aimed at the teenage market'. Many answers talked about packaging in far too general terms, and showed only limited knowledge or understanding of the terms 'style' and 'fashion'. Some of the better responses did make reference to famous personalities and how their appearance and the products they used may influence teenagers.

Question 5

A reasonable number of candidates gained one of the two available marks in part **(a)** by showing that they understood the symbol had something to do with registration, or not being able to copy the design. Only a very limited number gave a full explanation that said the symbol was a registered trade mark, indicating that the Tanalised logo had been registered with a national trademark office.

Part **(b)** provided candidates with the opportunity to show their knowledge and understanding of simple structures, fixtures and fittings. A significant number of candidates correctly described at least one problem with the design of the gate. Problems needed to relate to aspects, such as the gate was not a rigid or stable structure and its shape could easily become distorted and the gate was not attached to the gate posts, meaning that the gate would fall down. In a limited number of cases, candidates incorrectly suggested that the gate was too wide, or that people and animals could easily climb over or through it.

The better answers to part **(c)** used notes and sketches to good effect to explain how the design would need to be changed. Appropriate changes included adding one or more diagonal members to the gate, adding tee hinges and a bolt or another method of securing the gate in a closed position. A number of responses showed butt hinges being used to fix the gate to the gate post. This type of hinge was not considered to be appropriate in this situation but did gain some credit. Some candidates incorrectly suggested that major changes needed to be made to the design of the gate.

Part **(d)** of the question required candidates to 'Discuss how and why timber resources are being conserved'. While the majority of candidates focused their responses around this requirement, a significant number based their answers on the design of the given gate, or how the life span of timber could be increased (preserved) by treating it with varnish or another type of preservative. The better answers, identified issues linked with aspects such as global warming, deforestation, forest management and the increased use of manufactured boards. They went on to discuss why these issues were important, and to present examples/evidence to support any conclusions that were made.

Question 6

This proved to be by far the most popular of the questions in this section of the paper.

In part **(a)** the majority of candidates correctly identified that TM stood for trademark. Fewer went on to explain that a trademark was a name or symbol (in the case Highway Buses), that allows a customer to tell a company or business from its competitors, and it cannot be used in any form without permission.

In part **(b)** a good number of candidates correctly described at least one problem with the design of the bus shelter. Problems needed to relate to aspects such as the design was potentially a weak structure because the roof did not have enough support, poor drainage from the roof in wet weather because the roof was horizontal and no facilities for public such as seats and protection from the wind and rain. It is important that candidates both identify and describe problems. Some only identified them.

The better answers to part **(c)** used notes and sketches to good effect to explain how the design would need to be changed. Appropriate changes included adding additional support for the roof, making the roof slope and adding guttering and a down pipe, and proving a seat and enclosing at least some of the sides of the shelter. In order to gain high marks, candidates needed to include at least some basic details about materials and/or construction. Some candidates incorrectly suggested that major changes needed to be made and produced a design that was totally different to the one given in the question.

Part **(d)** required candidates to 'Discuss what a designer would need to consider when selecting which materials would be suitable for a new bus shelter'. While the majority of candidates focused their responses around this requirement, a significant number based their answers on the design of the given bus shelter. The better answers identified issues linked with aspects such as the durability or life span of the material, the strength of the material, and the need for it to be resistant to a wide variety of weather conditions. They went on to discuss why these issues were important and to present examples/evidence to support any conclusions that were made.

Section C

General Comments

Some excellent design work and presentation drawings were seen in this section of the paper.

The better answers showed the use of quick free flowing sketches to produce around three distinctly different ideas for all or part of the product that was being designed in each part of the question. Some candidates, unnecessarily, spent a long time producing very neat drawings of their initial ideas.

Some of the weaker responses presented only one idea, or produced several drawings that gave the same information but in a different form. For example, both a 2D view and 3D view showing exactly the same design idea.

The better evaluations were those that used concise notes to clearly identify the strengths and weaknesses of designs. They included justified choices, including which design or parts of a design to carry forward to the development stage.

Candidates need to understand that ideas must be evaluated in a meaningful way. For example, it is questionable how ideas can be evaluated by an ‘expert’ in an examination situation, but this was seen in a number of papers. Evaluation tables with ‘star’ or ‘number’ ratings were much in evidence. While these can be used to good effect, their value lies in the use of headings appropriate to an examination situation, and an indication about what the stars or numbers mean. It must be more than ‘excellent, good or poor’. Some candidates did not evaluate their ideas at all.

For each of the parts **(a)-(c),** it is important that there is clear evidence that design development has taken place. This should show how the candidate has brought the best parts of their initials ideas into a developed solution for each part of the question. This developed solution should be annotated, to give details about materials, joining methods and important sizes. Candidates are not required to describe, stage by stage, how a design could be made. Marks cannot be awarded for design development, where a candidate has simply chosen one of their ideas and redrawn it.

A significant number of excellent rendered pictorial drawings were seen in part **(d)**. However, in some responses, the rendering was not attempted or was unsatisfactory. A number of ‘multi coloured’ drawings were seen where each part of the product was a different colour. Candidates need to be aware of the difference between ‘colouring in’ and ‘rendering’. Rendering should be used to suggest the form (shape) of the product and the material(s) that it is made from.

Comments on Individual Questions

Question 7

This proved to be the most popular question in this section of the paper and some excellent responses were seen to all parts of the question. In general, both the quality of sketching and written communication was of a good standard.

In part **(a)** of the question, the majority of candidates produced appropriate designs for a shade for the adjustable lamp. In some cases, the designs presented were over complex and/or more suited for a light fitting that would hang from a ceiling. The better solutions often included details about how a bulb could be fixed into the shade and how the shade could be attached to the arm. Some responses only considered the shape of the shade and gave few, if any, technical details about the proposed design. Candidates could improve their performance by giving appropriate details about materials, joining methods and important sizes.

Part **(b)** was often well answered, with many candidates producing a design for an arm that had the potential to meet the requirements of the question. The better responses were frequently those that showed some form of adjustable fixing that passed through the hole in the top of part **X**. It was not always clear in the responses of some candidates how the arm would be attached, and/or how the arm would be adjusted. Some over complex designs were seen.

Part **(c)** required a design which allowed the lamp to be clamped to the table. The design had to include a way of joining the clamping device to part **X** and allow it to rotate. Almost all candidates produced a design showing how the lamp could be clamped to the table. Fewer designs were seen which showed how part **X** could be joined to the clamping device and even fewer showed how the lamp would be free to rotate. In common with parts **(a)** and **(b)** of the question, some over complex designs were seen.

A good number of excellent rendered pictorial drawings were seen in part **(d)**. However in some responses the rendering was not attempted or was unsatisfactory. It is important that the pictorial drawing includes all of the features that have been designed in parts **(a)-(c)**. This part of the question clearly stated that the table should not be included in the drawing. A limited number of candidates did include the table in their drawing and as a result were not able to show full details of the clamping device they had designed in part **(c)**. This prevented them from having full access to all of the marks available in this part of the question.

Question 8

The better responses to part **(a)** included details about the appearance of the final box and the one piece development required to make the box. The majority of candidates focused far more on the appearance of the box than on the development required. Some incorrectly suggested that the shape of the box should be changed. A number of these designs would not have held four of the cakes. Errors of this type emphasise the importance of fully reading questions.

The quality of the designs produced in part **(b)** was variable. The better responses developed designs for lettering styles which reflected the name ‘Chris’s Cakes’, by incorporating the cake design (or something similar) shown in Fig. 8 into the lettering. Only a limited number of responses gave any real consideration to colour, where the lettering would be placed on the box and the fact that the design would be printed using a rubber stamp. It is important that candidates read all parts of a question so that they realise how parts **(a)-(c)** of the question link together to produce the final solution to be illustrated in part **(d)**.

Most of the designs produced in part **(c)** showed that candidates had given at least some consideration to the fact that the rubber stamp needed to be comfortable and easy to hold. Very few candidates showed that the lettering on the stamp would need to be reversed in order for the correct print to be achieved. In some cases only the shape of the rubber stamp was considered with responses containing little or no technical detail.

The quality of the drawings produced in part **(d)** was very mixed, with only a limited number of high quality rendered drawings being seen. Some of the drawings did not show all of the features that had been designed in parts **(a)-(c)**. Common omissions included not showing the lettering, showing the box closed rather than open and not drawing the rubber stamp. It is important that on drawings of this type, card is given a thickness and not drawn as a single line.

