

DESIGN AND TECHNOLOGY

Paper 9705/11 Written 1
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Key messages

Centres are advised to ensure that the specification receives full coverage through the scheme of work to ensure that candidates are fully familiar with the requirements of the syllabus.

Section B (d) analysis questions were often very well attempted but candidates did not always include relevant examples to evidence their understanding.

General comments

In **Sections A** and **B**, candidates were generally well prepared and all questions were accessible. Process knowledge was generally good with all three questions in **Section A** being attempted with a clear understanding of the basic knowledge. Candidates usually found the three questions in **Section C** accessible with some excellent answers.

It is important that candidates clearly understand what is required by the terms 'develop' and 'range'. Candidates also need to recognise where they need to offer several different ideas in response to questions, which they then evaluate to allow further development into a final proposal for each part of the question. Components, mechanisms and construction techniques were particularly well detailed in many responses.

Evaluation of candidate's initial ideas was often limited in detail and sometimes did not include any of the aspects that were very clearly requested in the question. e.g. 'taking the frame apart easily for storage'.

Comments on specific questions

Section A

Question 1

- (a) This question was generally well answered with cardboard and polypropylene being popular responses. Occasionally very resistant materials were suggested that would not fold neatly within the given design.
- (b)(i) Stronger answers clearly detailed the marking out, cutting out and assembly in this question. Many candidates did not use technical terms for the tools and equipment that were used. Safety precautions were not always included.
- (ii) Modifications were generally good with the majority of candidates also folding their idea flat too. However, details of tools, equipment and safety precautions were not always included.
- (iii) Most candidates understood that by taking the time to manufacture jigs/templates that accuracy would be improved, and time would be saved when a batch of photo frames or other similar products were manufactured.

Question 2

- (a) Most candidates were able to name a suitable material with aluminium tube often given as an answer.

- (b)(i) Answers to this question often included a significant amount of detail with processes well explained. There was a good awareness of safety precautions when tools/equipment or machinery were involved. Some candidates just focused on joining the parts together rather than making part **A** first.
- (ii) Candidates demonstrated a good knowledge of ergonomics and often showed very clearly how the handle could be improved in terms of the interactions with the user. Shape and additional grip were well detailed. However, some candidates did not show how the modifications would be undertaken in terms of tools, equipment and processes.
- (c) This question was often well answered, with ease of manufacturing complex shapes, costs savings, repeatability for batch production and consistent finish for plastic products all seen in good responses.

Question 3

- (a) This question was usually answered well with mild steel, stainless steel and aluminium all popular materials given.
- (b)(i) Significant amounts of detail were included in many responses with processes well explained. There was a good awareness of safety precautions. Many candidates used a jig to form part **B** but did not offer any suggestions on how the angle would be accurately measured or held in place to avoid creep when cooling.
- (ii) There were many good answers here, with good use of marking out, cutting out slots in tubes and welding.
- (iii) This question was generally answered very well with some outstanding diagrams showing how the product could become modular.

Section B

Question 4

- (a) Candidates often answered fully correctly and clearly understood the function of part **X**.
- (b) Many candidates answered this question correctly and identified the problems with the design of the wall mounted letterbox.
- (c) This question required both notes and sketches, but many candidates did not follow this instruction. Some candidates just used diagrams, which unfortunately did not fully explain the problems identified in (b). Those candidates who correctly identified problems and subsequently followed the instructions gave some excellent, fully detailed answers.
- (d) Candidates often described three relevant issues but then did not explain them fully. Specific examples/evidence were rarely used to support conclusions. Where examples/evidence were used, they were generally well linked.

Question 5

- (a) Most candidates answered this question accurately.
- (b) This question was generally answered well. Problems identified and clearly explained were often the lids not being correctly designed to close properly or the lack of support/glue tabs on the vertical end sections.
- (c) This question required both notes and sketches, but many candidates did not follow this instruction. Some candidates just used diagrams, which unfortunately did not fully explain the problems identified in (b). Those candidates who correctly identified problems and subsequently followed the instructions gave some excellent, fully detailed answers.
- (d) Candidates focused on the cost saving for manufacturers as no assembly of the product is necessary. This included saving space in storage and transportation as well as costs related to this

and also the fact that transporting products two-dimensionally is likely to reduce the risks of damage to a fragile material/shape. Explanations were mostly clear, but examples were rarely included.

Question 6

- (a) Whilst terminology was not always clear, candidates were able to demonstrate a full understanding of what part **X** was and its function.
- (b) This question was very well answered with problems such as no lifting arm for the table, on/off switches missing and no clamps for the frame all being regularly given.
- (c) Candidates who answered question (b) well, found this question straightforward. Some diagrams were difficult to understand but when used effectively, they really enhanced the answers.
- (d) Where candidates understood how moulds are used in vacuum forming, they were able to describe three relevant issues and explained them fully. Ease of machining and the higher melting points of aluminium and MDF were often given in answers. However, specific examples/evidence were rarely used to support conclusions.

