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FOREWORD

This booklet contains reports written by Examiners on the work of candidates in certain papers. **Its contents are primarily for the information of the subject teachers concerned**.

DESIGN AND TECHNOLOGY

GCE Advanced Level and GCE Advanced Subsidiary Level

Paper 9705/01
Written

General comments

Candidates responded reasonably well to the vast majority of questions on the Paper. In some cases, however, candidates relied too heavily on general knowledge rather than subject specific knowledge in the responses that they made to questions. In ***Section C*** many candidates listed issues rather than discussing them in the manner that was outlined on the front page of the Question Paper. There were no candidates who answered more questions than they were required to do but there were a number who failed to complete all ten questions.

Comments on specific questions

Section A

Question 1

(a) Most candidates correctly identified two pieces of anthropometric data that were linked to hand and finger sizes.

(b) This was well answered with many candidates being able to state correct features relating to the shape and size of the remote control and the size and position of the buttons.

Question 2

This question required candidates to *state* and *explain* one advantage and one disadvantage. While many candidates made appropriate statements fewer went on to support their statements with any real explanation.

(a) Many gave the advantage that the skittle carrier would be lightweight if it were made from corrugated card. The most common form of explanation was that it would be easier for children to carry.

(b) The most common, appropriate, limitation given was that the material was not very strong. Candidates' sometimes went on to explain that it could be easily damaged and torn or become soggy if it got wet.

Question 3

(a) The majority of candidates were able to state at least one hazard when using a strip heater. The most common hazards stated were linked to burning hands, problems linked with electrical safety and fumes from plastic that had been over heated. Appropriate methods of reducing these risks were frequently given. These included wearing protective clothing such as gloves and goggles and carrying out regular safety checks on the equipment.

(b) This was well answered with most candidates correctly identifying the fumes as being the main hazard and that the best ways of reducing the risk was to wear a mask or work in a well ventilated area.

Question 4

Generally this question was poorly answered.

(a) Non technical terms such as 'round and round' and 'up and down' were much in evidence. It was rare to see both answers **(i)** rotary and **(ii)** reciprocating (linear was also allowed) correctly given.

(b) Again lots of non technical names were given rather than the required cam and follower.

(c) Many candidates gave incorrect answers which still showed a cam but with a different follower. These were not considered sufficiently different to gain the marks available. Appropriate solutions were mechanisms such as a rack and pinion and a crank and slider.

Question 5

(a) Some candidates gave general answers such as wood and plastic rather than stating specific materials such as pine.

(b) A good many candidates gave details about making the whole frame rather than concentrating on how the required cross section of material could be created. The most common, totally appropriate method given was the use of a router. Some answers lacked any real level of technical detail and frequently made vague, reference to the use of saws and files to make the required profile.

Question 6

This was poorly answered by most candidates. They frequently failed to critically examine the issues raised in the question with most talking in very general terms. Some candidates repeated their answer to part **(a)** in part **(b)**. The most common correct issues that were talked about were the problems of identifying different types of plastic and metal. It was rare for references to be made to the important aspects of time, effort and costs associated with recycling.

Section B

Question 7

This was the most popular question in ***Section B***.

(a) The majority of candidates were able to specify a suitable wood and give at least one of the two required reasons why they had chosen it. Strength and appearance were two general terms that were much in evidence.

(b) A good number of answers were too general and failed to give sufficient detail about the three stages. It was common to see statements such as 'Mark out the wood using a try square and pencil' were common but there was often no description of how this would be done. The question asked for sketches and notes to be used. In some cases there was too much unbroken text and too few sketches.

(c) Some very good jig designs were seen but in some cases candidates did not seem to understand the term 'jig'. Some candidates did little more than explain how the holes would be drilled using a pillar drill. A weakness of some designs was that there was no method shown for securing the jig to the work while it was being used.

Question 8

(a) Many candidates failed to fully dimension the net development that they drew. In some cases only four sections and three fold lines were shown rather than the required five sections and four fold lines. Most candidates put the holes and slot on the correct surface but failed to include their size.