Question 9

In general, this question was not very well answered. Lots of information about the play house in the form of a toy shop was given in Fig. 9. A good number of the candidates that attempted this question did not make full and effective use of this information. It is important that candidates fully read and study all of the information given in a question before they start their response.

Most of the designs produced in part **(a)** had the potential to work. A design was required which enabled the four sides of the shop to be joined together and taken apart without the use of tools. Designs such as the use of housing joints and finger joints were commonly seen but while the four pieces of MDF could slot together there was nothing to secure them while the toy shop was being used by children. One of the more successful solutions that were seen was the use of hooks and eyes.

Answers to part **(b)** needed to show:

- how the letters could be easily attached to and removed from side A without the use of any tools;
- how the top part of the opening section could fold up and be held in a vertical position;
- how the bottom part of the opening section could fold down and be fixed in a horizontal position to make a sales counter.

This question gave candidates the opportunity to show their knowledge and understanding of various fixtures, fittings and components. The better responses showed, for example, how Velcro and hooks and eyes could be used to attach the lettering to side A. Hinges, stays and lengths of rope were ways that were correctly suggested by some candidates for the opening part of side A.

The majority of candidates did not fully address the requirements of the question and attempted to totally redesign the shape of side A.

The better answers to part **(c)** showed how the use of appropriate fixtures, fittings and components could be used to achieve the design required for side B. As with part **(b),** the majority of candidates did not fully address the requirements of the question and attempted to totally redesign the shape of side B.

The quality of the drawings produced in part **(d)** was very mixed with only a limited number of high quality rendered drawings being seen. Some of the drawings did not show all of the features that had been designed in parts **(a)-(c)**. The most common omission was not to show any details about how any of the parts of the design joined together. For example, the drawings could have been improved by showing the doors and windows open and including details of hinges etc. One side of the toy shop could have been exploded in order to clearly show the joining method. It is important that material is given a thickness and not drawn as a single line.

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In general, the performance of candidates showed an improvement over previous years. While some excellent answers were seen in all sections of the paper, responses were mixed.

The better responses were from those candidates who had looked at the number of marks available for each part of a question and produced answers which contained enough detail to give them full access to all of the marks available. In some cases, candidates had not read questions carefully or fully enough before starting their answers. This frequently resulted in responses that did not fully address what was asked for in the question. Some of the responses were too short, while others were too long. It was evident that in some cases, candidates displayed only a limited knowledge and understanding of the subject matter required to correctly respond to the questions they had chosen to answer.

Candidates can improve by making sure their answers are focused on the requirements of the question being asked, and produce responses which are concise and display appropriate subject specific knowledge and understanding.

The majority of candidates responded to all parts of the three questions they had chosen to answer. However, for some, time management proved a problem, particularly in ***Section C***.

Some repetition was evident in answers to questions in all sections of the paper. Some candidates 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 or information than the first drawing. A common error in written responses was for candidates to repeat the same information two or more times using slightly different words.

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Section A

General Comments

The better answers in this section were those that used a sequence of three or four annotated sketches to clearly describe, 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 required. Their correct use must be shown and described. The quality of sketching was generally good, but candidates need to understand that the use of lots of continuous text should be avoided when answering questions in this section of the paper.

The quality of sketching was generally of a good to very good standard.

Candidates could improve their performance in this section of the paper by initially spending a few minutes planning the sequence of stages that would be required to fully carry out the particular task or process identified in the question.

Comments on Individual Questions.

Question 1

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

Part **(a)(i)** was correctly answered by the vast majority of candidates with pine being the most common correct answer that was seen.

Only a limited number of candidates correctly answered part **(a)(ii)**. Most candidates incorrectly stated that PVA would be suitable for joining metal to wood.

In part **(b)(i),** almost all candidates showed at least some knowledge and understanding about how part **A** could be safely cut out and the edges of the material smoothed. Only a minority of candidates included the inner shape in their descriptions of the cutting and smoothing processes. A significant number of candidates spent too long describing how the shape could be marked out.

The better answers to part **(b)(ii)** described how two pieces of dowel could be cut to the correct length, and two holes drilled in each piece. These answers frequently went on to describe how a length of metal rod could be cut and then bent to form a right angle using a simple jig or a vice. The final stage was to drill holes in part **A** and glue the parts together. Only a limited number of responses described all of the required stages and processes. In some cases, candidates incorrectly tried to describe how the dowel could be made, rather than recognising that dowel is a standard stock material. Some candidates incorrectly tried to suggest that part **B** could be cut from a single piece of wood.

Most of the better answers to part **(b)(iii)** correctly described how the two rotor blades could be cut out, the edges of the plywood smoothed and a hole drilled in each one. They went on to describe how a wood screw could be used to join each of the rotor blades to part **A**. Some over complex answers were seen, most of which involved the use of nuts and bolts. A number of these solutions would have only partially worked. A significant number of answers showed only some of the stages and processes required to make the two rotor blades, and then attach them to part **A** in a way that allowed them to rotate.

Question 2

A number of the candidates who answered part **(a)** gained at least one of the two available marks by stating that malleable meant that the metal could be bent. In order to gain the second mark candidates needed to add that the metal would not rupture or crack when it was bent.

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In part **(b)(ii),** the marking out of the wooden base was generally well explained. In some responses, only the outer circle was marked out. Most candidates went on to describe how the outer shape could be cut out and the edges of the wood smoothed to form the base. Fewer candidates went on to describe how the circular hole could be made in the base. Some responses did not contain sufficient detail about the safe use of appropriate tools and equipment to carry out the required process.

The better answers to part **(b)(iii)** described how either the angular spacing between each hole could be determined by dividing 360 degrees by 30, or how the measured distance between the holes could be worked out by dividing the circumference of the base by 30. Most responses did not include these details. The use of appropriate drilling equipment was generally reasonably well described, but details about how the correct angle of the holes would be ensured was not evident in the majority of answers.

Question 3

This was the least popular of the questions in this section of the paper. It was attempted by only a limited number of candidates and in general, apart from part (a), not answered very well.

The majority of candidates, who attempted part **(a),** successfully used a sketch and notes to show that 8 A5 cards could be cut from an A2 sheet of card.

Part **(b)(i)** was not answered very well. The better answers described how the mirror tool (or similar) could be used to complete the drawing of the lion. The majority of responses did not contain sufficient details about the appropriate use of CAD to gain high marks.

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Similarly, part **b(iii)** was not generally very well answered. Only a very few candidates were able to display any real knowledge and understanding about how this type of pop-up card could be made. In some cases, candidates correctly described how the two smaller pieces of card could be cut out and folded. Very few candidates were able to show where the pieces would need to be glued, so the mouth of the lion would close when the card was opened.

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In part **(a)** the majority of candidates correctly identified that TM stood for trademark. Fewer went on to explain that a trademark was a name or symbol (in the case Highway Buses), that allows a customer to tell a company or business from its competitors, and it cannot be used in any form without permission.

In part **(b)** a good number of candidates correctly described at least one problem with the design of the bus shelter. Problems needed to relate to aspects such as the design was potentially a weak structure because the roof did not have enough support, poor drainage from the roof in wet weather because the roof was horizontal and no facilities for public such as seats and protection from the wind and rain. It is important that candidates both identify and describe problems. Some only identified them.

The better answers to part **(c)** used notes and sketches to good effect to explain how the design would need to be changed. Appropriate changes included adding additional support for the roof, making the roof slope and adding guttering and a down pipe, and proving a seat and enclosing at least some of the sides of the shelter. In order to gain high marks, candidates needed to include at least some basic details about materials and/or construction. Some candidates incorrectly suggested that major changes needed to be made and produced a design that was totally different to the one given in the question.

Part **(d)** required candidates to 'Discuss what a designer would need to consider when selecting which materials would be suitable for a new bus shelter'. While the majority of candidates focused their responses around this requirement, a significant number based their answers on the design of the given bus shelter. The better answers identified issues linked with aspects such as the durability or life span of the material, the strength of the material, and the need for it to be resistant to a wide variety of weather conditions. They went on to discuss why these issues were important and to present examples/evidence to support any conclusions that were made.

Section C

General Comments

Some excellent design work and presentation drawings were seen in this section of the paper.

The better answers showed the use of quick free flowing sketches to produce around three distinctly different ideas for all or part of the product that was being designed in each part of the question. Some candidates, unnecessarily, spent a long time producing very neat drawings of their initial ideas.

Some of the weaker responses presented only one idea, or produced several drawings that gave the same information but in a different form. For example, both a 2D view and 3D view showing exactly the same design idea.