Section C

Question 7

- (a) Most well-structured answers showed a range of ideas with sensible seats with back rests and support for the children mentioned but occasionally there was limited development. In stronger answers some very good structural and technical detail was also added. A final solution was generally identified and good detail was provided. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) There was a range of responses to this question with some innovative ideas on how the see-saw could pivot and have the stability required to remain sturdy when in use.
- (c) This question was generally well answered, with the distance of handles from the seat taken being considered as well as grip and comfort for children's hands.
- (d) Candidates usually answered this question well. A variety of rendering styles and quality was suggested. However, some candidates did not apply any render at all. There were some outstanding responses, with many having superb three-dimensional drawings.

Question 8

- (a) Candidates produced a range of ideas for the design of the frame to support the plywood boarding. Three ideas were regularly produced with some candidates showing development. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) A variety of different ideas was suggested in answers to this question. Innovative ideas included the use of flexible materials that would act as safety rails, such as chains and strong fabric straps. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (c) This question was very well answered in many cases with some imaginative ways of adjusting the canopy to different angles.
- (d) Candidates usually answered this question well. A variety of rendering styles and quality was suggested. However, some candidates did not apply any render at all. There were some outstanding responses, with many having superb three-dimensional drawings.

Question 9

- (a) This question was often very well answered. Most candidates produced a range of ideas for viable solutions. Three ideas were regularly produced with some candidates showing very good development. Stronger responses also clearly detailed how the straps would be joined without the use of a fixative. Some candidates added glue which was not within the question. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) There were many good answers to this question detailing innovative ideas for the lettering and colour schemes. Colourful graphics added to the overall feel of the answers and were suitable for the context. Some answers were outstanding and captured the idea of the question perfectly.
- (c) Many outstanding answers showed a great deal of imagination to communicate graphical information with symbols rather than words.
- (d) Candidates usually answered this question well. A variety of rendering styles and quality was suggested. However, some candidates did not apply any render at all. There were some outstanding responses, with many having superb three-dimensional drawings. However, some candidates found the 3D shape of the flower basket difficult to draw. In other cases, there was evidence of some superb three-dimensional drawings.

DESIGN AND TECHNOLOGY

Paper 9705/12 Written 1
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Key messages

Centres are advised to ensure that the specification receives full coverage through the scheme of work to ensure that candidates are fully familiar with the requirements of the syllabus.

Section B (d) analysis questions were often very well attempted but candidates did not always include relevant examples to evidence their understanding.

General comments

In **Sections A** and **B**, candidates were generally well prepared and all questions were accessible. Process knowledge was generally good with all three questions in **Section A** being attempted with a clear understanding of the basic knowledge. Candidates usually found the three questions in **Section C** accessible and there were some excellent answers.

It is important that candidates clearly understand what is required by the terms 'develop' and 'range'. Candidates also need to recognise where they need to offer several different ideas in response to questions, which they then evaluate to allow further development into a final proposal for each part of the question. Components, mechanisms and construction techniques were particularly well detailed in many responses.

Evaluation of candidates' initial ideas was often limited in detail and sometimes did not include any of the aspects that were very clearly requested in the question. e.g. 'taking the frame apart easily for storage'.

Comments on specific questions

Section A

Question 1

- (a) This question was generally well answered and most candidates achieved at least partial credit.
- (b)(i) Stronger answers clearly detailed the marking out, cutting out and finishing. Many candidates did not use technical terms for the tools and equipment that were being used. Safety precautions were not always included.
- (ii) When candidates had a good understanding of knock-down fittings, some outstanding answers were seen. Modesty blocks were very popular. However, details on tools, equipment and safety precautions were not always included.
- (iii) Most candidates understood the basics of applying a decorative finish. However, many candidates offered answers that did not include the preparation of the surfaces or the need for care when applying a finish.

Question 2

- (a) Most candidates were able to give two reasons, with card allowing for easy further modifications often given as an answer.
- (b) There were some very good responses to this question, with proportion and shape detailed well.

- (c) (i) Stronger candidates clearly detailed the marking out and cutting out. Many candidates did not use technical terms for the tools and equipment that were being used. Safety precautions were not always included.
- (ii) There were some good answers to this question, but many candidates did not include details of how the prototype could be strengthened. Stronger answers added ribs, webs and thicker sections of card. Some candidates did not show how the modifications would be undertaken in terms of tools, equipment and processes used which limited their answers.

Question 3

- (a) This question was generally well attempted with stable material and no need for a finish to be added being answers often given.
- (b) (i) Answers often included a significant amount of detail, with processes well explained. There was a good awareness of safety precautions shown.
- (ii) There were many strong responses to this question with candidates showing good use of marking out, cutting out the holders and the use of the line bender to aid bending of the acrylic. Tools, equipment and processes were generally well covered.
- (c) Colour and surface designs were often suggested as changes that could improve the aesthetic appeal of the magazine rack but often answers were not detailed enough and did not really enhance the product at all.

Section B

Question 4

- (a) Candidates often answered this question very well and clearly understood the function of part **X**.
- (b) Many candidates answered this part correctly and identified the problems with the design of the child's slide.
- (c) This question clearly required both notes and sketches. Some candidates did not always follow this instruction. Some candidates just used diagrams, which unfortunately did not fully explain the problems identified in **(b)**. Those candidates who had correctly identified problems and subsequently followed the instructions gave some excellent fully detailed answers that could be awarded full credit.
- (d) Candidates rarely described three relevant issues regarding the use of non-destructive testing. Specific examples/evidence were rarely used to support conclusions. Where examples/evidence were used they were generally well linked.

