DESIGN AND TECHNOLOGY

Paper 9705/11
Written 1

General Comments

In general, the performance of candidates showed an improvement on 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 how many marks were 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 an incomplete 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 that their responses 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 candidates, 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 wording.

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.

Comments on Specific Questions.

Question 1

Part **(a)** of this question was generally very well answered. The majority of candidates produced an annotated sketch that clearly showed that plywood was made from an odd number of layers of veneer with the grain of one layer running at right angles to the next.

In part **(b)(i)**, very few candidates knew what a jig was. Most responses shown either some form of template being used to mark out the dividers or described how one of the dividers could be cut to length.

The better answers showed a jig in which the work could be held firmly and then cut to the required length without the need for marking out.

Most candidates gained at least half credit for their answers to part **(b)(ii)** by describing, with varying degrees of success, how tools such as saws, chisels and routers could be safely used to make the joint. Some of the weaker responses suggested that the whole joint could be cut out using a chisel and mallet.

The vast majority of candidates were able to describe at least some of the stages involved in applying a painted finish to the CD rack. The better answers described how the rack would need to be prepared for painting, how sealer and/or undercoat could be applied by brush or spray, how the rack would then need to dry and be rubbed down before further coats were applied. Safety precautions such as working in a well ventilated area and wearing protective clothing were frequently identified.

Question 2

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

Very few correct answers were seen to part **(a)**, with most candidates incorrectly suggesting that paint would be a suitable finish.

Correct answers included varnishing or laminating. Appropriate reasons for using a finish included the fact that it strengthened the card or it gave it a glossy finish.

In part **(b)**, most candidates sketched some form of slot and tab many of which had the potential to work. Fewer or the responses went on to describe how the slot and tab could be cut out and used to hold the base securely in a closed position.

The majority of developments (nets) that were sketched in part **(c)** were produced to an appropriate scale and showed four sides and a base. Fewer of the answers included all of the additional features required to make the money box. These additional features were the money slot, the glue tab and the slot and tab fixing.

A few very good answers were seen to part **(d)**, but the vast majority of responses showed an incomplete knowledge and understanding of the die cutting process. Where a response had been produced, it usually described how a craft knife could be used to cut out the money slot rather than a die cutter.

Question 3

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

The vast majority of candidates answered part **(a)** very well and gained all of the available credit. Acrylic was the material that most candidates suggested as being suitable for making part **A**. Other appropriate materials included polystyrene, aluminium and stainless steel. Suitable reasons for choice included that the material was waterproof, it required no surface finish and, particularly in the case of acrylic, was easy to bend.

In part **(b)(i)**, the better answers frequently came from the candidates who had chosen to use acrylic for making part **A**. Most of these responses described, with varying degrees of success, how the acrylic could be heated and bent to the required shape using formers. The better responses described how the acrylic could be heated in an oven while others suggested the use of a strip heater. This would have been a less appropriate method in this situation. The responses from candidates who had chosen to use materials other than plastic frequently lacked the level of detail required to gain high credit.

Some very good answers were seen to part **(b)(ii)**. Most candidates gained over half marks by describing how tools and equipment such as saws, rasps, files, sanding discs and abrasive paper could be used to cut out part **B** and smooth the edges of the plywood. Most went on to describe how the holes could be drilled with the better responses making use of a hole saw to produce the larger hole. Almost all responses included at least some safety precautions such as the need to secure the work firmly when drilling, etc. and to wear appropriate safety equipment.

The better answers to part **(b)(iii)** were those that identified screws as being the most suitable way of fixing parts **C** and **D** together. These answers then went on to describe, stage by stage, how this fixing method could be achieved. Stages needed to include drilling and countersinking holes and the use of a screwdriver to put the screws in. A fair number of over complex and inappropriate fixing methods were seen many of which would not have securely joined the two parts together. Solutions that would have partially have worked, such as hinges, were given some credit.

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 more candidates made use of the structure and mark allocation given in part **(d)** than in previous years the major weakness in many answers continues to relate to the levels of 'discussion' that takes place in candidates' responses.

Future candidates are 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 wording.

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 Specific Questions

Question 4

Part **(a)** was reasonably well answered with the majority of candidates gaining at least partial credit. Many understood that the feature was related to fixing the cardboard tray together but fewer explained the function of the feature in sufficient detail to gain full credit. Answers needed to clearly explain how the tab went into the slot and 'locked' the parts of the box together. In a few cases candidates did not use a sketch as part of their answer.

In part **(b)**, a good number of candidates correctly described at least one problem with the design of the tray. Problems needed to relate to the fact that it would be difficult to get forms out of the tray and not being able to see the lettering when the tray was full of forms.

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 removing part of the front of the tray and making the back of the tray higher so that the lettering could be moved up or putting the lettering somewhere else on the tray. A number of good answers were seen.

The majority of candidates identified some appropriate issues in part **(d)** and a good number explained, with varying degrees of success, why they were important. Fewer went on to offer any specific evidence to support any conclusions they had made.

Question 5

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

Part **(a)** was well answered by the vast majority of candidates. Most gained full credit by explaining that the feature was a slot or handle that enabled the user to lift the chair easily.

In part **(b)**, perhaps as a result of not reading the question carefully enough, a number of candidates did not identify problems with design **A** that made it unsuitable for use as a stacking chair. Problems needed to relate to it not being possible to stack the chair because of the cross rail and because the frame was wider than the seat. The problem most commonly identified problem was the one related to the position of the cross rail.

The better answers to part **(c)** use notes and sketches to good effect to explain how the design would need to be changed in order for it to function as a stacking chair. Appropriate changes were to remove or re-position the cross rail and to alter the design of the seat and/or frame so that one chair could stack on top of another. A good number of the changes that were suggested were not related specifically to a stacking chair.

Candidates could have improved their performance in parts **(b)** and **(c)** by analysing the information given in the question more carefully.

Part **(d)** was generally answered well. A good number of answers were based around the identification of appropriate issues the choice of which candidates went on to justify. A reasonable number of responses included the use of specific examples/evidences to support the conclusions that had been made by the candidate.

Question 6

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

Part **(a)** was generally well answered with the vast majority of candidates explaining that the symbol meant that a substance or material was inflammable and could easily catch fire.

In part **(b)**, the problems identified by some candidates too general and did not apply specifically to a safety poster. Appropriate problems needed to relate to safety issues such as the person was not wearing a mask and was not working in a well ventilated area (the window was closed).

In part **(c)**, when appropriate problems were identified, this part of the question was frequently answered well. Candidates produced drawings showing the person wearing a mask and the window open. Some showed a spray booth and extraction system being used.

Candidates could have improved their performance in parts **(b)** and **(c)** by analysing the information given in the question more carefully.

Part **(d)** required candidate to discuss the functional and aesthetic effects of applying a surface finish or treatment to a product. Very few good answers were seen to this part of the question.

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 a 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. 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. Credit cannot be awarded for design development where a candidate has simply chosen one of their ideas and redrawn it.

A good number of excellent rendered pictorial drawings were seen in part **(d)**. However in some responses the rendering was not attempted or was poorly done. 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 Specific Questions

Question 7

In general, this question was well answered with reasonable responses being seen to most parts of the question. The quality of both the sketching and written communication produced by the majority of candidates was of a good standard.

In part **(a)** of the question, the majority of candidates produced appropriate designs for the plastic insert. Most considered, with varying degrees of success, how their designs could prevent the model car from moving in the box. A requirement of the question was that the insert should be made from plastic. Perhaps as a result of not reading the question carefully enough some candidates suggested the use of other material, such as card, to make the insert. The better designs were generally those that used some for of indents in the insert for the wheels of the car to fit in. A number of over complex designs were seen.

Part **(b)** was reasonably well answered. The majority of candidates produced designs that addressed the requirements of the question. A few candidates produced designs that were made from more than one piece of card, for example, a card tray which slid into an outer sleeve. The better solutions were those that showed the shape of the box, how the box would open and close, the window and, most importantly, the development (net) required to make the box. A fair number of candidates only looked at the shape of the box.

The quality of the answers to part **(c)** was very mixed. While a good number of responses made some attempt to show lettering that reflected the name of the car, the quality of the design work was frequently not

very good. The better responses were generally those that formed the lettering into an elliptical shape or placed the lettering in an ellipse. These responses frequently went on to consider colour and where the design would be placed on the box.