The better evaluations were those that used concise notes to clearly identify the strengths and weaknesses of designs. They included justified choices, including which design or parts of a design to carry forward to the development stage.

Candidates need to understand that ideas must be evaluated in a meaningful way. For example, it is questionable how ideas can be evaluated by an 'expert' in an examination situation, but this was seen in a number of papers. Evaluation tables with 'star' or 'number' ratings were much in evidence. While these can be used to good effect, their value lies in the use of headings appropriate to an examination situation, and an indication about what the stars or numbers mean. It must be more than 'excellent, good or poor'. Some candidates did not evaluate their ideas at all.

For each of the parts **(a)-(c),** it is important that there is clear evidence that design development has taken place. This should show how the candidate has brought the best parts of their initials ideas into a developed solution for each part of the question. This developed solution should be annotated, to give details about materials, joining methods and important sizes. Candidates are not required to describe, stage by stage, how a design could be made. Marks cannot be awarded for design development, where a candidate has simply chosen one of their ideas and redrawn it.

A significant number of excellent rendered pictorial drawings were seen in part **(d)**. However, in some responses, the rendering was not attempted or was unsatisfactory. A number of 'multi coloured' drawings were seen where each part of the product was a different colour. Candidates need to be aware of the difference between 'colouring in' and 'rendering'. Rendering should be used to suggest the form (shape) of the product and the material(s) that it is made from.

Comments on Individual Questions

Question 7

This proved to be the most popular question in this section of the paper and some excellent responses were seen to all parts of the question. In general, both the quality of sketching and written communication was of a good standard.

In part **(a)** of the question, the majority of candidates produced appropriate designs for a shade for the adjustable lamp. In some cases, the designs presented were over complex and/or more suited for a light fitting that would hang from a ceiling. The better solutions often included details about how a bulb could be fixed into the shade and how the shade could be attached to the arm. Some responses only considered the shape of the shade and gave few, if any, technical details about the proposed design. Candidates could improve their performance by giving appropriate details about materials, joining methods and important sizes.

Part **(b)** was often well answered, with many candidates producing a design for an arm that had the potential to meet the requirements of the question. The better responses were frequently those that showed some form of adjustable fixing that passed through the hole in the top of part **X**. It was not always clear in the responses of some candidates how the arm would be attached, and/or how the arm would be adjusted. Some over complex designs were seen.

Part **(c)** required a design which allowed the lamp to be clamped to the table. The design had to include a way of joining the clamping device to part **X** and allow it to rotate. Almost all candidates produced a design showing how the lamp could be clamped to the table. Fewer designs were seen which showed how part **X** could be joined to the clamping device and even fewer showed how the lamp would be free to rotate. In common with parts **(a)** and **(b)** of the question, some over complex designs were seen.

A good number of excellent rendered pictorial drawings were seen in part **(d)**. However in some responses the rendering was not attempted or was unsatisfactory. It is important that the pictorial drawing includes all of the features that have been designed in parts **(a)-(c)**. This part of the question clearly stated that the table should not be included in the drawing. A limited number of candidates did include the table in their drawing and as a result were not able to show full details of the clamping device they had designed in part **(c)**. This prevented them from having full access to all of the marks available in this part of the question.

Question 8

The better responses to part **(a)** included details about the appearance of the final box and the one piece development required to make the box. The majority of candidates focused far more on the appearance of the box than on the development required. Some incorrectly suggested that the shape of the box should be changed. A number of these designs would not have held four of the cakes. Errors of this type emphasise the importance of fully reading questions.

The quality of the designs produced in part **(b)** was variable. The better responses developed designs for lettering styles which reflected the name 'Chris's Cakes', by incorporating the cake design (or something similar) shown in Fig. 8 into the lettering. Only a limited number of responses gave any real consideration to colour, where the lettering would be placed on the box and the fact that the design would be printed using a rubber stamp. It is important that candidates read all parts of a question so that they realise how parts **(a)-(c)** of the question link together to produce the final solution to be illustrated in part **(d)**.

Most of the designs produced in part **(c)** showed that candidates had given at least some consideration to the fact that the rubber stamp needed to be comfortable and easy to hold. Very few candidates showed that the lettering on the stamp would need to be reversed in order for the correct print to be achieved. In some cases only the shape of the rubber stamp was considered with responses containing little or no technical detail.

The quality of the drawings produced in part **(d)** was very mixed, with only a limited number of high quality rendered drawings being seen. Some of the drawings did not show all of the features that had been designed in parts **(a)-(c)**. Common omissions included not showing the lettering, showing the box closed rather than open and not drawing the rubber stamp. It is important that on drawings of this type, card is given a thickness and not drawn as a single line.

Question 9

In general, this question was not very well answered. Lots of information about the play house in the form of a toy shop was given in Fig. 9. A good number of the candidates that attempted this question did not make full and effective use of this information. It is important that candidates fully read and study all of the information given in a question before they start their response.

Most of the designs produced in part **(a)** had the potential to work. A design was required which enabled the four sides of the shop to be joined together and taken apart without the use of tools. Designs such as the use of housing joints and finger joints were commonly seen but while the four pieces of MDF could slot together there was nothing to secure them while the toy shop was being used by children. One of the more successful solutions that were seen was the use of hooks and eyes.

Answers to part **(b)** needed to show:

- how the letters could be easily attached to and removed from side A without the use of any tools;
- how the top part of the opening section could fold up and be held in a vertical position;
- how the bottom part of the opening section could fold down and be fixed in a horizontal position to make a sales counter.

This question gave candidates the opportunity to show their knowledge and understanding of various fixtures, fittings and components. The better responses showed, for example, how Velcro and hooks and eyes could be used to attach the lettering to side A. Hinges, stays and lengths of rope were ways that were correctly suggested by some candidates for the opening part of side A.

The majority of candidates did not fully address the requirements of the question and attempted to totally redesign the shape of side A.

The better answers to part **(c)** showed how the use of appropriate fixtures, fittings and components could be used to achieve the design required for side B. As with part **(b),** the majority of candidates did not fully address the requirements of the question and attempted to totally redesign the shape of side B.

The quality of the drawings produced in part **(d)** was very mixed with only a limited number of high quality rendered drawings being seen. Some of the drawings did not show all of the features that had been designed in parts **(a)**-**(c)**. The most common omission was not to show any details about how any of the parts of the design joined together. For example, the drawings could have been improved by showing the doors and windows open and including details of hinges etc. One side of the toy shop could have been exploded in order to clearly show the joining method. It is important that material is given a thickness and not drawn as a single line.

DESIGN AND TECHNOLOGY

Paper 9705/13

Written 1

General Comments

The performance of candidates was very mixed and ranged from the very good to unsatisfactory.

The better answers were from those candidates who had looked at how many marks were available for each part of a question and produced responses which contained sufficient detail and information to give them full access to all of the marks available. In some cases, candidates had not read questions carefully or fully enough before starting their answers. This frequently resulted in responses which did not address what was asked for in the question. Some of the responses were too short, while others were too long. It was evident that in some cases, candidates displayed only a limited knowledge and understanding of the subject matter required, to correctly respond to the questions they had chosen to answer.

Candidates can improve by making 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.

While the majority of candidates responded to all parts of the three questions they had chosen to answer, time management proved a problem for some. This particularly applied to ***Section C***.

Some repetition was evident 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.

It is suggested that Centres make the content of this report available to future candidates in order to help them avoid making similar and omissions.

Section A

The better answers in this section were those that used a sequence of three or four annotated sketches to clearly describe, 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.

As in previous years, the quality of sketching was variable.

In some of the weaker responses, a number of very small and inadequately produced sketches were seen. Candidates need to understand that the use of a large section of continuous text should be avoided when answering questions in this section of the paper. In a number of responses, far too much use had been made of continuous text often accompanied by very few, if any, sketches.

Candidates could improve their performance in this section of the paper, by initially spending a few minutes planning the sequence of stages that would be required to fully carry out the particular task or process identified in the question.

Comments on Individual Questions

Question 1

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

In part **(a),** the vast majority of candidates were able to give at least one appropriate reason why part **A** was made from acrylic rather than glass. Appropriate reasons were that acrylic was easier to cut than glass in a School situation and that acrylic was safer to use because it did not break as easily as glass.

The better answers to part **(b)(i)** were those that described (with varying degrees of success), the use of a router or a plough plane to make the grooves in the wooden frame. Less appropriate methods such as the use of saws and chisels and a table saw (potentially very dangerous) were much in evidence. A number of responses were let down by the unsatisfactory quality of the sketches (or the lack of them), and the use of too much continuous text.