Question 5

- (a) Most candidates understood the function of part **X**.
- (b) This question was generally answered well. The problems identified and clearly explained were often the missing fold lines and glue tabs on the side panels.
- (c) This question required both notes and sketches. However, some candidates did not always follow this instruction. Some candidates just used diagrams, which unfortunately did not fully explain the problems identified in **(b)**. Those candidates who had correctly identified problems and subsequently followed the instructions gave some excellent fully detailed answers that could be awarded full credit.
- (d) This question was very well answered, with many very good examples given. Candidates often focused on the use of colour to attract customers as well as the use of colour to demonstrate a product. In this case they used greens to support healthy food and living.

Question 6

- (a) Candidates usually demonstrated a full understanding of what part **X** was and its function.
- (b) This question was answered very well with problems such as no on/off switch, poorly designed handle and no instructions on the product given.
- (c) Candidates who answered (b) well, found this question straightforward. Some diagrams were difficult to understand but when used effectively, they really enhanced the answers.
- (d) Where candidates understood the reasons and need to be energy efficient, they answered very well. However, specific examples/evidence were rarely used to support conclusions.

Section C

Question 7

- (a) Most well-structured answers showed a range of ideas that allowed the play house to easily collapse for storage, but there was occasionally limited development. Some very good structural and technical detail was often also added. A final solution was generally identified and good detail was provided. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) There was a range of responses to this question with some good ideas for doors, handles and hinging that would allow children to open the door with ease. Occasionally answers were very similar in outcome and did not offer an easy way to open and close the door.
- (c) This question was very well answered.
- (d) This question was generally well answered and a variety of rendering styles and quality were given. However, some candidates did not apply any render at all. There were also some outstanding responses with some superb three-dimensional drawings.

Question 8

- (a) Candidates produced a range of ideas for the design of a display stand, ranging from sensible and easy to collapse and store, to very large items that would not be easy to collapse at all. Three ideas were regularly produced with some candidates showing development. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) There were some good answers to this question detailing innovative ideas for the lettering and imagery. Colourful graphics added to the overall feel of the answers and were suitable for the context.
- (c) This question was very well answered with many different ideas for a menu holder given.
- (d) This question was usually answered well and there was a variety of rendering styles and quality. However, some candidates did not apply any render at all. There were some outstanding responses with many having superb three-dimensional drawings.

Question 9

- (a) This part was generally well answered. Most candidates produced a range of ideas for viable solutions. Three ideas were regularly produced with some candidates showing very good development. Good responses also clearly detailed how the flipchart stand could easily be moved around a school. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) A range of responses was seen here with stronger candidates detailing imaginative and sensible ways to hold marker pens on the flipchart stand.
- (c) A very wide range of answers was seen. Some were completely sensible and would allow easy removal of the flipchart pad, but others did not include this aspect in their answer.

- (d) This question produced many outstanding responses with a variety of rendering styles. Unfortunately, some candidates did not apply any render at all. There was evidence of some superb three-dimensional drawings.

DESIGN AND TECHNOLOGY

Paper 9705/13 Written 1
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Key messages

Centres are advised to ensure that the specification receives full coverage through the scheme of work to ensure that candidates are fully familiar with the requirements of the syllabus.

Section B (d) analysis questions were often very well attempted but candidates did not always include relevant examples to evidence their understanding.

General comments

In **Sections A** and **B**, candidates were generally well prepared and all questions were accessible. Process knowledge was generally good with all three questions in **Section A** being attempted with a clear understanding of the basic knowledge. Candidates usually found the three questions in **Section C** accessible with some excellent answers.

It is important that candidates clearly understand what is required by the terms 'develop' and 'range'. Candidates also need to recognise where they need to offer several different ideas in response to questions, which they then evaluate to allow further development into a final proposal for each part of the question. Components, mechanisms and construction techniques were particularly well detailed in many responses.

Evaluation of candidate's initial ideas was often limited in detail and sometimes did not include any of the aspects that were very clearly requested in the question. e.g. 'taking the frame apart easily for storage'.

Comments on specific questions

Section A

Question 1

- (a) This question was generally well answered with cardboard and polypropylene being popular responses. Occasionally very resistant materials were suggested that would not fold neatly within the given design.
- (b)(i) Stronger answers clearly detailed the marking out, cutting out and assembly in this question. Many candidates did not use technical terms for the tools and equipment that were used. Safety precautions were not always included.
- (ii) Modifications were generally good with the majority of candidates also folding their idea flat too. However, details of tools, equipment and safety precautions were not always included.
- (iii) Most candidates understood that by taking the time to manufacture jigs/templates that accuracy would be improved, and time would be saved when a batch of photo frames or other similar products were manufactured.

Question 2

- (a) Most candidates were able to name a suitable material with aluminium tube often given as an answer.

- (b)(i) Answers to this question often included a significant amount of detail with processes well explained. There was a good awareness of safety precautions when tools/equipment or machinery were involved. Some candidates just focused on joining the parts together rather than making part **A** first.
- (ii) Candidates demonstrated a good knowledge of ergonomics and often showed very clearly how the handle could be improved in terms of the interactions with the user. Shape and additional grip were well detailed. However, some candidates did not show how the modifications would be undertaken in terms of tools, equipment and processes.
- (c) This question was often well answered, with ease of manufacturing complex shapes, costs savings, repeatability for batch production and consistent finish for plastic products all seen in good responses.