In part **(d)**, the majority of candidates produced a pictorial view and made at least some attempt to use colour. The better responses were those that showed an open box with the insert partly pulled out of the box. However, most responses showed the box closed which made it almost impossible to show any details about the insert. The letter was generally poorly drawn and often produced in 2D rather than pictorial form. Some responses made good use of tonal shading but a good number of multi coloured drawings was seen. A number of incomplete drawings were seen.

Question 8

This proved to be by far 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 and frequently very good standard respectively.

In part **(a)** of the question, the majority of candidates produced appropriate designs that would have allowed up to 20 coats to be hung on the trolley. The better designs were generally those that used some form of rail system which was joined to the bottom of the trolley by one or more supports. A number of over complex, and sometimes unsafe, designs were seen. A good number of responses had not taken the size of the end user into account and produced designs that would have been difficult for young children to use.

Almost all of the responses to part **(b)** allowed for at least 20 pairs of shoes to be stored on the trolley; but frequently it was not the required number of up to 20 pairs.

The better answers were generally those that used some form of simple shelving divided up to provide the required number of spaces. A number of over complex, and sometimes inappropriate, designs were seen. Many of these designs would have been difficult to use. A good number of responses had not taken into account the design of the hanging system produced in part **(a)** and produced ideas for shoe storage systems that would have made it difficult to use and/or attach the hanging system.

A fair number of potentially workable handle designs were seen in part **(c)**. The better designs were those that had considered comfort, ease of use, safety and how the handle could be easily fixed to and removed from the trolley. As with other parts of the question, some over complex designs were seen.

A good number of excellent rendered drawings were seen in part **(d)**. However, in some responses, the rendering was not attempted or was poorly done. A few 2D drawings were produced which could only gain very limited credit.

Question 9

This was the least popular of the questions in this section of the paper. The quality of both the sketching and written communication produced by the majority of candidates was of a good standard.

In part **(a)**, the better responses showed designs for both the shelf and the system that would both support the shelf and allow it to be pulled out and pushed back under the desk. The weaker designs generally focused on just the shape of the shelf. A good number of answers did not include any details about how the pull out shelf would be attached to the frame.

The better responses to part **(b)** were those that included designs that showed the shape and size of the folding flap, how it would be attached to the frame so that it could fold down and how it could be supported in a horizontal position. Only a limited number of responses included all of these features. Some responses failed to take into account the design of the pull out shelf that had been produced in part **(a)**. This frequently resulted in flaps that would not fully function or would prevent the shelf being pulled out.

In general, part **(c)** of the question was poorly answered. Many responses failed to take into account the size of the shelf unit and/or the fact that the shelves had to be adjustable. The better responses were those that designed a rectangular shelf unit that was 500 wide, 150 deep and 750 high and used a simple method to make it possible to adjust the shelves inside the unit. The most successful of the methods seen used pegs or dowels that fitted into holes in the sides of the unit. The shelves rested on the pegs or dowels and could be adjusted by changing the positions of the pegs or dowels.

The quality of the drawings produced in part **(d)** was very mixed. While a number of high quality rendered drawings were seen, some responses did not include all of the features that had been designed in parts **(a)-(c)**. The better responses showed the shelf pulled out as well as its supporting system, the folding flap along with the methods of attaching it to the frame and holding it in a horizontal position and the adjustable shelving unit.

DESIGN AND TECHNOLOGY

Paper 9705/12
Written 1

General Comments

In general, the performance of candidates showed an improvement on 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 how many marks were 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 an incomplete 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 that their responses 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 candidates, 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 wording.

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.

Comments on Specific Questions.

Question 1

Part **(a)** of this question was generally very well answered. The majority of candidates produced an annotated sketch that clearly showed that plywood was made from an odd number of layers of veneer with the grain of one layer running at right angles to the next.

In part **(b)(i)**, very few candidates knew what a jig was. Most responses shown either some form of template being used to mark out the dividers or described how one of the dividers could be cut to length.

The better answers showed a jig in which the work could be held firmly and then cut to the required length without the need for marking out.

Most candidates gained at least half credit for their answers to part **(b)(ii)** by describing, with varying degrees of success, how tools such as saws, chisels and routers could be safely used to make the joint. Some of the weaker responses suggested that the whole joint could be cut out using a chisel and mallet.

The vast majority of candidates were able to describe at least some of the stages involved in applying a painted finish to the CD rack. The better answers described how the rack would need to be prepared for painting, how sealer and/or undercoat could be applied by brush or spray, how the rack would then need to dry and be rubbed down before further coats were applied. Safety precautions such as working in a well ventilated area and wearing protective clothing were frequently identified.

Question 2

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

Very few correct answers were seen to part **(a)**, with most candidates incorrectly suggesting that paint would be a suitable finish.

Correct answers included varnishing or laminating. Appropriate reasons for using a finish included the fact that it strengthened the card or it gave it a glossy finish.

In part **(b)**, most candidates sketched some form of slot and tab many of which had the potential to work. Fewer or the responses went on to describe how the slot and tab could be cut out and used to hold the base securely in a closed position.

The majority of developments (nets) that were sketched in part **(c)** were produced to an appropriate scale and showed four sides and a base. Fewer of the answers included all of the additional features required to make the money box. These additional features were the money slot, the glue tab and the slot and tab fixing.

A few very good answers were seen to part **(d)**, but the vast majority of responses showed an incomplete knowledge and understanding of the die cutting process. Where a response had been produced, it usually described how a craft knife could be used to cut out the money slot rather than a die cutter.

Question 3

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

The vast majority of candidates answered part **(a)** very well and gained all of the available credit. Acrylic was the material that most candidates suggested as being suitable for making part **A**. Other appropriate materials included polystyrene, aluminium and stainless steel. Suitable reasons for choice included that the material was waterproof, it required no surface finish and, particularly in the case of acrylic, was easy to bend.

In part **(b)(i)**, the better answers frequently came from the candidates who had chosen to use acrylic for making part **A**. Most of these responses described, with varying degrees of success, how the acrylic could be heated and bent to the required shape using formers. The better responses described how the acrylic could be heated in an oven while others suggested the use of a strip heater. This would have been a less appropriate method in this situation. The responses from candidates who had chosen to use materials other than plastic frequently lacked the level of detail required to gain high credit.

Some very good answers were seen to part **(b)(ii)**. Most candidates gained over half marks by describing how tools and equipment such as saws, rasps, files, sanding discs and abrasive paper could be used to cut out part **B** and smooth the edges of the plywood. Most went on to describe how the holes could be drilled with the better responses making use of a hole saw to produce the larger hole. Almost all responses included at least some safety precautions such as the need to secure the work firmly when drilling, etc. and to wear appropriate safety equipment.

The better answers to part **(b)(iii)** were those that identified screws as being the most suitable way of fixing parts **C** and **D** together. These answers then went on to describe, stage by stage, how this fixing method could be achieved. Stages needed to include drilling and countersinking holes and the use of a screwdriver to put the screws in. A fair number of over complex and inappropriate fixing methods were seen many of which would not have securely joined the two parts together. Solutions that would have partially have worked, such as hinges, were given some credit.

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 more candidates made use of the structure and mark allocation given in part **(d)** than in previous years the major weakness in many answers continues to relate to the levels of 'discussion' that takes place in candidates' responses.

Future candidates are 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 wording.

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 Specific Questions

Question 4

Part **(a)** was reasonably well answered with the majority of candidates gaining at least partial credit. Many understood that the feature was related to fixing the cardboard tray together but fewer explained the function of the feature in sufficient detail to gain full credit. Answers needed to clearly explain how the tab went into the slot and 'locked' the parts of the box together. In a few cases candidates did not use a sketch as part of their answer.

In part **(b)**, a good number of candidates correctly described at least one problem with the design of the tray. Problems needed to relate to the fact that it would be difficult to get forms out of the tray and not being able to see the lettering when the tray was full of forms.

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 removing part of the front of the tray and making the back of the tray higher so that the lettering could be moved up or putting the lettering somewhere else on the tray. A number of good answers were seen.

The majority of candidates identified some appropriate issues in part **(d)** and a good number explained, with varying degrees of success, why they were important. Fewer went on to offer any specific evidence to support any conclusions they had made.