In their responses to part **(b)(ii),** the majority of candidates were able to display at least some knowledge and understanding about what a dowel joint was and how it could be made. The better responses described how holes would be drilled in parts **A** and **B**, how a piece of dowel could be cut to size, and a slit cut along its length, and finally how the parts could be glued together. Very few candidates described how to ensure that the holes were drilled vertically. A number of responses were let down by poor quality sketches (or the lack of them), and the use of too much continuous text.

Some candidates did not attempt part **(b)(iii)** of this question.

The better responses described how a piece of pine could be prepared and then fixed onto a wood turning lathe. These responses went on to describe (with varying degrees of success), how turning gouges and turning chisels could be used to achieve the required shape. While most responses showed some knowledge and understanding of the required process, few answers contained sufficient detail to gain high marks. Some very good drawings of a wood turning lathe were seen, but in common with other parts of this question, some responses were let down by the unsatisfactory quality of the sketches (or the lack of them), and the use of too much continuous text.

Question 2

This question was attempted by only a limited number of candidates.

The better answers to part **(a)** named a suitable finish such as paint, and went on to give an appropriate reason for the choice, such as it improved the appearance, protected the surface and helped to prevent rust. In a number of cases, candidates incorrectly tried to explain how the edges and/or surface of the metal could be smoothed using files and abrasive paper.

Responses to part **(b)(i)** frequently showed that candidates had some knowledge and understanding about how the required processes could be carried out. In most cases, candidates described (for example) how a hole would need to be drilled, a metal cutting saw put through it and the hole cut out. The edges of the metal could then be smoothed using files and abrasive paper. Many descriptions were superficial and did not contain sufficient detail to gain high marks. Some responses were let down by the unsatisfactory quality of the sketches (or the lack of them), and the use of too much continuous text.

Part **(b)(ii)** was not attempted by some candidates.

Responses frequently showed that candidates had some knowledge and understanding about how parts **A** and **B** could be welded together, but in most cases did not contain sufficient detail to gain high marks. The better answers described how the edges of the metal could be cleaned, how the two parts could be held together and the actual welding process. Safety details, such as the need to wear a welding mask and leather gloves were often included. Some responses were let down by the unsatisfactory quality of the sketches (or the lack of them), and the use of too much continuous text.

In part **(b)(iii)** the majority of responses included at least some details about the making and use of a template and how the holes could be drilled. In a number of cases the various stages were stated rather than described. For example, ‘The position of the holes are marked out ‘, without going on to described **how** they would be marked out. In common with other parts of this question some responses were let down by the unsatisfactory quality of the sketches (or the lack of them), and the use of too much continuous text.

Question 3

In general this question was well answered.

The vast majority of candidates gained full marks for part **(a)**. They produced an appropriate sketch and explained that perforated meant that a series of small slits had been made in the ticket, which made it easier to tear off the bottom section.

In part **(b)(i)**, the majority of candidates correctly chose the text tool, and went on to explain how the font style, size and colour could be chosen. Many went on to explain how the text could be added in the correct position. In some cases, candidates did not make sufficient use of good quality sketches to gain high marks.

The better responses to part **(b)(ii)** described how a photograph could be imported from a digital camera, resized and correctly positioned on the design. In a number of cases, the stage of importing the photograph from a digital camera was not described. This omission could have been as a result of candidates not fully studying all of the information given in the question. In some cases, candidates did not make sufficient use of good quality sketches to gain high marks.

Responses to part **(b)(iii)** reflected the fact that the majority of candidates had good levels of knowledge and understanding about how the toolbar could be used to draw the logo and then to turn the colour to red. In some cases, candidates over complicated the required processes, by including too many stages in the drawing of the logo. In common with other parts of the question, some candidates did not make sufficient use of good quality sketches to gain high marks.

Section B

The questions in this section of the paper require candidates to analyse situations and products, identify and resolve problems and discuss issues related to the design, manufacture, use and disposals of products.

Parts **(a)**, **(b)** and **(c)** of the questions in this section of the paper were reasonably well answered by most of candidates. The number of candidates making use of the structure and mark allocation given in part **(d)** continues to increase the major weakness in some answers still relates to the insufficient levels of ‘discussion’ that takes place in candidates’ responses.

Future candidates would be well advised to base their answers to part **(d)** around the instructions and mark allocation given in the question.

In part **(d)**, 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. In some cases, candidates are doing little more than ‘stating’ the issues and the reason they are relevant.

Repetition was seen in some candidates’ answers particularly in part **(d)** of the questions where a frequent error was to give the same information using slightly different words.

Candidates could improve their performance in part **(d)** by spending a few minutes planning the contents of their response. This could, perhaps, help them avoid problems relating to repetition.

In a number of cases, candidates did not attempt to complete parts of the question that they had chosen to answer in this section of the paper.

<u>Comments on Individual Question</u>

Question 4

In part **(a)**, the vast majority of candidates correctly explained that biodegradable meant that the material from which the cup was made would break down (rot) over a period of time.

In their answers to part **(b)**, almost all candidates identified at least one of two major problems with the design of the card sleeve, and a significant number identified both. The first major problem was that the shape of the development was wrong and would not fit the shape of the cup. The second problem related to the development being too long, resulting in the sleeve sliding straight over the cup. Other more minor problems were generally given some credit if they were considered to be appropriate. It is important that problems are both identified and described.

In part **(c)**, the better responses that addressed the problem relating to the shape of the development, were those that explained that the development needed to be based on a truncated cone. A significant number of answers incorrectly suggested that the ends of the given development needed to be angled. Only a limited number of candidates produce a full solution to the problem relating to the length of the development, by explaining how an appropriate length for the development could be calculated. The majority of responses gained limited credit by simply stating that the length needed to be shorter.

In part **(d)**, candidates had to 'Discuss how and why manufacturers consider sustainability when designing new products'. While a few very good answers were seen, the general standard of responses, both in terms of the issues identified and the level of discussion that took place was very mixed. The majority of candidates were able to show at least some knowledge and understanding of the term 'sustainability'.

Examples of appropriate issues included:

- Sustainable design involves using energy and materials in a way that minimises the depletion of finite resources, waste production and pollution;
- An important economic factor for a manufacturer of sustainable products to consider is that waste is lost profit.
- Sustainability helps safeguard the world for ourselves and future generations.
- It helps to improve public image.
- Sustainable design may be the solution to built-in obsolescence and the throwaway culture
- It aims to produce products that have a low impact on climate change and the depletion of the world's resources.
- Manufacturers are increasingly using materials from renewable sources.

Question 5

The majority of candidates gained at least one mark by explaining (at least in part) that that the symbol was the 'tidy man' or 'do not litter' symbol, which aims to encourage people to dispose of unwanted packaging etc. carefully and thoughtfully.

In their answers to part **(b)**, almost all candidates identified at least one of two major problems with the design of the litter bin and a good number identified both. The first major problem related to the fact that there was no lid on the bin, which meant that litter could be blown from the bin and or be easily removed by animals and birds. The second major problem related to the fact that because plastic was a light weight material, the bin could be easily blown or knocked over. Other more minor problems were generally given some credit if they were considered to be appropriate. It is important that problems are both identified and described.

In part **(c)**, the better responses used notes and sketches to explain how the first problem could be overcome by adding (for example) an opening lid to the bin, or adding a removable top to the bin, and having openings in the side for the litter to be put through. Appropriate suggestions for overcoming the second problem included making the bin from a heavier material, or better still, securing it to the ground or a vertical surface such as a wall or fence. Some responses did not show sufficient detail about the proposed improvements to gain high marks. For example, adding a lid but not giving any details about how it would open and close.

Part **(d)** required candidates to 'Discuss how the problems associated with litter, its disposal and recycling are dealt with in public places such as parks, Schools and fast food restaurants'. The vast majority of responses showed that candidates were very familiar with problems associated with litter in public, but a significant number used the problems as the focus of their responses, rather than how these problems were dealt with. Responses that focused on just the problems gained only limited credit.

Examples of appropriate issues included:

- the provision of an adequate number of litter bins;
- providing separate litter bins for different materials in order to make recycling easier;
- regular emptying and maintenance of litter bins;
- fines for people dropping litter;
- regular clearing of litter from public places using volunteers or paid labour;
- organising regular anti-litter and recycling campaigns.