Question 3

- (a) This question was usually answered well with mild steel, stainless steel and aluminium all popular materials given.
- (b)(i) Significant amounts of detail were included in many responses with processes well explained. There was a good awareness of safety precautions. Many candidates used a jig to form part **B** but did not offer any suggestions on how the angle would be accurately measured or held in place to avoid creep when cooling.
- (ii) There were many good answers here, with good use of marking out, cutting out slots in tubes and welding.
- (iii) This question was generally answered very well with some outstanding diagrams showing how the product could become modular.

Section B

Question 4

- (a) Candidates often answered fully correctly and clearly understood the function of part **X**.
- (b) Many candidates answered this question correctly and identified the problems with the design of the wall mounted letterbox.
- (c) This question required both notes and sketches, but many candidates did not follow this instruction. Some candidates just used diagrams, which unfortunately did not fully explain the problems identified in (b). Those candidates who correctly identified problems and subsequently followed the instructions gave some excellent, fully detailed answers.
- (d) Candidates often described three relevant issues but then did not explain them fully. Specific examples/evidence were rarely used to support conclusions. Where examples/evidence were used, they were generally well linked.

Question 5

- (a) Most candidates answered this question accurately.
- (b) This question was generally answered well. Problems identified and clearly explained were often the lids not being correctly designed to close properly or the lack of support/glue tabs on the vertical end sections.
- (c) This question required both notes and sketches, but many candidates did not follow this instruction. Some candidates just used diagrams, which unfortunately did not fully explain the problems identified in (b). Those candidates who correctly identified problems and subsequently followed the instructions gave some excellent, fully detailed answers.
- (d) Candidates focused on the cost saving for manufacturers as no assembly of the product is necessary. This included saving space in storage and transportation as well as costs related to this

and also the fact that transporting products two-dimensionally is likely to reduce the risks of damage to a fragile material/shape. Explanations were mostly clear, but examples were rarely included.

Question 6

- (a) Whilst terminology was not always clear, candidates were able to demonstrate a full understanding of what part **X** was and its function.
- (b) This question was very well answered with problems such as no lifting arm for the table, on/off switches missing and no clamps for the frame all being regularly given.
- (c) Candidates who answered question (b) well, found this question straightforward. Some diagrams were difficult to understand but when used effectively, they really enhanced the answers.
- (d) Where candidates understood how moulds are used in vacuum forming, they were able to describe three relevant issues and explained them fully. Ease of machining and the higher melting points of aluminium and MDF were often given in answers. However, specific examples/evidence were rarely used to support conclusions.

Section C

Question 7

- (a) Most well-structured answers showed a range of ideas with sensible seats with back rests and support for the children mentioned but occasionally there was limited development. In stronger answers some very good structural and technical detail was also added. A final solution was generally identified and good detail was provided. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) There was a range of responses to this question with some innovative ideas on how the see-saw could pivot and have the stability required to remain sturdy when in use.
- (c) This question was generally well answered, with the distance of handles from the seat taken being considered as well as grip and comfort for children's hands.
- (d) Candidates usually answered this question well. A variety of rendering styles and quality was suggested. However, some candidates did not apply any render at all. There were some outstanding responses, with many having superb three-dimensional drawings.

Question 8

- (a) Candidates produced a range of ideas for the design of the frame to support the plywood boarding. Three ideas were regularly produced with some candidates showing development. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) A variety of different ideas was suggested in answers to this question. Innovative ideas included the use of flexible materials that would act as safety rails, such as chains and strong fabric straps. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (c) This question was very well answered in many cases with some imaginative ways of adjusting the canopy to different angles.
- (d) Candidates usually answered this question well. A variety of rendering styles and quality was suggested. However, some candidates did not apply any render at all. There were some outstanding responses, with many having superb three-dimensional drawings.

Question 9

- (a) This question was often very well answered. Most candidates produced a range of ideas for viable solutions. Three ideas were regularly produced with some candidates showing very good development. Stronger responses also clearly detailed how the straps would be joined without the use of a fixative. Some candidates added glue which was not within the question. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) There were many good answers to this question detailing innovative ideas for the lettering and colour schemes. Colourful graphics added to the overall feel of the answers and were suitable for the context. Some answers were outstanding and captured the idea of the question perfectly.
- (c) Many outstanding answers showed a great deal of imagination to communicate graphical information with symbols rather than words.
- (d) Candidates usually answered this question well. A variety of rendering styles and quality was suggested. However, some candidates did not apply any render at all. There were some outstanding responses, with many having superb three-dimensional drawings. However, some candidates found the 3D shape of the flower basket difficult to draw. In other cases, there was evidence of some superb three-dimensional drawings.