Question 5

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

Part **(a)** was well answered by the vast majority of candidates. Most gained full credit by explaining that the feature was a slot or handle that enabled the user to lift the chair easily.

In part **(b)**, perhaps as a result of not reading the question carefully enough, a number of candidates did not identify problems with design **A** that made it unsuitable for use as a stacking chair. Problems needed to relate to it not being possible to stack the chair because of the cross rail and because the frame was wider than the seat. The problem most commonly identified problem was the one related to the position of the cross rail.

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Candidates could have improved their performance in parts **(b)** and **(c)** by analysing the information given in the question more carefully.

Part **(d)** was generally answered well. A good number of answers were based around the identification of appropriate issues the choice of which candidates went on to justify. A reasonable number of responses included the use of specific examples/evidences to support the conclusions that had been made by the candidate.

Question 6

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Part **(a)** was generally well answered with the vast majority of candidates explaining that the symbol meant that a substance or material was inflammable and could easily catch fire.

In part **(b)**, the problems identified by some candidates too general and did not apply specifically to a safety poster. Appropriate problems needed to relate to safety issues such as the person was not wearing a mask and was not working in a well ventilated area (the window was closed).

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Part **(d)** required candidate to discuss the functional and aesthetic effects of applying a surface finish or treatment to a product. Very few good answers were seen to this part of the question.

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.

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A good number of excellent rendered pictorial drawings were seen in part **(d)**. However in some responses the rendering was not attempted or was poorly done. 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 Specific Questions

Question 7

In general, this question was well answered with reasonable responses being seen to most parts of the question. The quality of both the sketching and written communication produced by the majority of candidates was of a good standard.

In part **(a)** of the question, the majority of candidates produced appropriate designs for the plastic insert. Most considered, with varying degrees of success, how their designs could prevent the model car from moving in the box. A requirement of the question was that the insert should be made from plastic. Perhaps as a result of not reading the question carefully enough some candidates suggested the use of other material, such as card, to make the insert. The better designs were generally those that used some for of indents in the insert for the wheels of the car to fit in. A number of over complex designs were seen.

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The quality of the answers to part **(c)** was very mixed. While a good number of responses made some attempt to show lettering that reflected the name of the car, the quality of the design work was frequently not

very good. The better responses were generally those that formed the lettering into an elliptical shape or placed the lettering in an ellipse. These responses frequently went on to consider colour and where the design would be placed on the box.

In part **(d)**, the majority of candidates produced a pictorial view and made at least some attempt to use colour. The better responses were those that showed an open box with the insert partly pulled out of the box. However, most responses showed the box closed which made it almost impossible to show any details about the insert. The letter was generally poorly drawn and often produced in 2D rather than pictorial form. Some responses made good use of tonal shading but a good number of multi coloured drawings was seen. A number of incomplete drawings were seen.

Question 8

This proved to be by far 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 and frequently very good standard respectively.

In part **(a)** of the question, the majority of candidates produced appropriate designs that would have allowed up to 20 coats to be hung on the trolley. The better designs were generally those that used some form of rail system which was joined to the bottom of the trolley by one or more supports. A number of over complex, and sometimes unsafe, designs were seen. A good number of responses had not taken the size of the end user into account and produced designs that would have been difficult for young children to use.

Almost all of the responses to part **(b)** allowed for at least 20 pairs of shoes to be stored on the trolley; but frequently it was not the required number of up to 20 pairs.

The better answers were generally those that used some form of simple shelving divided up to provide the required number of spaces. A number of over complex, and sometimes inappropriate, designs were seen. Many of these designs would have been difficult to use. A good number of responses had not taken into account the design of the hanging system produced in part **(a)** and produced ideas for shoe storage systems that would have made it difficult to use and/or attach the hanging system.

A fair number of potentially workable handle designs were seen in part **(c)**. The better designs were those that had considered comfort, ease of use, safety and how the handle could be easily fixed to and removed from the trolley. As with other parts of the question, some over complex designs were seen.

A good number of excellent rendered drawings were seen in part **(d)**. However, in some responses, the rendering was not attempted or was poorly done. A few 2D drawings were produced which could only gain very limited credit.

Question 9

This was the least popular of the questions in this section of the paper. The quality of both the sketching and written communication produced by the majority of candidates was of a good standard.

In part **(a)**, the better responses showed designs for both the shelf and the system that would both support the shelf and allow it to be pulled out and pushed back under the desk. The weaker designs generally focused on just the shape of the shelf. A good number of answers did not include any details about how the pull out shelf would be attached to the frame.

The better responses to part **(b)** were those that included designs that showed the shape and size of the folding flap, how it would be attached to the frame so that it could fold down and how it could be supported in a horizontal position. Only a limited number of responses included all of these features. Some responses failed to take into account the design of the pull out shelf that had been produced in part **(a)**. This frequently resulted in flaps that would not fully function or would prevent the shelf being pulled out.

In general, part **(c)** of the question was poorly answered. Many responses failed to take into account the size of the shelf unit and/or the fact that the shelves had to be adjustable. The better responses were those that designed a rectangular shelf unit that was 500 wide, 150 deep and 750 high and used a simple method to make it possible to adjust the shelves inside the unit. The most successful of the methods seen used pegs or dowels that fitted into holes in the sides of the unit. The shelves rested on the pegs or dowels and could be adjusted by changing the positions of the pegs or dowels.

The quality of the drawings produced in part **(d)** was very mixed. While a number of high quality rendered drawings were seen, some responses did not include all of the features that had been designed in parts **(a)-(c)**. The better responses showed the shelf pulled out as well as its supporting system, the folding flap along with the methods of attaching it to the frame and holding it in a horizontal position and the adjustable shelving unit.

DESIGN AND TECHNOLOGY

Paper 9705/13
Written 1

General Comments

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 credit 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 demonstrated incomplete 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. 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. The quality of sketching was very mixed.

A number of poorly produced very small sketches were seen. Candidates need to understand that the use of lots of continuous text should be avoided when answering questions in this section of the paper. In a number of responses, there was too much continuous text often accompanied by very few sketches.

Comments on Specific Questions

Question 1

This proved to be a reasonably popular question.

Part **(a)** was frequently well answered. In part **(i)**, pine was the most common softwood that was named. A range of different sheet materials were named in part **(ii)** such as plywood, hardboard and MDF. Various types of metal were also suggested and, whilst not totally suitable in this situation, were given credit.

In part **(b)(i)**, most candidates described, with varying degrees of success, how tools such as saws, rasps, files, sanding discs and abrasive paper could be used to cut out and smooth the edges of two ends of the handle. Fewer candidates correctly described the use of a flat bit or a hole saw which would have been the most suitable tools to use to drill the holes in the end pieces. The better answers described how a piece of dowel could be cut and glued into the holes. Some candidates made their answers too complex by trying to describe how the round piece would need to be made on a lathe.

Most candidates gained at least half credit for their answers to part **(b)(ii)** by describing, with varying degrees of success, how tools such as saws, chisels and routers could be safely used to make the joint. Some of the weaker responses suggested that the whole joint could be cut out using a chisel and mallet.

Part **(b)(iii)** of the question required candidates to describe how the bottom of the toolbox could be glued and nailed to the sides. Those candidates who had chosen to use metal for the bottom frequently, incorrectly, suggested that the nails could be knocked through the metal without first drilling small holes. The better answers were those that described how lines would need to be marked on the wooden bottom to show where to position the nails, went on to identify a specific glue and then described how a hammer could be used to knock in the nails.

Question 2

This was the least popular of the questions in this section of the paper and was generally not very well answered.

The better answers to part **(a)** were those that showed the four sides and bottom of the box all drawn to the correct shape and in the correct position along with the four glue tabs that were required to join the desk tidy together. Very few fully correct developments (nets) were seen. A common error was to draw the front and/or the back the wrong shape to make the base square rather than rectangular. In a few cases candidates appeared to have an incomplete knowledge and understanding of how to draw a development (net).

Part **(b)** was answered very well by the vast majority of candidates. Most produced a good quality annotated sketch that clearly showed what corrugated cardboard looked like.