(b) Most candidates presented their answers in the form of a table or chart. While a good many showed the main stages of manufacture, the tools and equipment required some of the uses suggested for the tools and equipment were inappropriate. For example some suggested that a centre punch could be used to mark out the holes on the acrylic while others said that the slot could be cut out by just using a hacksaw. It was rare to see details of how the edges of the acrylic would be finished and polished.

Question 9

This was the least popular of the questions in ***Section B***.

(a) Most candidates were able to specify a suitable hardwood and give at least one reason for t choice. Many stated that their chosen timber would be suitable for outdoor use.

(b) Generally answers were correctly related to aluminium being lightweight and resistant to corrosion.

(c) Many answers failed to explain that the holes should be centre punched prior to drilling. A good number did not show how the tube would be held securely and suggested using a hand held drill rather than the more appropriate pillar drill.

(d) This was very poorly answered or not attempted at all. Of those that did attempt this part of the question most tried to describe how a wood turning lathe and hand held tools would be used rather than a metal turning centre lathe. Very little technical knowledge and understanding was displayed by candidates in their answers to this part of the question.

Section C

Question 10

(a) A reasonable number of candidates were able to suggest a suitable material and/or process for making at least one of the two different train bodies.

(b)(i) Candidates were asked to explain two reasons. While many candidates gave two reasons, and in some cases far more, their level of explanation was generally weak. Candidates often tended to list things rather than explain them. Most answered correctly addressed safety issues.

(ii) As with part **(i)** candidates were sometimes able to give reasons but then failed to explain them in sufficient detail to gain full marks. Many answers were based on general knowledge rather than any real degree of subject specific knowledge.

(c) Many candidates failed to discuss recognised safety standards for toys but generally focused on giving a series of specification points such as it must have no sharp corners, it must not be toxic etc. This type of answer gained only limited credit. Many answers failed to use examples.

Question 11

This was the least popular question in ***Section C***.

(a) Most candidates were able to explain at least some of the terms, particularly **(iii)** and **(iv)**.

(b) A good number of candidates were able to give appropriate advantages and disadvantages of using the two types of wheel but again it was the discussion aspect that let many down. For example, few candidates attempted to introduce evidence to support the conclusions of their arguments.

Question 12

This was the most popular question in ***Section C***.

(a) While candidates were generally able to give two properties of stainless steel fewer were able to adequately explain why these made the material particularly suitable for this product.

(b) Generally well answered with most candidates relating their answers to weight and cost.

(c) Again disadvantages were often given but explanations frequently weak.

(d) Well answered, most candidates focused on the non corrosive properties of aluminium and the fact that it can be easily dented and scratched.

(e) Candidates often listed a series of ergonomic factors but then failed to discuss them in the detail required to gain a high mark. Some candidates listed a series of general design points which were not related to ergonomics.

Paper 9705/02
Coursework Project 1

General comments

The work was well presented for Moderation and, generally speaking, design folders were easy to follow. It is very important that clear and detailed photographs of the models produced by candidates for 9705/02 Project 1 are included in the folders. If this is not done then Moderation of this section of the assessment scheme cannot be carried out.

There was a wide range of project types and candidates should be congratulated on the imagination shown. Some work was of an extremely high standard and in line with expectations for Design and Technology at this level of examination. Notable products included rough terrain vehicle, go-kart, bicycle frame, lighting systems, fly tying device, artist's easel, sports pavilion, mobile phone package, promotional material for various initiatives and organisations in addition to the normal range of domestic furniture and other devices.

Although the design process can be evidenced in a variety of ways it would help the Moderator and indeed assist candidates if folders were structured to reflect the order of the assessment criteria contained in the syllabus. Where this had been done it was clear to see how marks had been awarded and, generally speaking, candidates covered all required aspects of the assessment scheme.

The weighting of marks for the individual sections of the assessment scheme should give some indication of the approximate amount of time to be spent on each part of the project.

It is important that the assessment of work is not unduly influenced by the quality of presentation of design folders. Good presentation naturally enhances the content of folders but it cannot be seen as an end in itself.