DESIGN AND TECHNOLOGY

Paper 9705/02 Project 1
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Key messages

- Candidates are advised to focus on their design need and brief throughout the analysis and research stages of the project rather than on any preconceived idea of an outcome. The product specification should evolve from this analysis and research so that it can be referred to throughout the generation and development of Ideas.
- It is important that candidates understand fully the requirements of the Product Development criterion. This is a substantial and important stage in the development of the selected design idea and should be presented as evidence of practical design thinking rather than a collection of information on materials, constructions, finishes and other items, as was often the case.

General comments

The school-based assessment for this syllabus can be offered either as two discrete components, Project 1 and Project 2, or as one larger piece of work combining the two projects in a holistic way. This report identifies each of the components separately but also acknowledges the overall design process where the two are combined.

Centres introduce this important part of the Design and Technology course to their candidates in slightly different ways but it is important that evidence produced matches the requirements of the assessment criteria. Some centres set a common theme or topic to which candidates respond in their own way while others encourage each candidate to identify their own design problem which may be derived from hobbies, interests or life at home and in the community.

Outcomes were produced 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 or architectural models, there were a number of interesting outcomes of either modelling or final products. Examples of these outcomes included: modular tool guide, pet water station, paintbrush cleaner, waste water collection, shuttlecock holder, tape dispenser, multi-functional workbench, chocolate display box, headset stand, drawing desk, garden swing, chicken egg incubator, phone storage unit with charger, projector stand, multi-gadget holding device, cycle weather guard, airboat, drone, camping chair, keychain organiser, sun glasses, pizza cutter, trumpet storage, cable management, door flood barrier, floating waste collector, medicine organiser, artist's easel, go kart, bike and kayak trailer and basketball trophy.

Centres are reminded of the requirement to include detailed photographic evidence of the model for Project 1 and the final realised product for Project 2.

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 intended design route being followed.

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

It is essential that there is a thorough analysis of the actual design problem being undertaken 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. Most candidates considered a wide range of existing products and commented on these in relation to their own design brief. Specifications were generally well formulated and included many specific requirements of the product to be designed.

3 Generation and Appraisal of Design Ideas

Many candidates showed a high degree of flair in the creation of ideas. However, a few candidates presented a range of drawings not linked to the specification or and did not comment on their possible suitability for the problem being considered. In these cases, it is not really possible to award marks above the lowest band set out in the assessment criteria.

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

A good range and high standard of communication techniques was used in the presentation of design proposals. This allowed candidates to demonstrate how their thought process had 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, perhaps in Project 2. 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. In these cases, it was sometimes difficult to identify how it made a contribution to the design process.

A number of candidates modelled different aspects of their design ideas and used these to test for suitability and practicality in the production of a complete solution to their design problem. In this way, the modelling stage played a meaningful part in designing.

DESIGN AND TECHNOLOGY

Paper 9705/32 Written 2
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Key messages

- Candidates should be reminded to read each question carefully. Some candidates could not access the full mark range by missing out key requirements of the question, particularly in **Section B**.
- Some responses to questions requiring the candidate to 'discuss' were very brief and raised very few relevant issues. Candidates may find it useful to produce a brief plan of the issues to include. More specific supporting examples and evidence would have helped candidates to access the higher mark ranges.

General comments

Most candidates followed the rubric correctly and appeared to have completed the question paper within the time allowed.

Sketching and annotation was good in **Section A** and the presentation of design work in **Section B** was generally also of a very good standard. There were some outstanding responses in **Section B** where candidates produced a good range of creative ideas and good design thinking was clearly evident at every stage.

Comments on specific questions

Section A

Part A – Product Design

Question 1

- (a) Most candidates selected an appropriate material for the storage box and gave valid reasons for their choice. Some candidates did not take into account that the box was to contain metal components.
- (b) Most candidates answered this part quite well. Most described the key stages of production and made good use of notes and sketches to include appropriate detail. Some candidates did not take into consideration that the instruction was '...how you would make one storage box' and described an inappropriate method.

The strongest responses used three or four well annotated sketches of the key stages of manufacture to support a detailed description of the sequence of manufacture.

- (c) There were some very good responses to this part where candidates suggested slight design changes, often a change in material and described the use of templates and jigs to manufacture a small batch.

Some candidates selected injection moulding as the manufacturing method which would be inappropriate for a batch of 100.

Question 2

There were some excellent responses to this question which were structured, well written and focused on appropriate issues regarding the implications of new technologies and trends for consumers and manufacturers. Valid examples were used as evidence to support answers.

Some weaker responses were not well structured and were presented as a list of bullet points, which did not meet the requirements of the question 'to discuss'.

Question 3

Laminating and brazing were the most popular responses. Annotated sketches were used well on this question.

- (a) Most candidates demonstrated a clear knowledge and understanding of the lamination of the chair back. Some candidates described a process of applying a laminated polymer cover to the chair back and were awarded partial credit where a feasible method was applied. The process of brazing was fully described by most candidates. Those candidates who chose to describe calendaring produced fully detailed descriptions.
- (b) The majority of candidates correctly explained why the process was suitable for the production of the items. Most candidates explained the suitability of the process in detail and produced very full responses. Some candidates produced single word responses which limited the credit that could be awarded.

Part B – Practical Technology

Question 4

Not all parts of this question were fully completed by some candidates.