The better answers to part **(c)** showed how a cross halving joint good be cut in the two pieces of corrugated cardboard to produce the required divisions. Most answers described the use of a cutting knife to make the required cuts but fewer described the need to use a safety rule and cutting mat. Few good quality sketches that showed how the two pieces would be assembled were seen.

The answers to part **(d)** were mixed both in terms of the depth of content and the quality of sketching and written communication. A few very good responses were seen. These described how a stencil could be cut out from thin sheet material, such as card or plastic, using a craft knife, safety rule and cutting mat. These went on to describe how the stencil would be secured in the correct place using, for example, masking tape, and then the ink or paint applied. Most suggested the use of spray paint with but only some including details about the safety precautions involved. Some of the answers seen showed incomplete understanding of what a stencil was or how it could be made and used.

Question 3

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

Part **(a)** was well answered by the majority of candidates. Most named acrylic as being a suitable sheet material for making part **A** and went on to give an appropriate reason for its choice such as it could be easily bent and that it did not require a surface finish. Other suitable sheet materials included polystyrene and aluminium.

In part **(b)(i)** most candidates gained at least half credit by describing, in varying degrees of detail how tools and equipment such as saws, files, sanding discs and abrasive paper could be used to cut out and smooth the edges of part **A**. Details of appropriate safety precautions were not always given.

Some good answers were seen to part **(b)(ii)** with candidates describing, with varying degrees of success how the material they had chosen in part **(a)** could be bent. The better responses frequently came from candidates who had chosen to use acrylic. These candidates were able to describe, at least in part how a strip heater and formers could be used to bend part **A** to the required shape. Where candidates had chosen

to use sheet metal their answers were generally not very good; often consisting of describing how the metal could be fixed in a vice and hit with a hammer. Details of the safety precautions required, such as wearing leather gloves when using a strip heater, were often not included.

The better answers to part **(b)(iii)** described how clearance holes would be to be drilled in part **A** and pilot holes drilled in the pine. The clearance holes would need to be countersunk and the screws inserted using some form of screwdriver. It was rare to see an answer that included sufficient details about all of these aspects. A common error was to have the screws going through the pine first and attempting to screw them into the sheet material.

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 candidates. While more candidates made use of the structure and mark allocation given in part **(d)** than in previous years, the area for improvement in many answers continues to relate to the quality of 'discussion' that takes place in candidates' responses.

Future candidates are 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 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.

Comments on Specific Questions

Question 4

In part **(a)** a reasonable number of candidates described at least one of the problems with the design of the model of a bird. Problems needed to relate to the two parts not joining together properly because the slots were not long enough and the model not standing up very well because it was 'top heavy'.

The better answers to part **(b)** used notes and sketches to explain how the design would need to be changed in order that the two parts fit together properly and make the model stable. While most responses indicated that the slots needed to be made longer few showed that each of the slots would need to be half the height of the bird. The better solutions to the problem of stability were those that increased both the length and the width of the feet. Some responses only increased the size of the feet in one direction or added extra pieces of card in an attempt to improve stability.

Part **(c)** was answered well by the vast majority of candidates. Almost all responses correctly stated that the first symbol meant that the card could be recycled. Slightly fewer candidates were able to identify correctly that the second symbol meant that currently the plastic could not be recycled.

Part **(d)** was generally answered well. A good number of answers were based around the identification of appropriate issues the choice of which candidates went on to justify. A reasonable number of responses included the use of specific examples/evidences to support the conclusions that had been made by the candidate.

Question 5

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

In part **(a)**, the majority of the candidates correctly identified that the design feature was a finger cut-out that enabled the bottle to be easily removed from the holder.

In their answers to part **(b)**, the majority of candidates identified that the finger cut-out was missing from the design of the former which would result in the vacuum-formed holder not being complete when it was manufactured. Far fewer went on to identify the other key problems of there being sharp corners and vertical sides on the former. These problems would have made it hard to remove the holder from the former when it had been manufactured and could have resulted in the plastic being punctured while it was being manufactured.

The majority of responses to part **(c)** correctly showed how the finger cut-outs would need to be added to the design of the former. Fewer responses showed how rounded corners and/or the sloping sides would need to added to the design of the former. Some candidates viewed **Fig. 7** as the final vacuum formed holder and incorrectly tried to explain how the finger cut-outs could be cut out after the plastic had been formed.

A few very good answers were seen to part **(d)**. The general standard of responses, both in terms of the issues identified and the level of discussion that took place was mixed. A good number of candidates focused their responses too much on issues linked with recycling plastic rather than 'why plastic is often referred to as a non-renewable material'.

Question 6

A few excellent answers were seen to part **(a)**. These responses used a high quality sketch to clearly show how the given knock-down fitting could be used to join the legs and the rails of the table. The majority of candidates, however, gained half credit by displaying a limited understanding about how the fitting could be used.

The majority of candidates gained at least some of the credit available in part **(b)** by identifying and describing, with varying degrees of success, problems that made design **B** unsuitable for use as a nesting table. Appropriate responses needed to relate to there being too many legs and rails.

The better responses used notes and sketches to good effect to explain that by removing one leg and three of the rails the design could function as a nesting table. Most answers, however, only removed some of parts that were not required or produced over complex designs some of which completely changed the design of the table.

A number of good answers were seen to part **(d)** showing that a fair number of candidates were familiar with the use of knock-down fittings in the mass production of furniture. A good number were able to identify appropriate issues, justify why they were relevant or important and in most cases use examples and evidence to support their discussions and conclusions.

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 a 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 should 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.

Development should be seen as more than re-drawing one of the initial ideas better. 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 incomplete evidence of design development and just selected one of their ideas. Some did not take sizes into account or 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 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.

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)**. Some poor quality illustrations were seen in part **(d)**.

Comments on Specific Questions

Question 7

Part **(a)** was generally reasonably well answered and almost all candidates produced designs for a frame that had the potential to work. A good number of the responses only considered the shape of the frame often not considering how the parts could be fixed together or how the frame could be attached to the top. It was rare to see any details about size. The question stated that the frame should be made from metal tube; some designs did not meet this requirement. Some overcomplicated, sometimes unworkable designs were seen.

In part **(b)**, the better responses showed designs for both the shelf and the system that would support the shelf and allow it to be pulled out and pushed back under the desk. The weaker designs generally focused on just the shape of the shelf. A good number of answers did not include any details about how the pull out shelf system would be attached to the frame. Sizes were generally not considered.

Only a very few appropriate responses were seen to part **(c)**. Most responses did not take full account of the size and number of different leaflets that the unit would need to hold. It was rare to see drawn details about construction or where the unit would be positioned on the desk.

The quality of drawings produced in part **(d)** was mixed. While some reasonable drawings were seen, a number were not well produced often not taking into account the size and proportion of the various parts of the final design. Rendering was generally not very well done and in some cases not attempted.

Question 8

In part **(a)** of the question, the majority of candidates produced appropriate designs for the plastic insert. Most considered, with varying degrees of success, how their designs could prevent the chocolates from moving in the box. A requirement of the question was that the insert should be made from plastic. Perhaps as a result of not reading the question carefully enough some candidates suggested the use of other materials, such as card, to make the insert. Some designs did not consider the number of chocolates that the insert needed to hold. The sizes of both the box and the chocolates were often not taken into account. A number of over-complex designs were seen.

Part **(b)** was reasonably well answered. The majority of candidates produced designs that addressed the requirements of the question. A few candidates produced designs that were made from more than one piece of card, for example, a card tray which slid into an outer sleeve. The better solutions were those that showed the shape of the box, how the box would open and close, the windows and, most importantly, the

development (net) required to make the box. A fair number of candidates only looked at the shape of the box.

The quality of the answers to part **(c)** was very mixed. Whilst a good number of responses made some attempt to show lettering that reflected the name of the chocolates, the quality of the design work was frequently not very good. The better responses were generally those that made use of squares and circles in their designs either to form the letters or as background shapes. These responses frequently went on to consider colour and where the design would be placed on the box.

In part **(d)**, the majority of candidates produced a pictorial view and made at least some attempt to use colour. The better responses were those that showed an open box with the insert partly pulled out of the box. However, most responses showed the box closed which made it almost impossible to show any details about the insert. The lettering was generally not well drawn and often produced in 2D rather than in pictorial form. Some responses made good use of tonal shading but a good number of multi coloured drawings were seen. A number of incomplete drawings were seen.