Centres are reminded to include the Summary Coursework Assessment Form 9705/2/4/CW/S together with the Moderator copy of the computer printed mark sheet MS1 with work sent for Moderation.

Comments on individual assessment criteria

Part 1

Identification of a need or opportunity leading to a design brief

Candidates described the situation clearly but were not always quite so specific about the intended users. It is important that detail is included here to assist in the analysis and research of the design brief which follows.

Part 2

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

Although candidates were generally able to identify a wide range of existing products they did not always relate these to the intended user. This section of the folder must follow on from the design brief and should not include irrelevant information such as the history of products or information on materials and constructions before ideas have been generated and appraised. Materials, components and construction details should be considered at the Product Development stage in 9705/04 Project 2.

There was a tendency for candidates to simply give a description of existing products, often with vast amounts of technical detail, but analysis was missing. It is important that this information is evaluated and commented upon in connection with the intended user and the design brief.

Candidates scoring high marks in this section considered aspects of the requirements of the intended user and included detailed information to be taken forward for consideration in the generation of ideas.

Where 'cut and paste' technique is used no marks can be awarded unless it is accompanied by the candidate's own observation and comment.

This section of the folder must culminate in a detailed specification which has evolved from the analysis and research.

Part 3

Generation and appraisal of design ideas

Generally speaking, candidates produced a reasonable range of design ideas. In many cases the quality drawing was very high and information was successfully conveyed. There were examples of exemplary work indicating that candidates were able to think in an imaginative and innovative way leading to genuine creativity.

However, there was a tendency to show variations of just a few concepts rather than a wide range of different ideas. Ideas were sometimes shown in a rather formal way with little evidence that candidates were really 'thinking with a pencil'. It is important that candidates include all their drawings however rough they may appear to be.

When appraising their design ideas candidates need to show through clear annotation of drawings that they have the specification in mind throughout this stage of the design process. The assessment criterion in the syllabus gives a clear indication of what is expected here.

Part 4

Modelling of ideas

The intention of this section is that candidates develop ideas as far as the modelling stage but do not become too involved in the detailed development of the final product in terms of materials and constructions.

They should therefore show evidence that they have knowledge of modelling materials and can choose those most appropriate to the design being considered.

Where products include particular mechanisms or structures it would benefit candidates if they included evidence of modelling of these. Construction kits can be put to good use for this purpose as they can be reused once photographic evidence has been taken. As mentioned earlier it is a requirement of the assessment scheme that photographic evidence of modelling is included in all design folders.

Paper 9705/03

Written

General comments

Centres have generally prepared candidates well and most candidates answered the correct combination of questions. In most cases candidates devoted appropriate time allocations to the different sections.

There has been a significant improvement on ***Section B*** with some candidates achieving very high marks.

Some candidates did not answer two questions in ***Section A*** and a few candidates did not leave enough time to make a full attempt at ***Section B***.

It is recommended that candidates spend 20 - 25 minutes on each question in ***Section A*** and at least 100 minutes on ***Section B***.

In ***Section A***, *Parts A* and *C* were the most popular options. In *Part A* there was an even spread of attempts at all three questions. In *Part C* **Questions 8** and **9** were the most popular.

Question 10 was the most popular in ***Section B*** followed by **Question 12** and **Question 11**.

Comments on specific questions

Section A

Part A – Product design

Question 1

Very few candidates made an attempt at this question. Responses tended to be very brief and lacking detail. Turning, blow moulding and injection moulding were given as the main methods of producing the sphere. Specific materials were rarely given and candidates generally did not include methods of ensuring accuracy.

Question 2

A popular question, generally well answered.

(a) Hardening and tempering and compression moulding were the most popular choices. The best responses used well annotated sketches to describe the process in detail. Some candidates confused compression moulding with injection moulding.

(b) Several candidates missed this part of the question.

Question 3

Very few candidates attempted this question. Some answers were extremely well written, raising several issues concerning cultural and aesthetic needs when designing jewellery and using relevant examples to explain and interpret the issues.