- (a) Hardness and stiffness were defined correctly, and appropriate materials stated by some candidates.
- (b) The strongest responses described a method of supporting the sample, applying a bending force and included a method of measuring the results.
- (c) Some candidates made reference to specific performance data and health and safety issues in their response. Attempts to this part were generally brief or lacking appropriate detail.
- (d) There were few attempts at this question. The responses were generally brief, but some candidates made reference to data regarding the strength of materials for appropriate application in products.

Question 5

There were no attempts at this question.

Question 6

- (a) Most candidates used sketches and notes well to describe some features of a cam, crank and ratchet but not all gave an appropriate application.
- (b) Some candidates gave correct examples of the use of a hydraulic and a pneumatic system in a vehicle and explained why each system was suitable for the application.

Part C – Graphic Products

Question 7

There were a number of very good responses to this question. Almost all candidates produced an isometric view of the elliptical basket to the correct scale.

Not all candidates constructed the ellipse. Many used a freehand sketch and could not access full marks. Similarly, not all candidates constructed the curve to enable an accurate representation on the isometric view.

Line quality was generally of a very good standard.

Question 8

There were very few attempts at this question. Some candidates used sketches and notes well to describe mechanical and electronic methods of producing graphic images. Screen printing was a common correct response for a mechanical method and some candidates correctly described using a drawing board and equipment. Photocopying and digital printing were accurately described as electronic methods.

Question 9

- (a) Most candidates correctly stated a suitable material for the box and the foam chips.
- (b) The strongest responses included a sequence of correct stages for manufacturing 5000 boxes, including a detailed drawing of the development/net and methods of cutting using a die cutter and folding. Some responses were very brief and lacked sufficient detail to access the higher mark ranges.

Section B

Most candidates fully completed most or all of the requirements in **Section B**. However, a few candidates did not fully complete the final proposal and evaluation sections.

Candidates generally started **Section B** well. Many candidates prepared an analysis of the given situation and wrote a detailed specification. However, some candidates produced a generic scatter chart with limited or no reference to the situation.

Candidates should consider the key issues related to the given problem/situation. This will help them to develop a detailed written specification to guide their design thinking and will also provide a check when designing and evaluating.

The exploration of ideas was generally good with many candidates producing a range of possible solutions. Not all candidates give an on-going evaluation of their ideas to help when selecting ideas and features to take forward for development. Tick charts must be supported with specific evaluative comment.

Most candidates produced a clear development of their ideas into a single design proposal. Some candidates focused solely on manufacturing only, showing limited or no evidence of the reasoning and design decision making.

The majority of proposed solutions were well presented and most candidates included key details such as important features, key dimensions and the materials selected.

Some candidates presented details of the strengths and weaknesses of their proposal and suggested improvements. A considerable number of candidates produced a tick chart against a brief and generic copy of the specification. Specific evaluative comment on the proposal is required fully answer the question.

Question 10

Most candidates produced a range of ideas for a music stand to be used on a desk and comply with the requirements stated. However, some candidates misinterpreted the requirement and designed a freestanding music stand. Most candidates suggested ideas that were feasible and there was some evidence of originality and creativity, particularly in methods of holding the sheet music and adapting the design to suit different users.

Acceptable specification points included:

- the music sheets must be held securely and be easy to turn over;
- the music stand must be stable to ensure that it does wobble or topple;

- the music stand should have pads on the feet, or a method of preventing the stand from sliding on a desk top;
- the music stand should be easy and quick to disassemble for storage.

Most candidates considered appropriate material options and constructional detail was very impressive from a significant number of candidates.

Final proposals were generally realistic and functional with most candidates including details of important dimensions.

Question 11

There were a number of excellent responses to this question. Most candidates produced ideas for an easily transported product that could securely hold the bag to collect litter. Many of the ideas presented focused on a functional transportation product, mostly in the form of a wheeled trolley, and included clear detail of the methods of securing and removing the bag. Several candidates included methods of manoeuvring the product up and down stairs. Technical detail of the mechanisms and construction methods was generally very good.

Acceptable specification points included:

- the product should have an adjustable handle to suit the heights of different users;
- the product should have a fairly wide wheelbase to prevent toppling;
- the product should have a simple and quick operating clip method to hold the bag open to insert litter;
- the product should be finished to cope with outdoor weather conditions and to enable regular cleaning.

Question 12

Most candidates produced designs for a desk organizer and for the logo for Star+. The strongest responses explored a wide range of exciting, creative possibilities for both aspects. A small number of candidates did not consider the requirement to be 'flat pack' for postage and consequently could not access the full range of marks.

Acceptable specification points included:

- the desk organiser should be compact enough to fit onto a candidates desk or shelf and contain items that need to be easily and regularly accessed;
- the desk organizer should be easy to assemble without instructions;
- the desk organizer should have a sufficient number of separate sections to contain the most often used items;
- the logo must be clearly recognizable and suggest top quality art and graphics.

Some candidates produced interesting and effective methods of creating the 'flat pack'. A significant number of candidates gave no indication in their designing or development sections of how the desk organizer would be constructed. Most candidates stated card as their choice of material with no indication of its type or specification.

Some candidates produced a flowing design process covering each requirement in an integrated design manner, while others separated out the design of the organizer and the logo. Each method was successful and allowed access to the full mark range.