Question 6

In part **(a)** a good number of responses showed at least some knowledge and understanding about the meaning of anthropometric data. Few fully correct answers were seen that explained that it was tables of information which gave details about the average size of various parts of the body for a variety of different groups of people.

In their answers to part **(b)**, almost all candidates identified at least one of two major problems with the design of the litter push-along tractor, and a good number identified both. The first major problem related to the fact that there was nothing for a child to put their feet on, which had various safety implications. The second major problem was that the handle would be difficult and uncomfortable to use because of its angle. Other more minor problems were generally given some credit if they were considered to be appropriate. It is important that problems are both identified and described.

In part **(c)**, the better responses used notes and sketches to explain how the first problem could be overcome, by adding (for example) foot rests or pedals. Appropriate suggestions for overcoming the second problem included changing the angle of the top section of the handle and adding finger grips. Some responses did not show sufficient detail about the proposed improvements to gain high marks. For example, adding foot rests but not giving any details about how or where they would be attached.

Part **(d)** of the question required candidates to 'Discuss the ergonomic and safety factors that would need to be considered when designing a pushchair'. A good number of candidates identified at least some relevant issues which they were generally justified. Specific examples/evidence was evident (to varying degrees) in the majority of candidates work. Some responses were incorrectly focused on the design of the push-along tractor, or the specific push chair shown in Fig. 6, rather than the more general requirements of the question.

Examples of appropriate issues included:

- placing the handle at an appropriate height so that the pushchair was easy and comfortable;
- adding padding (or similar) to the interior to provide comfort and protection for the child;
- making sure that the interior was the correct size for the age range of children that the pushchair was aimed at;
- provision of a method comfortably secured the child in the pushchair;
- an effective and easy to use breaking system;
- the use of non-toxic and child friendly materials;
- provision of protection from various weather conditions.

Section C

Some reasonable design work and presentation drawings were seen in this section of the paper.

The better answers showed the use of quick free flowing sketches to produce around three distinctly different ideas for all, or part of the product that was being designed in each part of the question. While candidates should annotate their sketches, some candidates used far too much continuous text. A few candidates, unnecessarily, spent a long time producing very neat drawings of their initial ideas.

Some of the weaker responses presented only one idea or produced several drawings that gave the same information but in a different form. For example both a 2D view and 3D view showing exactly the same design idea.

The better evaluations were those that used concise notes to clearly identify the strengths and weaknesses of their designs. They included justified choices, including which design or parts of a design to carry forward to the development stage.

Candidates need to understand that ideas need to be evaluated in a meaningful way. Evaluation tables with 'star' or 'number' ratings were in evidence. While these can be used to good effect, their value lies in the use of headings appropriate to an examination situation, and an indication about what the stars or numbers mean. It must be more than 'excellent, good or poor'. Some candidates did not evaluate their ideas at all. Candidates need to be aware that there are up to 12 marks available for evaluation.

Development should be seen as more than a better re-drawing of one of the initial ideas. It should bring together, and possibly improve, the best parts of a candidate's earlier design thinking into a proposed solution. Candidates need to understand that they do not have to develop each one of their initial ideas. As part of the development process, basic details about materials, joining methods and important sizes should be given. Candidates are not required to explain stage by stage how their chosen design would be made.

Some candidates had very little or no evidence of design development and just selected one of their ideas. Some did not take sizes into account and did not give any technical detail in a visual form.

In part **(d)**, candidates were required to produce a rendered pictorial drawing of the complete product that they had designed. Candidates can produce this drawing with the aid of drawing equipment or as a high quality freehand sketch. Candidates should understand that rendering involves more than 'colouring in'. It should use colour, tonal shading and texture to enhance the three dimensional appearance of a drawing and to represent the material from which the product is made. Some inappropriate 'colouring in' was seen.

Inadequate time management was an issue for some candidates. They had spent too long on earlier parts of the question, leaving them insufficient time to complete part **(d)**.

Candidates need to understand that errors of the type mentioned above can severely restrict the number of marks available to them.

A general improvement over previous years was seen in the quality of the pictorial drawings that were produced in part **(d)**.

Comments on individual Questions

Question 7

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

The better responses to part **(a)** showed various ways in which the box could open. For example, a hinged top, a sliding top or a lift off top. Various joining methods and ways of securely keeping the box closed were also explored. A significant number of candidates focused their responses on just one aspect, how the box could be securely closed. This restricted the number of marks available to them. In a few cases, candidates incorrectly suggested alternative shapes for the box.

Part **(b)** required the candidates to consider possible layouts for the interior of the box, and the ways in which the contents could be prevented from moving when the box was carried. A crucial consideration in producing a successful interior layout was the size of each of the items the box had to contain. In a fair number of responses, there was no evidence that showed that the sizes of the items had been considered. The problem of preventing the contents from moving was frequently well addressed, with appropriate solutions such as vacuum formed inserts, partitions and the use of foam being much in evidence.

The most popular methods of carrying suggested in part **(c)** were various types of shoulder or body straps, many of which had the potential to be developed into workable solutions. The most successful designs went on to consider how the carrying method could be attached to the box, how big they needed to be and what materials they could be made from. The weaker responses did not show sufficient detail about materials, joining methods and important sizes. Some responses showed the use of various types of handles and trolleys, the majority of which would not have left both hands free.

Some very good pictorial drawings were seen in part **(d)**. The better responses clearly showed all of the features that had been designed in parts **(a)-(c)**. Some drawings did not show that the materials illustrated had a thickness. All of the materials (included fabric straps) should have been drawn (when appropriate) using a double line. The method used to join the corners of the box was frequently not shown.

Question 8

The better responses to part **(a)** explored ideas for both various types of pop-up mechanism and various ways in which features could be added to the mechanism, to make the design reflect the theme of the card. A significant number of candidates focused their work more on how the design could reflect the theme of the card, and gave little attention to the pop-up mechanism. Responses did not always give sufficient detail about materials, joining methods and important sizes.

Some good designs were seen in part **(b)**, many of which incorporated some features related to driving and the driving test into the design of the letter. For example, it was common to see an L plate used to effectively replace a conventional letter L. Many designs did not show sufficient detail about the possible use of colour, or where the lettering could be placed on the card.

Part **(c)** was frequently well answered with many candidates producing workable solutions to the problem of designing an envelope that would hold together without the use of glue or other additional material. Some responses did not include sufficient detail about sizes.

Some very good pictorial drawings were seen in part **(d)**. The type of drawing chosen by some candidates meant that the pop-up mechanism could not be seen and the illustration was only partially three dimensional. The better drawings gave a thickness for the material from which the card and envelope were made, but many responses used just a single line. A number of responses did not include the envelope.

Question 9

This was the least popular of the questions in this section of the paper, and was answered by only a very limited number of candidates.

The most effective solutions to part **(a)** of the question used a sliding mechanism that could be pushed from side to side. Some solutions were over complex. Most responses did not show sufficient detail about materials, joining methods and important sizes.

In part **(b)**, the better solutions showed both a suitable shape for the top section and how the mechanisms could fit into it. Some solutions were over complex. Most responses did not show sufficient details about materials, joining methods and important sizes. It was not always clear how the mechanisms would be housed.

While the responses to part **(c)** showed some sort of pole and base, it was not always clear how the various parts would join together so that they could be easily disassembled for storage purposes. Some of the bases that were designed would not have been stable. In common with other parts of the question, there was frequently a lack of detail about materials and sizes.

In part **(d)**, the type of drawing chosen by some candidates did not allow all of the features that had been designed in **(a)-(c)** to be fully shown. This particularly applied to the mechanism and the way in which the pole was attached to the top section and the base. The drawings could have been improved by making use of cut away sections, and exploding some of the parts. In general, the drawings produced were not of a very high standard.

DESIGN AND TECHNOLOGY

Paper 9705/02

Project 1

Key messages

- Successful candidates focus on the design need and brief throughout the analysis and research stages of their project, rather than on any preconceived idea of an outcome.
- Design folders that are presented neatly and in the order of the assessment criteria, make it easier for the reader to follow the design thinking that has taken place. It also helps the candidate to check that no stage is missing.

General comments

Candidates clearly became very involved in their Design and Technology project work, identifying design problems that were close to their own needs, and producing outcomes that were of use to themselves or others. There are certain advantages to this approach, as the whole design process then becomes more meaningful to the candidate concerned. Another successful approach was for candidates to identify a design need or situation when focusing on a theme, such as community issues or entertainment.