Question 9

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

While most of the base designs produced in part **(a)** had the potential to work, many lacked the technical details required about how they could be constructed and/or attached to the vertical support. Most responses had considered ways of keeping the bird table stable. It is important that ideas are distinctly different. In some cases, candidates had drawn the same design several times and just suggested that each one should be made from a different material.

Many of the roof designs produced in part **(b)** had the potential to work but some would have made it very difficult for birds to gain access to the platform. In some cases, the designs were more appropriate for a bird nesting box rather than a bird table. As with part **(a)**, many responses lacked the level of details required about how they could be constructed and or attached to the platform. A number of over-complex designs were seen.

A number of good answers were seen to part **(c)**. The better designs used some form of ring or platform that was attached to the vertical support and would hold the water bowl. A number of designs incorrectly suggested that the water bowl could be placed on the platform. This is, perhaps a case where candidates had not read the question carefully enough and/or not taken size into account. Sufficient details about how the design would be constructed and attached to the vertical support were not included in many responses.

The quality of drawings produced in part **(d)** was mixed. While some reasonable drawings were seen, a number were not well produced, often not taking into account the size and proportion of the various parts of the final design. Rendering was generally not very well done and in some cases not attempted.

DESIGN AND TECHNOLOGY

Paper 9705/02

Project 1

Key Messages

- Candidates are advised not to spend time researching materials, construction methods, fittings and finishes as part of the analysis of and research into the design brief, as this cannot be awarded credit in this section of the assessment scheme. Data collected should relate to the design problem, not any anticipated product outcome.
- Coursework submissions that combine Project 1 and Project 2 in an integrated way should offer clear evidence that some form of modelling has been produced for Project 1 and a final product for Project 2. The design folder should include clear photographic evidence of both these pieces of practical work.

General comments

Centres are encouraged to use an approach that is appropriate to their own situation when introducing this important part of the Design and Technology course to their candidates, so long as evidence can be produced that matches the requirements of the assessment scheme. Some set a common theme or topic to which candidates respond in their own way, while others encourage their candidates to identify their own design problem which may be derived from hobbies, interests or life at home or in the community. In any event, outcomes resulted from a wide variety of design problems and it was obvious that many candidates had developed a keen interest in the area being studied.

In addition to the usual range of household items, interesting outcomes of either modelling or final products included a vegetable sieve, shopping trolley, herb storage, tool trolley, aids for disabled, sports memorabilia display, art studio equipment, cooker for rural areas, artificial fishing bait, greenhouse, towel drier, child's slide, camping storage unit, off-road trailer, school locker, dog basket, pool chair, tollgate booth, cycle trailer, bicycle stand, folding coat hanger, chicken coop, surf board, recycle bin, solar speaker backpack, drinks warmer, newspaper storage system, pencil sharpener, street lighting, alternative fuel model car, starting blocks, scoreboard, metal press, solar turbine, exercise machine, model catamaran and railway crossing gates. Several projects resulted in well made architectural models, the appropriateness and standard of which have improved as more experience has been gained in this approach to Design and Technology.

It was pleasing to see that many Centres had encouraged their candidates to present design folders neatly and in such a way that the design process could be followed easily.

Comments on Specific Assessment Criteria

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

The majority of candidates made it very clear how their chosen design problem linked to both the user and the situation. This was then supported by a precise design brief leaving the reader in no doubt as to the design route being followed.

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

Most candidates considered a wide range of existing products and commented on these in relation to their own design brief. It is important that there is a thorough analysis of the actual design problem being undertaken so as to give direction to the identification and collection of relevant data. This is a very important part at this stage of a design process as it provides information from which an accurate and meaningful specification can be formulated.

Centres are reminded that the inclusion of historical records of an area or topic being considered cannot be awarded credit as they do not form part of a design process.

Specifications were generally well formulated and included many specific requirements of the product to be designed.

3. Generation and appraisal of design ideas

It was pleasing to see so many candidates showing a high degree of flair in the creation of ideas and this is to be applauded. Unfortunately, a few candidates presented a range of drawings not linked to the specification or even commented upon regarding their possible suitability for the problem being considered. In these cases it is not really possible to award credit above the lowest band set out in the assessment criteria.

The importance of presenting a wide range of different ideas, however impractical they may appear at the time, cannot be understated and these should then be considered with some form of written appraisal alongside each. Where ideas have touched on aspects of the specification, they should be commented on or highlighted in some way.

Many candidates should be congratulated on the range and high standard of communication techniques used in the presentation of design proposals. Where care is taken in this respect, it is easier to see how a candidate's thought process has developed.

4. Modelling of ideas

Modelling should be seen as one stage of the consideration, testing and evaluation of design ideas, so that a final design can be presented and subsequently developed. Many candidates produced high quality and meaningful models that formed part of this process, whereas others simply produced a mock-up of the chosen design idea, and it was sometimes difficult to identify how it made a contribution to the design process.

The Moderator was pleased to see that more candidates are modelling different aspects of their design ideas and using these to test for suitability and practicality in the production of a complete solution to their design problem. In this way, the modelling stage plays a more meaningful part in designing.

DESIGN AND TECHNOLOGY

Paper 9705/31
Written 2

General comments

Candidates were generally well prepared for this paper and there were very few rubric errors.

The majority of candidates used the time available effectively and made full attempts at all sections of the paper this year. A significant number, however, only answered one question from ***Section A*** or produced very brief responses.

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***. A small number of candidates answered ***Section B*** only.

Some candidates attempted more than two questions from ***Section A***.

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

Most candidates fully completed all of the requirements for ***Section B***. Some candidates copied out the question or reworded the situation. This is unnecessary and uses up valuable time.

It is important that candidates are able to practice this examination under timed conditions.

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

In Part **A**, **Question 1** was the most popular followed by **Question 3**. **Question 6** was the most popular followed by **Question 4** in Part **B**. Very few candidates attempted **Question 5**. **Questions 7** and **9** were the most popular in Part **C**.

In ***Section B***, **Question 10** was the most popular followed by **Question 12**.

Comments on specific questions

Section A

Part A – Product Design

Question 1

The most popular question and generally well answered. Some candidates did not allocate a proportionate amount of time for this question. Whilst there were a number of excellent responses, a significant number lacked the appropriate detail to access higher credit.

The most popular processes chosen were extrusion and blow moulding.

(a) The best responses used appropriate sketches to describe the key aspects of the process chosen. Candidates described the mould shape for blow moulding the water cooler bottle and the die arrangement for extruding the section of tube.

(b) Most candidates were able to give at least one reason why the process was suitable for the item; long lengths of regular section for extruding and very quick production of a large hollow shape for blow moulding.

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

Question 2

Only a few candidates attempted this question. The best responses used annotated sketches to describe in detail the cutting actions of two of the selected tools, giving details of cutting and or clearance angles. Whilst there were very few good responses to part **(a)**, many candidates correctly described the correct maintenance of tools to ensure effective cutting actions for part **(b)**.

Question 3

(a) The most popular correct response given for an appropriate material was acrylic. Plywood and aluminium were also popular responses. Most correctly gave appropriate reasons such as: good aesthetic qualities, easily shaped and self-finishing for acrylic and easily formed, accepts a good finish for plywood.

Some candidates offered acceptable materials but did not give appropriate reasons or describe the correct manufacturing method for that material.

(b) Candidates answered this part of the question very well. Most candidates correctly described the shaping, finishing, forming and joining of the material.

There were a few responses for the holder that were inappropriate, such as compression moulding and injection moulding. The question asked, "...how you would make the holder".

This response disadvantaged candidates for part **(c)** as they had already used a preferred industrial manufacturing method.

Candidates used annotated sketches very well in this question.

(c) Most candidates simplified the design to enable the use of templates, jigs and moulds to manufacture the holders. Some candidates incorrectly chose injection moulding as a manufacturing method. A low quantity of 50 would not be manufactured using a commercial method more suited to high volume production.

Part B - Practical Technology

Question 4

Relatively few candidates attempted this question.

(a) Most candidates answered all parts correctly.

(b) There were some very detailed answers to this part question. Most responses however were very brief and did not comply with the instructions relating to answering questions with the instruction 'discuss', as outlined on the front of the question paper.