DESIGN AND TECHNOLOGY

Paper 9705/33 Written 2
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Key messages

- In **Section A**, some candidates focused on one aspect of manufacture at the expense of showing the key stages when describing a process. For example, some candidates spent the majority of their time detailing the marking out of a tenon joint and did not include how the tenon or mortice were cut.
- In the analysis part of **Section B**, some candidates repeated the information given in the question with no further extension. This results in no marks awarded and specifications are often limited. Candidates must produce an analysis of the problem considering all factors required to prepare a specification and commence designing.
- When developing a design in **Section B**, candidates should ensure that they show the reasoning and design decision making towards the single design proposal, not just a method of manufacture.

General comments

There were many very high-quality answers to questions this year and some candidates exhibited outstanding design skills in **Section B**. The vast majority of candidates followed the rubric correctly and made full attempts at their chosen questions.

Many candidates made excellent use of sketches and notes to describe the stages of processes and supported their answers to questions in **Section A** well. Some candidates focused too heavily on one aspect of the process and could not access the full mark range.

Questions requiring the candidate to 'discuss' were mostly full and detailed. However, there were some very brief responses, and, in some cases, answers were written using bullet points which is an inappropriate way to present a response to a discuss question.

In **Section B**, candidates should be reminded to focus on their analysis of the design situation and not copy out the given details. Specifications were often presented as generic statements or a single word. They needed to be clear and should have stated the main functions and qualities of the product.

Comments on specific questions

Section A

Part A – Product Design

Question 1

- (a) Candidates described a range of correct ways in which a leaflet holder could be made. Fabrication was the most common correct response. Some candidates focused very heavily on marking out, often producing limited or no description of other key stages.
- (b) Most candidates fabricated the leaflet holder, and the sharp edges of the leaflet holder shown in the figure would suggest that fabrication would be most suitable. Bending and folding were also awarded credit.
- (c) Most candidates changed materials and selected injection moulding as a method of manufacture. This was inappropriate as only 50 leaflet holders were required. The use of templates and jigs would have been more appropriate.

Question 2

There were some well written responses, covering a wide range of issues and using relevant examples as evidence to support answers.

Some candidates did not consider all of the three factors highlighted in the question. Most candidates focused mainly on environmental or economic factors.

Question 3

- (a) Die casting and making a mortice and tenon joint were the most popular choices. Most answers were very detailed and many candidates demonstrated a very good knowledge of all of the processes stated.

There were instances where some candidates focused too heavily on one aspect of the process, often missing important stages, and could not access the full mark range.

- (b) This part was answered very well and candidates gave detailed and valid explanations as to why the process was particularly suitable.

Part B – Practical Technology

Question 4

There were no attempts at this question.

Question 5

There were no attempts at this question.

Question 6

There were no attempts at this question.

Part C – Graphic Products

Question 7

There were some excellent responses to this question. The majority of candidates produced a planometric drawing of the classroom to an appropriate scale and included most, if not all, of the features. Almost all responses had the majority of features drawn in the correct positions and to the correct dimensions. The tables proved problematic for some candidates and not all candidates included 12 lockers in the locker unit. Line quality and accuracy was generally very good.

Question 8

This question was generally answered well. Most candidates explained two or three of the techniques fully with a small number of candidates producing fully detailed responses. Bar charts and tables were clearly explained by most candidates, but pictograms and graphs were not described fully or accurately by others. Sketches were clear and easily understood. Not all candidates gave examples of the techniques.

Question 9

There were many excellent, fully detailed responses to this question. All candidates made reference to the impact of computers on the generation and presentation of design ideas and gave specific examples as evidence. Opportunities for collaborative work and the integration of data for costing, stock control and production were generally less well covered.

Section B

The overall performance of candidates on this section was good. Presentation was particularly strong and almost all candidates fully completed all requirements of the question chosen.

All candidates produced an adequate or better range of ideas with a number including the exploration of sub-problems. However, a significant number of candidates did not produce creative or innovative options, presenting mostly very basic and similar design ideas, particularly in **Question 10**. Ideas generated, often had limited personal interpretation and exploration and could not access the higher mark ranges.

Most candidates demonstrated a clear knowledge and understanding of appropriate materials and construction techniques in the annotation of ideas and development to a single design proposal.

The development of ideas section was generally good. Clear design decision making was evident in the stronger responses. Some candidates focused mainly on a method of manufacture with limited reasoning and composition of ideas to decide upon a single final design proposal.

Proposed solutions were generally feasible and well presented. Most candidates included dimensional details and specific features such as materials and finishes.

The evaluations of the proposed solution were generally good and many candidates produced a valid evaluation of the proposed solution based on the specification, describing the strengths and weaknesses of the product. Some candidates sketched possible improvements which provided useful insight.

Question 10

Acceptable specification points included:

- the product could have a lid to prevent waste food smells in the kitchen
- the product must be made from materials that can be regularly washed for hygiene purposes
- the product must hold the compostable bag securely so that all food waste is contained and does not spill out
- the product must be quick and easy to attach and remove from a wall-mounted situation to prevent possible spillage.

Most candidates fully considered the given design requirements, but a significant number of candidates did not consider the size of the compostable bag and produced designs for very large, wheeled trolley devices. Some candidates made very good attempts to be creative in the design of the overall shape, detailing options and lid opening and securing methods.