As is the case every year, many interesting topics were considered. Outcomes of either models or final products included candidate locker system, car wheel changing aid, portable study table, surfboard rack, van storage system, rope storage reel, fertiliser spreader, camera support, model footbridge, ore crusher, crash helmet carrying box; garden shelter; sun lounger; chicken coop; crop storage; water carrier; crop drier; fruit picker, farm food mixer, cable and wire storage, recycling bin, food slicer, public seating, litter picking device, bird feeder, camping storage system, mobile phone packaging, shower chair, potato harvester, house lighting, hanging chair, skateboard deck, CD packaging, stage set, cycle maintenance stand, mini whiteboard, gate locking system, grain sieve, baby's cot, small crane, animal auto feeders, light bulb replacer and garden mulch producer.

Many design situations resulted in the production of architectural models, which were produced to very high standards, and represented a realistic view of the proposed buildings.

The Moderator would like to thank the majority of Centres for presenting work for moderation clearly labelled, and with all documentation complete. It is helpful when the photographic evidence of realised outcomes is included at the appropriate stage of the design folder, the end of Project 1 for the model, and at the end of Project 2 for the final product.

Comments on Individual Assessment Criteria

Project 1 - 9705/02

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 nature of the design situation as soon as possible. This introductory section of the folder identifies the precise 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.

Specifications were generally well written, and many candidates realised 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, it is easy to see how a candidate's thought process has developed.

It is important that different ideas are annotated with comments linked to the design specification, so that all important aspects of the need are considered. Successful candidates recorded all ideas that came to them, however practical or appropriate they appeared at the time. These were then appraised in an ongoing fashion so that other ideas could 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, for example, 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.

DESIGN AND TECHNOLOGY

Paper 9705/31

Written 2

General comments

The majority of candidates used the time available effectively and made full attempts at all sections of the paper this year. There were very few candidates who answered more than the required number of questions for ***Section A*** but an increasing number of candidates only attempted one question. A very small number of candidates attempted ***Section B*** only.

It is very important that candidates are made fully aware of the format and requirements of the paper and that their chances of achieving as high a mark as possible can be severely compromised if they do not comply with the rubric.

Some candidates spend too much of their allocated time on ***Section B*** at the expense of lack of detail in their responses in ***Section A***.

Most candidates made very good use of appropriate sketching and annotation in ***Section A*** and the presentation of work for ***Section A*** was generally of a good standard. Candidates used appropriate sketches to describe the stages of particular processes and support their answers to questions in ***Section A***.

Candidates need to be made aware of the instructions given on the front page of the examination paper. A number of questions have the instruction 'discuss'; candidates should:

> *examine critically the issues raised by the question;*
>
> *explain and interpret these issues as appropriate;*
>
> *introduce evidence wherever possible to support conclusions of arguments.*

Candidates generally performed very well in ***Section B***. Some candidates unnecessarily copied out the question or reworded the situation, which wasted valuable time.

It is important that candidates have experience of completing tasks similar to those found in this examination under timed conditions.

In ***Section A***, Part **A** was the most popular.

In Part **A**, **Question 1** and **2** were equally the most popular. A few candidates attempted **question 3**. Very few candidates attempted questions in Part **B**. **Question 4** was the most popular followed by **Question 6**. **Questions 8** and **9** were the most popular in Part **C**.

In ***Section B***, **Question 10** and **12** were the most popular.

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

Comments on specific questions

Section A

Part A – Product Design

Question 1

This question was generally well answered. A few candidates spent a disproportionate amount of time on this question, in some cases using more than 6 sides of A4 paper. Whilst there were a number of excellent and full responses, a significant number lacked the appropriate detail to access the higher marks.

The most popular processes chosen were welding and jointing.

(a) The best responses used appropriate sketches to describe the key aspects of the process chosen. Welding was particularly well described. A number of candidates selected an appropriate jointing method but did not describe in detail the key stages of the process.

(b) Most candidates were able to give reasons why the process they had chosen was suitable for the item; strong joint and quick process for welding, attractive features of wood enhanced and structural strength and effective gluing area for jointing. Candidates commented on the ability to create strong and durable compound shapes in GRP. A number of candidates did not attempt part **(b)**.

To achieve full marks, candidates are expected to show that they can clearly identify the specific suitability of the process for the given product.

Question 2

This was a very popular question with some very full and detailed responses.

(a) Most candidates selected appropriate materials for the frame. Aluminium, Mild Steel and Brass were the most common responses. Rigidity and ability to shape to a high standard of accuracy were the most popular correct reasons given.

(b) This part of the question was answered very well. The majority of candidates correctly described the key stages of marking out, shaping and finishing the frame. A number included quality control checks for this accurately engineered item. A number of candidates did not describe how the M6 thread would be produced.

A key part of the question is the instruction '.. how **you** would make the frame…' meaning how the candidate would make the frame. Some candidates described inappropriate processes such as injection moulding and vacuum forming.

(c) Some candidates correctly described in detail the use of templates and jigs to manufacture the frames.

Many candidates demonstrated a very good knowledge of casting technologies and described appropriate methods to manufacture 1000 frames. Only a few candidates made reference to the M6 thread.

Question 3

There were some outstanding responses to this question. Many candidates were fully aware of anthropometric considerations and gave several ways in which designers took this into account when designing, including the use of different sizes; as in clothing and footwear and the use of adjustability, as in car seats and watch straps.

Some candidates made excellent use of annotated sketches to support their answer.

Part B - Practical Technology

Question 4

Relatively few candidates attempted this question. Most of the responses were detailed and candidates demonstrated a good knowledge and understanding of the impact of computers on designing and making. A number of candidates referred to only one application for part **(a)** and one application for part **(b)**.

(a) Computer Aided Design and the Internet were the two most popular correct responses. Candidates referred to the speed, quality and accuracy of CAD and the ability to made quick and rapid changes. Designs can then be easily accessed anywhere in the world. The use of the Internet for research of existing projects or specific data was a popular correct response.

(b) Candidates correctly described the use of computer controlled machinery such as laser cutters, routers, millers and lathes. A few candidates correctly referred to how computers control stock in Just in Time production systems.

Question 5

There were very few attempts at this question.

(a) Almost all responses were well detailed with candidates naming and describing the function of the given components.

(b) Only a few candidates were able to produce sketches/circuit diagrams showing an appropriate application of the component.

Question 6

There were few attempts to this question. The responses were very good.

(a) All candidates described what was happening to the materials **X**, **Y** and **Z** in the graph. Many stated a material that would exhibit such properties.

(b) Almost all candidates correctly described a method of testing impact.

(c) Some candidates had a clear understanding of non-destructive testing and explained its importance in terms of safety and economy. X-ray testing was the most popular method described. A number of candidates did not attempt this part.

Part C – Graphic Products

Question 7

Most candidates raised several pertinent issues relating to packaging. The best responses focused on the protection and advertisement of the product. Many candidates included interesting and valid comment on environmental and economic issues relating to packaging.

Whilst there were a number of full and well-written discussions, a significant number of candidates produced very brief responses, which did not have enough detail or quality to achieve the middle or higher mark ranges.

It is important that candidates use specific examples to support their answers in discussion questions.

Question 8

There were some excellent, full and accurate responses to this question.

(a) Most candidates produced a correct sectional elevation with all components assembled.

Not all candidates completed a plan in projection.

(b) Almost all candidates were able to give two appropriate methods of improving the grip on the handle. Reshaping the handle and knurling were the most popular correct responses.

Question 9

There were very few responses to this question. Most candidates were not able to use correct construction to draw the plan view for part **(a)** or create the true shape of the lid for part **(b).**

Part **(c)** was generally answered well with most candidates using good sketches to describe effective methods of connecting the top to the base. Very few candidates produced feasible methods of attaching the lid to the top.

Section B

All candidates prepared their answers on the A3 papers as instructed. The general standard of response to this Section was good.

Whilst most candidates completed their responses in the time allocated, there was an increasing number of candidates who did not fully complete the last sections of development, final proposal and evaluation.

Some candidates copied out the question or rewrote the question as part of their analysis; this was unnecessary and wastes valuable time.

There were a number of outstanding responses with candidates exploring innovative and creative solutions.

Presentation skills were generally impressive with the majority of candidates showing good knowledge of appropriate materials and construction techniques.

The best responses for the analysis and specification section were where candidates generated a scatter-chart or list, focusing on the specific requirements of the given problem. A significant number of candidates achieved little credit by producing a generic scatter chart, which bore very little relevance to the question. The analysis should then lead to justified and appropriate specification points. Single word or generic statements, with no reference to the product will not gain a mark.