Question 5

There were very few attempts at this question. Most responses were fully detailed with candidates selecting appropriate products to describe the working principles of the four mechanisms.

Candidates made excellent use of annotated sketches.

Question 6

There were few attempts to this question. Answers were generally good. All candidates stated correct materials that were appropriate for use in outdoor environments, not all could describe the reasons/properties that made them suitable.

Methods of treatments were stated for part **(b)** but most candidates did not describe the treatment.

Answers to part **(c)** were varied. Some candidates had a good knowledge and understanding of different alloys and explained their benefits to engineers and product designers. A number of candidates did not attempt this part.

Part C – Graphic Products

Question 7

Generally well answered. Many candidates correctly produced an accurate and fully detailed isometric drawing of the trophy.

Most candidates clearly used correct construction techniques to draw the circular base and ellipse in isometric projection. Centres are reminded to instruct candidates to include all constructional detail.

It is important that candidates check the dimensions on the original drawing. A significant number drew the base as a square prism.

Question 8

There were relatively few responses to this question. Some answers were fully detailed, outlining and explaining a number of issues relating to reducing lead-time through quality control, appropriate manufacturing methods and using CAD/CAM. Relevant examples were used to support answers.

Question 9

There were a number of very good responses to this question.

(a) (i) The majority of candidates answered correctly 3rd angle orthographic projection.

(ii) Most candidates correctly explained why orthographic projection is the preferred choice for production drawings. Accurate and clear dimension/scaling and universal usage were the main reasons given.

(b) Very well answered. Most candidates had a good understanding of the application of anthropometric data when designing.

(c) A wide range of responses to this part. Most candidates had a clear knowledge and understanding of commercial issues relating to marketing products and the importance of target markets. Some candidates did not attempt this part.

Section B

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

The overall performance of candidates on this section was generally good. Most candidates used their time effectively and fully completed all requirements of the questions attempted.

Some candidates copied out the question or rewrote the question as part of their analysis; this is unnecessary.

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

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

The analysis and specification sections continue to improve. For most candidates, the analysis, in the form of scatter-charts or lists, was focused on the requirements of the given problem.

Some candidates produced generic charts that had no specific reference to the problem and received little credit.

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 credit.

The majority of candidates produced a range of at least three discrete and different design ideas, many including the exploration of sub-problems. A significant number of candidates did not explore a range of ideas or sub-ideas. Some focussed too early on a solution and consequently did not access the middle and higher mark ranges.

The majority of candidates annotate their work well, giving design details relating to the specification and suggesting appropriate specific materials and construction methods. Evaluation is clearly evident from many candidates in the exploration of ideas section; this is to be encouraged.

A number of candidates employed tick lists to evaluate their ideas and identify a chosen solution. They are not always appropriate unless they are appropriately qualified. The higher credit is gained when candidates give evaluative comments on their ideas and can make a reasoned judgement on the best solution or features to take forward for further development.

Many candidates reproduced a selected idea from the exploration stage and justified the materials and constructional methods in the development section. A number produced detailed stages of manufacture; which is not required. Candidates are again advised to not include superficial development of features such as ‘round off corners’.

To achieve the higher mark range, candidates must include evidence of their decision making to show the improvements or modifications to their idea(s) leading to a single design proposal.

Most proposed solutions were feasible and well presented.

Most candidates included overall dimensions in their final proposal; for full credit 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, functional details and suggesting further modifications or improvements. Many candidates copy 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

This question was generally well answered with a full range of responses. Some candidates produced outstanding responses; innovative solutions that were exceptionally well presented.

Acceptable specification points included:

- the product must be robust to take the wear and tear of regular use by candidates;
- the product must be adjustable or be able to accommodate different body sizes;
- the product must have some form of shade or protection from adverse weather conditions;
- the product must be made from materials which can withstand outdoor weather conditions;
- the product must be stable in use but have a system to enable easy movement for storage.

Most candidates produced a wide range of possible solutions, selecting and justifying appropriate materials.

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 poor; few candidates made specific reference to the final proposal and suggested possible improvements.

Question 11

Relatively few candidates attempted this question. Some candidates were able to draw on their mechanical knowledge to propose effective solutions. A significant number of candidates produced outline solutions with little evidence of how they would work. Some interpreted the brief as a step or stair arrangement and were awarded credit where appropriate. The requirement was for a hand held device.

Acceptable specification points included:

- the device must hold products in a manner that would not damage them;
- the device must be lightweight so as not to tire the user or become difficult to use;
- the device must have a simple operation to use quickly and effectively;
- the device must be adjustable to accommodate different shelf heights.

Constructional and material details were generally poor.

The most successful ideas employed simple mechanisms to produce a basic ‘grab’ arrangement.

Question 12

There was a wide range of responses to this question. Many candidates had a clear knowledge and understanding of ‘pop-up’ mechanisms in card and were able to explore a range of creative and effective proposals. Some candidates did not include additional features, producing basic outlines of simple fold cards.

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

Acceptable specification points included:

- the card must be visually effective to promote the shop;
- the card must include all relevant details of the shop, contact, location, etc.;
- the card must be of a professional standard of construction to impress future customers;
- the card feature must work effectively, every time it is opened.

The best responses looked at a wide range of card shapes and pop-up systems. They included details of a range of appropriate specific graphic materials and printing methods.

A number of candidates only considered one material, card. To achieve the higher mark range, different specific types of card and/or other appropriate materials should be considered. The development section was generally poor with very few candidates giving details of appropriate construction methods, particularly when using card.

DESIGN AND TECHNOLOGY

Paper 9705/32
Written 2

General comments

Candidates were generally well prepared for this paper and there were very few rubric errors.

The majority of candidates used the time available effectively and made full attempts at all sections of the paper this year. A significant number, however, only answered one question from ***Section A*** or produced very brief responses.

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***. A small number of candidates answered ***Section B*** only.

Some candidates attempted more than two questions from ***Section A***.

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

Most candidates fully completed all of the requirements for ***Section B***. Some candidates copied out the question or reworded the situation. This is unnecessary and uses up valuable time.

It is important that candidates are able to practice this examination under timed conditions.

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

In Part **A**, **Question 1** was the most popular followed by **Question 3**. **Question 6** was the most popular followed by **Question 4** in Part **B**. Very few candidates attempted **Question 5**. **Questions 7** and **9** were the most popular in Part **C**.

In ***Section B***, **Question 10** was the most popular followed by **Question 12**.

Comments on specific questions

Section A

Part A – Product Design

Question 1

The most popular question and generally well answered. Some candidates did not allocate a proportionate amount of time for this question. Whilst there were a number of excellent responses, a significant number lacked the appropriate detail to access higher credit.

The most popular processes chosen were extrusion and blow moulding.

(a) The best responses used appropriate sketches to describe the key aspects of the process chosen. Candidates described the mould shape for blow moulding the water cooler bottle and the die arrangement for extruding the section of tube.

(b) Most candidates were able to give at least one reason why the process was suitable for the item; long lengths of regular section for extruding and very quick production of a large hollow shape for blow moulding.

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

Question 2

Only a few candidates attempted this question. The best responses used annotated sketches to describe in detail the cutting actions of two of the selected tools, giving details of cutting and or clearance angles. Whilst there were very few good responses to part **(a)**, many candidates correctly described the correct maintenance of tools to ensure effective cutting actions for part **(b)**.

Question 3

(a) The most popular correct response given for an appropriate material was acrylic. Plywood and aluminium were also popular responses. Most correctly gave appropriate reasons such as: good aesthetic qualities, easily shaped and self-finishing for acrylic and easily formed, accepts a good finish for plywood.

Some candidates offered acceptable materials but did not give appropriate reasons or describe the correct manufacturing method for that material.

(b) Candidates answered this part of the question very well. Most candidates correctly described the shaping, finishing, forming and joining of the material.

There were a few responses for the holder that were inappropriate, such as compression moulding and injection moulding. The question asked, "...how you would make the holder".

This response disadvantaged candidates for part **(c)** as they had already used a preferred industrial manufacturing method.

Candidates used annotated sketches very well in this question.

(c) Most candidates simplified the design to enable the use of templates, jigs and moulds to manufacture the holders. Some candidates incorrectly chose injection moulding as a manufacturing method. A low quantity of 50 would not be manufactured using a commercial method more suited to high volume production.