Development was generally good, with many candidates showing clear design thinking and the reasoning employed to arrive at a single design proposal. A significant number of candidates focused too heavily on how the product would be constructed.

Final proposals were generally functional and were described in sufficient detail.

Evaluations were generally good although a number of candidates produced tick lists with limited comment on strengths and weaknesses of the proposal.

Question 11

There were some high-quality, technically detailed responses to this question. Most candidates focused on a freestanding product with a simple holding device, usually to support the crossbar or the frame of the bicycle. Not all candidates considered the requirement of the product being height adjustable. Most candidates considered the protection of the bicycle when it is being held and made appropriate mention of possible materials and construction methods.

Most design drawings were clear and easy to follow showing the main functions and included good annotation. The stronger responses included details of disassembly or the ease of folding to save space when not in use.

Final proposals were mostly feasible, well drawn and dimensioned. However, a few final products would not have held a bicycle securely enough to carry out any inspection or repair and some candidates did not make reference to obvious weaknesses of the product in their evaluations.

Acceptable specification points included:

- the product should hold the bicycle securely and in different positions to carry out a full range of repair tasks
- the product should have a tool tray attached to allow quick access to tools and equipment
- locking devices on the product should be easy to control and quick to activate
- the product should have a sufficiently wide base to ensure stability, extendable legs may be used.

Question 12

There was a very wide range of responses to this question. Most candidates designed a name and a logo for the project and some were very innovative and eye catching. There were some excellent examples of freestanding displays that were able to hold the information sheets and reflect the image of the project well. Not all candidates considered the requirement of the display to be interactive and could not access the full mark range.

Acceptable specification points included:

- the display must have an interactive feature that will attract, interest and engage people who are looking for information
- the display should be easily disassembled or folded for storage
- the display should be able to be re-used for other events so interactive features and other elements could easily be adapted for other projects
- the name and logo should be colourful and exciting to immediately capture the attention of passers-by and clearly indicate the theme of the project.

Most candidates produced a range of ideas for a name and logo, but a number of candidates only produced a single idea. Similarly, most candidates produced a range of ideas for a display but relatively few produced different ideas for the interactive feature. Most candidates did not include specific material and construction details of the display.

Some final proposal drawings were outstanding, fully dimensioned and detailed and well considered evaluations were provided. A significant number of candidates did not give dimensions or details of the final proposal or evaluate the final proposal fully.

DESIGN AND TECHNOLOGY

Paper 9705/04 Project 2
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Key messages

- Candidates are advised to focus on their design need and brief throughout the analysis and research stages of the project rather than on any preconceived idea of an outcome. The product specification should evolve from this analysis and research so that it can be referred to throughout the generation and development of ideas.
- It is important that candidates understand fully the requirements of the Product Development criterion in Project 2. This is a substantial and important stage in the development of the selected design idea and should be presented as evidence of practical design thinking rather than a collection of information on materials, constructions, finishes and other items, as was often the case.

General comments

The school-based assessment for this syllabus can be offered either as two discrete components, Project 1 and Project 2 or as one larger piece of work combining the two projects in a holistic way. This report identifies each of the components separately but also acknowledges the overall design process where the two are combined.

Centres introduce this important part of the Design and Technology course to their candidates in slightly different ways but it is important that evidence produced matches the requirements of the assessment criteria. Some centres set a common theme or topic to which candidates respond in their own way while others encourage each candidate to identify their own design problem which may be derived from hobbies, interests or life at home and in the community.

Outcomes were produced 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 or architectural models, there were a number of interesting outcomes of either modelling or final products. Examples of these outcomes included: modular tool guide, pet water station, paintbrush cleaner, waste water collection, shuttlecock holder, tape dispenser, multi-functional workbench, chocolate display box, headset stand, drawing desk, garden swing, chicken egg incubator, phone storage unit with charger, projector stand, multi-gadget holding device, cycle weather guard, airboat, drone, camping chair, keychain organiser, sun glasses, pizza cutter, trumpet storage, cable management, door flood barrier, floating waste collector, medicine organiser, artist's easel, go kart, bike and kayak trailer and basketball trophy.

Centres are reminded of the requirement to include detailed photographic evidence of the model for Project 1 and the final realised product for Project 2.

Comments on specific assessment criteria

1 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 criteria 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 was not always clear why selections of materials, components, constructions, finishes and production methods had been made and there was often a big gap between the chosen design idea and the final product. Once these decisions had been made, the final part of the development should have included details of the final solution, mainly in the form of drawings, from which a skilled person could make the product.

2 Product planning

Most candidates set out the sequence for the main stages of production and 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 but some photographs can be helpful when highlighting certain aspects of the manufacturing process.

3 Product realisation

Many candidates produced high quality products that could clearly be put to their intended use. Candidates had taken care and showed enthusiasm in the making of their design outcomes in terms of construction methods and finishing techniques. Many well developed practical skills were 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. These must be submitted as part of the project folio for moderation purposes.

4 Testing and evaluation

Many candidates carried out meaningful testing and evaluation. This can only be achieved if the product is shown to be put to the use intended and the results compared to the original design brief and specification. It is always helpful when candidates include photographs of the product being used and tested in the intended environment.

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