The quality of the presentation and range of design possibilities continues to improve. The majority of candidates produced a range of at least three different design ideas with many including the exploration of sub-problems. There were a number of candidates who focused on one concept and consequently did not access the middle and higher mark ranges.

Evaluation is becoming more evident from many candidates in the exploration of ideas section; this is to be encouraged.

A number of candidates employed a tick list to evaluate their ideas and identify a chosen solution. These are not always appropriate unless they are appropriately qualified. The higher marks are achieved when candidates give evaluative comments based on their ideas and can make a reasoned judgement on the best solution or features to take forward for further development. Candidates must make clear the reasons behind their selection.

Many candidates developed a selected idea from the exploration stage and justified the materials and constructional methods in the development section. Candidates are advised to avoid superficial development of features such as ‘round off corners’; and focus on modifications and specific details of materials and construction to achieve the higher mark range.

Most proposed solutions were feasible and well presented.

Most candidates included overall dimensions in their final proposal; for full marks in the detail section, candidates would be expected to include dimensions, materials and possible finishes.

Some candidates produced valid evaluations of their proposal; describing the positive features and functional details of their proposal and suggesting further modifications or improvements. A number of candidates copied out their specification points and place a tick to show whether the point has been satisfied or not. This will not access the full mark range.

Question 10

There were some very creative and innovative responses to this question. The presentation of work was generally of a very good standard.

Acceptable specification points included:

– the product must be robust and strong enough to be able to crack the toughest nuts;
– the product must have significant mechanical advantage for a 14 year old to operate effectively;
– the product must have a method of protecting the user from shells breaking and pieces flying off;
– the product must of attractive appearance to suit a dining table environment;
– the product must be able to store a variety of nuts and provide easy access for the user to select them.

Most candidates produced a wide range of possible solutions, selecting and justifying appropriate materials. Levers and screw threads were the most common cracking mechanisms.

Material and constructional detail was generally detailed and appropriate.

Final proposals were suitable and detailed. The best responses included full dimensions and details of appropriate finish. Evaluations were generally weak; few candidates made specific reference to the final proposal and suggested possible improvements.

Question 11

Relatively few candidates attempted this question. The question required the candidate to 'design a soldering unit to enable accurate soldering of components onto printed circuit boards'. Some candidates wrongly interpreted the instruction and designed a storage device therefore access to the full range of marks was limited. Most produced feasible units that fulfilled all requirements.

Acceptable specification points included:

– the unit must be stable to ensure safe usage by candidates;
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Some solutions were too large and ignored the requirement to hold the PCB at a range of heights and angles.

The most successful ideas were compact, desktop units with a secure holder for the soldering iron and an easy method of holding and adjusting the PCB.

Question 12

This was a popular question with a number of well-presented responses. Most candidates explored a range of basic proposals for the packaging. The question required candidates to 'design a **new** innovative package'. Too many candidates produced similar ideas to the packaging that was to be replaced and did not consider the shape of the chocolates. The best responses recognized the particular geometric shape and considered the quantity; packaging 36 chocolates.

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

Acceptable specification points included:

– the packaging must allow easy access to the chocolate pieces;
– the packaging must include all of the relevant labelling, sell by dates etc.;
– the packaging must be easy to open and securely close;
– the packaging should be recyclable or be able to be re-used to prevent wastage of valuable resources;
– the packaging should be designed so that it can be produced in medium to large batches.

The best responses considered the specific shape of the chocolate. They included details of a range of appropriate specific graphic materials, net designs and printing methods.

A few candidates designed packaging from resistant materials. Methods described and materials selected would have been unsuitable for anything but one-off or very low quantity batch production.

Most candidates produced very creative names for the new product and included exciting graphics to create interest.

A number of candidates did not include full details of the packaging in their final proposal. An outline drawing of closed packaging could only access the lower mark ranges.

DESIGN AND TECHNOLOGY

Paper 9705/32

Written 2

General comments

The majority of candidates used the time available effectively and made full attempts at all sections of the paper this year. There were very few candidates who answered more than the required number of questions for ***Section A*** but an increasing number of candidates only attempted one question. A very small number of candidates attempted ***Section B*** only.

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In ***Section A***, Part **A** was the most popular.

In Part **A**, **Question 1** and **2** were equally the most popular. A few candidates attempted **question 3**. Very few candidates attempted questions in Part **B**. **Question 4** was the most popular followed by **Question 6**. **Questions 8** and **9** were the most popular in Part **C**.

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

<u>Comments on specific questions</u>

Section A

Part A – Product Design

Question 1

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Some candidates made excellent use of annotated sketches to support their answer.

Part B - Practical Technology

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Part C – Graphic Products

Question 7

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Whilst there were a number of full and well-written discussions, a significant number of candidates produced very brief responses, which did not have enough detail or quality to achieve the middle or higher mark ranges.

It is important that candidates use specific examples to support their answers in discussion questions.

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Part **(c)** was generally answered well with most candidates using good sketches to describe effective methods of connecting the top to the base. Very few candidates produced feasible methods of attaching the lid to the top.

Section B

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Material and constructional detail was generally detailed and appropriate.

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Question 12

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A number of candidates did not include full details of the packaging in their final proposal. An outline drawing of closed packaging could only access the lower mark ranges.

DESIGN AND TECHNOLOGY

Paper 9705/33

Written 2

General comments

Candidates were well prepared for this examination and there were very few rubric errors. Most candidates used their time effectively in both sections of the paper. Some candidates answered ***Section A*** only.

The overall standard of candidate performance continues to improve. There were a number of outstanding scripts presented this session.

The quality and use of appropriate sketching and annotation was of a particularly good standard throughout the paper.

Candidates are well prepared for ***Section B*** with most candidates fully completing all of the requirements. There was an increase in the number of candidates who did not fully complete the development section and a few who made no attempt at the final proposal and evaluation

In ***Section A***, Part **A** was the most popular with a number of candidates attempting Part **C**. Very few candidates made attempts at questions in Part **B.**

In Part **A**, **Question 1** and **Question 2** were the most popular questions.

Questions 7 and **8** were the most popular in Part **C**.

In ***Section B***, **Question 10** and **Question 12** were the most popular. A few candidates attempted **Question 11**.

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

Comments on specific questions

Section A

Part A – Product Design

Question 1

This was a popular question with a wide range of responses. The majority of candidates made good attempts at describing the injection moulding process. There were an equal number of attempts at the turning of the wooden bowl and the casting of the bearing housing.

The highest marks were awarded to candidates who produced fully detailed descriptions of the manufacturing process chosen, using clear sketching and annotation, of the two or three key stages.

(a) Candidates who chose to describe the injection moulding of the chess piece generally gave fully detailed descriptions. Whilst the process was generally well described, some candidates did not consider the key features of the mould.

Most candidates correctly described a process of casting the bearing housing. Sand casting was generally fully described with candidates giving full details of the pattern and preparation of the mould. A number of candidates described different die casting methods; most were fully detailed but some candidates did not include the preparation of and particular features of the die.

There was a range of responses to the process of turning the wooden bowl. Some candidates produced excellent, fully detailed answers but a significant number had very little knowledge of lathe use.

(b) Most candidates were able to correctly explain why the relevant process was suitable for the production of the items. The cylindrical shape and high quality finish for turning, the ability to produce large numbers of high quality, identical chess pieces for injection moulding and the minimal wastage and relatively low cost production method of sand casting.

Question 2

(a) The majority of candidates gave appropriate materials and reasons for suitability.

MDF, acrylic, a specific hard/softwood and card were the most popular correct responses.

(b) Most candidates identified a specific wood-based material (mostly pine with plywood base) and described a range jointing and assembly methods. Most correctly used rebate joints or comb joints for the corners of the unit with a housing joint for the centre partition. A significant number of candidates made little or no reference to the base and consequently did not access the full mark range.

The bending and joining of plastic materials was generally well described. Some candidates described excellent net designs in card and produced effective folded card methods of creating the Centre partition.

The use of annotated sketching was generally very good on this question.

(c) Most candidates identified injection moulding as the process to create 5000 units and changed the materials required. Many did not achieve the higher mark range, as they did not consider the changes in design of the unit or give specific details of the mould required.

Question 3

There were a number of outstanding answers to this question. The best responses explained issues relating to environmental considerations, the selection of appropriate materials and vandalism or theft. Most candidates include appropriate supporting evidence and examples to support their answer.