Part B - Practical Technology

Question 4

Relatively few candidates attempted this question.

(a) Most candidates answered all parts correctly.

(b) There were some very detailed answers to this part question. Most responses however were very brief and did not comply with the instructions relating to answering questions with the instruction 'discuss', as outlined on the front of the question paper.

Question 5

There were very few attempts at this question. Most responses were fully detailed with candidates selecting appropriate products to describe the working principles of the four mechanisms.

Candidates made excellent use of annotated sketches.

Question 6

There were few attempts to this question. Answers were generally good. All candidates stated correct materials that were appropriate for use in outdoor environments, not all could describe the reasons/properties that made them suitable.

Methods of treatments were stated for part **(b)** but most candidates did not describe the treatment.

Answers to part **(c)** were varied. Some candidates had a good knowledge and understanding of different alloys and explained their benefits to engineers and product designers. A number of candidates did not attempt this part.

Part C – Graphic Products

Question 7

Generally well answered. Many candidates correctly produced an accurate and fully detailed isometric drawing of the trophy.

Most candidates clearly used correct construction techniques to draw the circular base and ellipse in isometric projection. Centres are reminded to instruct candidates to include all constructional detail.

It is important that candidates check the dimensions on the original drawing. A significant number drew the base as a square prism.

Question 8

There were relatively few responses to this question. Some answers were fully detailed, outlining and explaining a number of issues relating to reducing lead-time through quality control, appropriate manufacturing methods and using CAD/CAM. Relevant examples were used to support answers.

Question 9

There were a number of very good responses to this question.

(a) (i) The majority of candidates answered correctly 3rd angle orthographic projection.

(ii) Most candidates correctly explained why orthographic projection is the preferred choice for production drawings. Accurate and clear dimension/scaling and universal usage were the main reasons given.

(b) Very well answered. Most candidates had a good understanding of the application of anthropometric data when designing.

(c) A wide range of responses to this part. Most candidates had a clear knowledge and understanding of commercial issues relating to marketing products and the importance of target markets. Some candidates did not attempt this part.

Section B

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

The overall performance of candidates on this section was generally good. Most candidates used their time effectively and fully completed all requirements of the questions attempted.

Some candidates copied out the question or rewrote the question as part of their analysis; this is unnecessary.

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

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

The analysis and specification sections continue to improve. For most candidates, the analysis, in the form of scatter-charts or lists, was focused on the requirements of the given problem.

Some candidates produced generic charts that had no specific reference to the problem and received little credit.

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 credit.

The majority of candidates produced a range of at least three discrete and different design ideas, many including the exploration of sub-problems. A significant number of candidates did not explore a range of ideas or sub-ideas. Some focussed too early on a solution and consequently did not access the middle and higher mark ranges.

The majority of candidates annotate their work well, giving design details relating to the specification and suggesting appropriate specific materials and construction methods. Evaluation is clearly evident from many candidates in the exploration of ideas section; this is to be encouraged.

A number of candidates employed tick lists to evaluate their ideas and identify a chosen solution. They are not always appropriate unless they are appropriately qualified. The higher credit is gained when candidates give evaluative comments on their ideas and can make a reasoned judgement on the best solution or features to take forward for further development.

Many candidates reproduced a selected idea from the exploration stage and justified the materials and constructional methods in the development section. A number produced detailed stages of manufacture; which is not required. Candidates are again advised to not include superficial development of features such as ‘round off corners’.

To achieve the higher mark range, candidates must include evidence of their decision making to show the improvements or modifications to their idea(s) leading to a single design proposal.

Most proposed solutions were feasible and well presented.

Most candidates included overall dimensions in their final proposal; for full credit 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, functional details and suggesting further modifications or improvements. Many candidates copy 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

This question was generally well answered with a full range of responses. Some candidates produced outstanding responses; innovative solutions that were exceptionally well presented.

Acceptable specification points included:

- the product must be robust to take the wear and tear of regular use by candidates;
- the product must be adjustable or be able to accommodate different body sizes;
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- the product must be made from materials which can withstand outdoor weather conditions;
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Most candidates produced a wide range of possible solutions, selecting and justifying appropriate materials.

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 poor; few candidates made specific reference to the final proposal and suggested possible improvements.

Question 11

Relatively few candidates attempted this question. Some candidates were able to draw on their mechanical knowledge to propose effective solutions. A significant number of candidates produced outline solutions with little evidence of how they would work. Some interpreted the brief as a step or stair arrangement and were awarded credit where appropriate. The requirement was for a hand held device.

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Constructional and material details were generally poor.

The most successful ideas employed simple mechanisms to produce a basic ‘grab’ arrangement.

Question 12

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

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A number of candidates only considered one material, card. To achieve the higher mark range, different specific types of card and/or other appropriate materials should be considered. The development section was generally poor with very few candidates giving details of appropriate construction methods, particularly when using card.

DESIGN AND TECHNOLOGY

Paper 9705/33
Written 2

General comments

The overall standard of candidate performance was good this year with an increased number of outstanding scripts.

The quality and use of appropriate sketching and annotation continues to be of a very good standard throughout the paper.

Candidates were generally well prepared for this examination and there were very few rubric errors.

Most candidates used their time effectively in both sections of the paper.

Responses to ***Section A*** were generally good although a significant number of candidates produced very brief responses, lacking the detail necessary to achieve middle to high credit ranges.

Questions 3(b), **5(c)** and **8 (c)** include the instruction to 'discuss'. Centres are reminded to make candidates aware of the front page instructions, where guidance on how to respond to the instruction 'discuss' are given.

Responses to ***Section B*** were mostly good. It is clear that candidates are well prepared for this section with virtually all candidates producing full responses.

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

In Part **A**, there was an even spread of responses to **Questions 1**, **2** and **3**.

In Part **B**, there were a number of attempts at **Question 5**.

There was an even spread of attempts to **Questions 7**, **8** and **9** in Part **C**.

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

Comments on specific questions

Section*: *A

Part A – Product Design

Question 1

There was a wide range of responses to this question. Some candidates produced fully detailed descriptions, using clear sketching and annotation, of the key stages of the manufacturing processes chosen, explained their particular suitability for the manufacture of the chosen product and achieved very high credit. Some responses were very brief and lacked sufficient detail to gain middle to high credit.

(a) Vacuum forming was the most popular choice of process with an even number of attempts at describing drilling and boring and edging and veneering. Vacuum forming was described particularly well although some candidates did not include details of the former.

Whilst many candidates correctly described the process of drilling, very few were able to describe the process of boring. Most candidates correctly described the process of veneering but many did not include details of how the table top could be edged.

Some candidates produced fully detailed and lengthy answers; a number described a disproportionate number of stages for the credit awarded.

(b) This part was answered well. Most candidates were able to correctly explain why the relevant process was suitable for the production of the items.

Question 2

(a) Most candidates gave appropriate materials for the door handle component and reasons for suitability. A few candidates incorrectly selected the handle and did not describe the component drawn out in detail in Fig. 2.

Aluminium, brass, chromed steel and ABS were the most popular correct responses.

(b) Most candidates correctly described the drilling and countersinking procedures, a few went on to describe the counter-boring of the Ø36 hole and gained very high credit. The use of annotated sketching was very good on this question.

(c) This part was answered well by most candidates. Most changed the material and gave full details of injection moulding; some accurately described the process of injection die casting to manufacture a batch of 5000.

Question 3

This question was generally well answered.

(a) Most candidates had a good knowledge and understanding of ergonomics and selected four appropriate examples in the design of a mobile phone. Some candidates did not use sketches as requested and consequently could not access higher credit.

(b) Generally well answered. The best responses considered how advances in technology had impacted upon the size and functionality of the product. Some candidates produced very brief responses. Centres are reminded to make candidates aware of the front page instructions, where guidance on how to respond to the instruction 'discuss' are given.

Part B - Practical Technology

Question 4

There were no attempts at this question.

Question 5

(a) Most candidates sketched a mortice and tenon and a dowelled joint as methods of joining the rail to the leg.

(b) Most candidates sketched a simple barrel lock as a suitable knock-down fitting. Very few candidates sketched a second example.

(c) Generally well answered. Candidates raised and explained issues relating to ease of storage and transportation. Most included appropriate examples to support their answer.