Some responses were very brief and did not contain enough detail or quality to access the middle to high mark range.

Part B - Practical Technology

Question 4

There were very few attempts at this question. Some responses were outstanding; fully detailed and well explained.

(a) Almost all candidates named an appropriate specific product.

(b) Most candidates were able to fully explain the properties of the material that made it suitable for the particular application.

Question 5

There were very few attempts at this question.

(a) (i) Most candidates correctly stated clockwise rotation.

(ii) Most candidates correctly calculated the gear ratio as 12:1

(b) Some candidates produced detailed descriptions of oil or grease-based lubricating systems. Some candidates referred to only one method and did not access the full mark range.

(c) Most candidates identified the disadvantages of friction in relation to wear and heat. Some candidates were able to explain the advantages of friction by using examples of brakes and tyres.

Question 6

There were very few attempts at this question.

Some candidates had a good knowledge and understanding of the use of reinforcement methods in structures; triangulation and ribs were particularly well explained. Candidates were able to identify at least one specific structure and show how it could be reinforced.

Part C – Graphic Products

Question 7

There were some very full and detailed responses to this question.

Most candidates raised issues such as the aesthetic importance of shape, colour and texture in attracting attention to products. Many included specific examples of products to highlight how visual impact is affected by fashion and trends.

Most responses were generally well structured and candidates followed the instructions on how to respond to a ‘discuss’ question.

Question 8

No candidates chose to answer this question.

Question 9

There were some outstanding responses to this question.

Candidates generally had a good grasp of the use of one-point perspective and produced accurate and fully detailed views of the study area.

The best responses were well presented and had each feature of the study area accurately positioned. Some candidates answered this question on lined paper in their answer booklet; this is to be discouraged; the inclusion of the 1 m grid on the question requires candidates to carefully plan and layout their work.

Section B

There were a number of outstanding responses to this section of the paper. Presentation skills were generally of a very good standard and candidates demonstrated their knowledge of appropriate materials and construction techniques. Some very innovative and creative work was presented.

All candidates prepared their answers on the A3 papers as instructed.

Whilst most candidates complete their responses in the time allocated, there were a number of candidates who did not fully complete the last sections of development, final proposal and evaluation.

The best responses for the analysis and specification section were seen where candidates generated a scatter-chart or list; focusing on the specific requirements of the given problem. A significant number of candidates achieved little credit by producing a generic scatter chart, which bore very little relevance to the question.

The analysis should then lead to justified and appropriate specification points. Single word or generic statements, with no reference to the product will not gain a mark.

The exploration of ideas was generally very good. The majority of candidates produce a range of at least three different design ideas, many including the exploration of sub-problems.

Reference to appropriate specific materials was also generally very good; most candidates gave appropriate justifications for their use.

Most candidates produced an on-going evaluation of design ideas this year. Some candidates, however, did not give reasons for the selection of an idea/s for further development. It is important that candidates consider all points of specification when designing.

The higher marks are achieved when candidates give evaluative comments on their ideas and can make a reasoned judgment on the best solution or features to take forward.

Many candidates developed a selected idea from the exploration stage and justified the materials and constructional methods in the development section. Candidates are advised to avoid superficial development of features such as ‘round off corners’ and focus on modifications and specific details of materials and construction to achieve the higher mark range.

Most proposed solutions were feasible and well presented; some were exceptional ideas with potential commercial possibility. Most included overall dimensions, to achieve the top range of marks candidates need to give more detailed dimensions such as the section or thickness of materials used. For full marks in the detail section, candidates would be expected to include dimensions, materials and possible 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 a popular question, generally well answered. Some responses were exceptionally creative.

Acceptable specification points included:

- the device must be quick to identify height so as not to cause queuing;
- the device must be constructed from weather resistant materials or materials that are suitably finished for outdoor use;
- the device must have a clear visual indication of the height limit for a particular ride;
- the device must be easily and quickly adjusted to the height limit required;
- the device must not have a resistant ‘barrier’ which may harm or injure the customer.

Most candidates generated a good range of ideas, some presented exciting, new and innovative solutions. Many responses had excellent, flowing design thinking, candidates were considering a range of possibilities for each of the specification points.

Final proposals were generally realistic with most including details of materials or important dimensions. Although some evaluations were detailed and focused on the product, a number of candidates copy out their specification points and place a tick to show whether the point has been satisfied or not. To access the higher mark range, candidates must describe the positive features and functional details of their proposal and suggest further modifications or improvements.

Question 11

There were a few attempts at this question. Most candidates produced ideas based on the propeller propulsion of a boat shape. Candidates generally had a good understanding of the technical requirements of creating a device to function in water.

- the device must be completely waterproof to protect the components;
- the device must have a streamlined shape to cut effectively through water;
- the device must have a mechanism/rudder to ensure straight travel;
- the device must have a propulsion system (propeller or wheel) that will give maximum efficiency;
- the device must have all components secured so as to prevent wobble or rocking motion that could deflect or slow it down.

Question 12

There was a good range of responses to this question. Most candidates produced effective and workable solutions, considering all of the requirements. Some candidates misinterpreted the question and designed the leaflet.

Whilst most candidates fully complied with the requirements, some ignored the request for the unit to hold leaflets for up to 10 different places to visit.

Acceptable specification points included:

– the unit must be positioned so that leaflets can be easily accessed;
– the unit must be stable and not collapse when impacted;
– the unit must be designed from material suitable for indoor and outdoor use;
– the unit should have clear graphics and text to attract/inform the customer;

Most candidates produced effective units and considered the size of the leaflet and the anthropometric data required for the positioning of the methods of holding the leaflets. Very few candidates explored exciting and innovative solutions.

A range of materials was proposed and appropriate construction methods employed to allow easy assembly and disassembly.

DESIGN AND TECHNOLOGY

Paper 9705/04

Project 2

Key messages

- Successful candidates focus on the design need and brief throughout the analysis and research stages of their project rather than on any preconceived idea of an outcome.
- Design folders that are presented neatly and in the order of the assessment criteria make it easier for the reader to follow the design thinking that has taken place. It also helps the candidate to check that no stage is missing.

General comments

Candidates clearly became very involved in their Design and Technology project work, identifying design problems that were close to their own needs and producing outcomes that were of use to themselves or others. There are certain advantages to this approach as the whole design process then becomes more meaningful to the candidate concerned. Another successful approach was to focus on a theme, such as community issues or entertainment, with candidates then being required to identify a design need or situation within this.

As is the case every year, many interesting topics were considered and outcomes of either models or final products included: candidate locker system; car wheel changing aid; portable study table; surfboard rack; van storage system; rope storage reel; fertiliser spreader; camera support; model footbridge; ore crusher; crash helmet carrying box; garden shelter; sun lounger; chicken coop; crop storage; water carrier; crop drier; fruit picker; farm food mixer; cable and wire storage; recycling bin; food slicer; public seating; litter picking device; bird feeder; camping storage system; mobile phone packaging; shower chair; potato harvester; house lighting; hanging chair; skateboard deck; CD packaging; stage set; cycle maintenance stand; mini whiteboard; gate locking system; grain sieve; baby's cot; small crane; animal auto feeders; light bulb replacer and garden mulch producer.

Many design situations resultant in the production of architectural models which were produced to very high standards and represented the proposed buildings realistically.

The Moderator would like to thank the majority of Centres for presenting work for moderation clearly labelled and with all documentation complete. It is helpful when the photographic evidence of realised outcomes is included at the appropriate stage of the design folder, at the end of Project 1 for the model and at the end of Project 2 for the final product.

Comments on Individual Assessment Criteria

Project 2 – 9705/04

5. Product Development

Successful 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. This usually included details of all materials, form and constructions, as required by the nature of the chosen design. Unfortunately, there was sometimes little evidence to indicate why these materials and methods had been chosen, and how others were considered before making the final choice.

Candidates who had been awarded high marks also showed how they had carried out some form of trialling or testing on some of these aspects. For example, these successful candidates showed how they had tested materials or trialled alternative constructions before finalising their choices.

6. Product Planning

The majority of candidates fulfilled successfully this requirement of their design work, 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, graphics or other media. 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.

It was helpful where candidates had included not only detailed and clear photographic evidence of the final realisation, as required by the syllabus, but also of the product in use.

8. Testing and Evaluation

There has been continuing improvement in this section of design folders as more candidates show evidence of carrying out meaningful testing and evaluation. This can only be completed successfully, if the results of the testing are then compared to the original design specification.

There is obviously a temptation for some 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 simplistic 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.