Question 6

There were no attempts at this question.

Part C – Graphic Products

Question 7

Most candidates produced good quality planometric views of the barbecue area in a garden. The best responses included the accurate construction of the arch, table and seating areas.

Question 8

Very few candidates attempted this question.

(a) A wide range of appropriate materials were accepted for the mouse mat.

(b) Very few candidates were able to describe an appropriate printing method for a batch of 5000 mouse mats.

(c) There were some excellent responses to this part. Some candidates explained a range of ethical and environmental issues and included appropriate examples to support their answers; achieving very high credit.

Question 9

There were some very good responses to this question.

(a) Most candidates produced a correct development of the printer cartridge package. Accuracy and line quality were generally very good.

(b) A few candidates gave fully detailed descriptions of the die cutting and creasing process. A significant number of candidates did not attempt this part.

Section*: *B

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

Some candidates produced very high quality responses to this section. Presentation skills are generally most impressive with candidates showing the knowledge of appropriate materials and construction techniques.

For most candidates, the analysis, in the form of scatter-charts or lists, was focused on the requirements of the given problem. A number of candidates copied out the question or rewrote the problem; this is unnecessary.

Some candidates produce generic charts that have no specific reference to the problem.

This analysis should then lead to justified specification points. Single word or generic statements, with no reference to the product will not gain credit.

The majority of candidates produced a range of at least three discrete and different design ideas, many including the exploration of sub-problems, e.g. a range of methods of adjusting the angle of the work surface for **Question 10**.

Most candidates made good reference to appropriate specific materials, giving justifications for their use. It is recommended that candidates show their understanding of the appropriate use of a wider range (at least three) of appropriate materials.

A number of candidates employed tick lists to evaluate their ideas and identify a chosen solution. They are not always appropriate unless they are appropriately qualified. Higher credit is achieved when candidates give evaluative comments on ideas and can make a reasoned judgment on the best solution or features to take forward for further development.

The development of the idea/s to a final solution is generally good although a significant number of candidates produce detailed descriptions of the stages of manufacture of the product. Candidates need to show how their idea/s has been developed in terms of effectiveness, material choice and methods of construction/assembly.

Candidates who used annotated sketches to clearly show their reasoning behind decisions had access to the full range of credit.

Candidates are advised to not include the superficial development of features such as 'round off corners'.

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 credit candidates need to give more detailed dimensions such as the section or thickness of materials used. For full credit in the detail section, candidates would be expected to include dimensions, materials and possible finishes.

Some candidates described successful and unsuccessful elements of their design proposal and gave details of improvements or modifications and consequently achieved very high credit.

Question 10

This was the most popular question, generally well answered.

Acceptable specification points included:

- the product must be easily operated by a single person;
- the product must have a work surface that can be easily cleaned as it may be used for other functions;
- the product must be adjustable to be able to be used comfortably by candidates of different ages/sizes;
- the product must be secure when assembled so as not to cause instability or health risk.

Most candidates generated a wide range of design ideas, some presented creative and innovative solutions. Many responses had flowing design thinking; candidates were considering a range of possibilities for each of their specification points.

Most final proposals were realistic, drawn in detail including materials, dimensions and finishes.

Question 11

Relatively few candidates attempted this question. Candidates who had a good knowledge and understanding of electrical systems and sensors produced realistic and detailed solutions. A number of candidates attempted this question without any electronic experience and produced very simplistic proposals with little or no relevant detail.

Acceptable specification points included:

- the product must be of a suitable size so as not to form an obstruction on the driveway;
- the product must be constructed from materials appropriate for an external environment;
- the product must have secure access so that repairs could be carried out by qualified personnel and not cause danger to the general public;
- the product must be designed to support/reflect the Schools image, e.g. shapes/colours.

Question 12

There was a wide range of responses to this question. Most candidates correctly designed a model of the study area and considered appropriate materials and construction techniques. A small number of candidates produced 2D solutions and did not access the full range of credit.

Acceptable specification points included:

- the model must include moveable equipment/facilities to propose different arrangements;
- the work areas should be close to windows to make best use of natural light;

- the area should be divided into three zones, computing, reading and desk based activities;
- the work areas should not be close to the doors so that candidates are not disturbed when the doors are opened.

Many responses were outstanding; candidates demonstrated an excellent understanding and awareness of the effective use of space and ergonomic requirements. They were able to show good quality modelling techniques, using simple constructions and use of available rendered modelling materials.

DESIGN AND TECHNOLOGY

Paper 9705/04

Project 2

Key Messages

- Candidates are advised not to spend time researching materials, construction methods, fittings and finishes as part of the analysis of and research into the design brief, as this cannot be awarded credit in this section of the assessment scheme. Data collected should relate to the design problem, not any anticipated product outcome.
- Coursework submissions that combine Project 1 and Project 2 in an integrated way should offer clear evidence that some form of modelling has been produced for Project 1 and a final product for Project 2. The design folder should include clear photographic evidence of both these pieces of practical work.

General comments

Centres are encouraged to use an approach that is appropriate to their own situation when introducing this important part of the Design and Technology course to their candidates, so long as evidence can be produced that matches the requirements of the assessment scheme. Some set a common theme or topic to which candidates respond in their own way, while others encourage their candidates to identify their own design problem which may be derived from hobbies, interests or life at home or in the community. In any event, outcomes resulted from a wide variety of design problems and it was obvious that many candidates had developed a keen interest in the area being studied.

In addition to the usual range of household items, interesting outcomes of either modelling or final products included a vegetable sieve, shopping trolley, herb storage, tool trolley, aids for disabled, sports memorabilia display, art studio equipment, cooker for rural areas, artificial fishing bait, greenhouse, towel drier, child's slide, camping storage unit, off-road trailer, school locker, dog basket, pool chair, tollgate booth, cycle trailer, bicycle stand, folding coat hanger, chicken coop, surf board, recycle bin, solar speaker backpack, drinks warmer, newspaper storage system, pencil sharpener, street lighting, alternative fuel model car, starting blocks, scoreboard, metal press, solar turbine, exercise machine, model catamaran and railway crossing gates. Several projects resulted in well made architectural models, the appropriateness and standard of which have improved as more experience has been gained in this approach to Design and Technology.

It was pleasing to see that many Centres had encouraged their candidates to present design folders neatly and in such a way that the design process could be followed easily.

Comments on Specific Assessment Criteria

5. Product development

Successful candidates took the final design idea(s) from Project 1 and then considered all aspects of form, materials, components, constructions, finish and production methods in detail. All information was linked to the chosen idea and where alternatives had been considered, and choices made, reasons for these were given.

This section of the assessment scheme also requires candidates to carry out some form of testing. This can be of materials, constructions, form, etc. but it should be obvious how this links to the design idea being developed. Candidates need to include written or photographic evidence that this has been carried out.

In some projects, it is not always clear why selections have been made and there is often a big gap between the chosen design idea and the final product. Once these decisions have been made, the final part of the

development should include details of the final solution, mainly in the form of drawings, from which a skilled person could make the product.

6. Product planning

Most candidates set out the sequence for the main stages of production, often produced in flow chart or tabular form linked to some form of time plan. There is no requirement for candidates to show how basic techniques will be carried out, but many candidates included details of the more complex methods of manufacture.

Candidates are not required to include lengthy photographic evidence of all stages of manufacture, although some photographs can be helpful when highlighting certain aspects of the manufacturing process.

7. Product realisation

It is always pleasing to see how many candidates have produced high quality products that could clearly be put to their intended use. Candidates should be congratulated on the care and enthusiasm put into the making of their design outcomes in terms of construction methods and finishing techniques, and it is reassuring to see that there are still many well developed practical skills being applied.

Centres are reminded of the need to include clear and detailed photographic evidence of made products, in line with the guidance set out in the syllabus document.

8. Testing and evaluation

It was pleasing to see that there continues to be an improvement in the number of candidates carrying out meaningful testing and evaluation. This can only be achieved if the product is put to the use intended and the results compared to the original design brief and specification. It is always helpful, and of interest to the Moderator, when candidates include photographs of the product being used and tested in this way.

The completion of questionnaires and the recording of the views of others are only of use where the results can be compared to the intended use of the product and some form of qualified judgement is made and recorded.