Part B - Practical technology

Question 4

There were no attempts at this question

Question 5

Few candidates attempted this question. It was generally well answered with candidates referring to appropriate examples to explain how energy efficiency is achieved.

Question 6

There were no attempts at this question

Part C - Graphic products

Question 7

There were some outstanding answers to this question. Most candidates were able to create an accurate perspective drawing and apply appropriate rendering. Some candidates, however, produced isometric drawings and were not able to access the full mark range.

Question 8

A popular question with a number of excellent responses. Most candidates were able to discuss fully how computers influence the work of designers in research, presentation, stock control and manufacture.

Question 9

Several candidates did not attempt **(a)**. Most were able use examples to describe pictograms and flow charts.

The majority of candidates produced accurate orthographic drawings although some did not fully dimension the drawing as requested. Most used the correct symbol to indicate the angle of projection although some confused first and third angle.

Section B

This Section was answered very well by most candidates. Some answers were outstanding and Ce to be congratulated on preparing and guiding candidates to produce high quality responses in the allowed.

Most candidates prepared their answers on A3 paper as instructed.

Analysis

Some candidates repeated the given problem and did not look at the wider issues involved.

The best responses indicated at least 5 detailed points of analysis relating to the given problem.

Some candidates used scattercharts but in a number of cases, used single words e.g. 'safety', without any further qualification.

Specification

Most candidates were able to produce a list of at least 5 detailed specification points.

Each question provides initial specification points or data. Candidates are expected to produce a list of five other points.

Exploration

There was a significant improvement in this area. Most candidates produced a range of well presented ideas with clear annotation and gave sound reasons for the selection of features to be developed.

Development

Again, a significant improvement from most candidates who provided a clear development of ideas into a single design proposal. Candidates gave clear details of specific materials and construction methods.

Proposed solution

Most candidates produced either orthographic or dimensioned pictorial views of their proposed solution. Some candidates do not leave enough time to produce an appropriate drawing showing the complete solution.

Evaluation

Most candidates produced a full evaluation, many making some reference to the initial specification of the proposed solution. Candidates are not required to produce a lengthy evaluation, it is advisable to focus on five aspects of the solution.

A more detailed breakdown of the assessment criteria for ***Section B*** is given in the Mark Scheme.

Question 10

A very popular question. Most candidates used their time well and demonstrated excellent design technique in proposing a range of ideas. Some candidates achieved very high marks for exploration of ideas by focusing on different aspects of the problem e.g. adjusting mechanisms, folding or quick assembly systems, rather than producing three or four full solutions. The development of ideas, in most cases was most impressive.

Question 11

Very few candidates attempted this question.

Question 12

A very popular question. Many responses were simply outstanding and some candidates were very achieving maximum marks. Candidates produced a range of solutions for the cartoon style characte the packaging. A number of candidates did not pay a great deal of attention to the requirement to selec appropriate lettering style. Presentation of work in some cases was most impressive. Constructional details included printing and assembly were evident in most cases but a few candidates did not develop their ideas or produce a final design proposal.

Paper 9705/04

Coursework Project 2

General comments

See **General comments** for 9705/02.

Comments on individual assessment criteria

Part 5

Product development

This is the opportunity for candidates to take the chosen idea from the previous sections and to consider all aspects of form, material selection, construction and production methods in detail. All information should be linked directly to the chosen idea and, where this is technological in nature, should include details of components to be used.

This section should take account of all modelling undertaken and should show evidence of clear thinking together with reasons for decisions made about form, materials and constructions.

This was the weakest section in many projects leading to uncertainty as to how the product had developed from the final idea to the artefact produced.

Part 6

Product planning

Candidates are expected to plan the production of the artefact before any work commences. There should be an indication of the overall sequence of operations linked to some form of time plan together with a list of materials to be used.

Drawings should provide all detail required for the artefact to be made by an experienced person.

This section *must not* be produced after the completion of the artefact, as it then becomes a record or diary of what has already happened. Marks cannot be awarded for this approach. It must be a true plan indicating that thought has been given to the order in which operations will happen.

Part 7

Product realisation

The assessment of this section is based on the way in which candidates have independently undertaken the making of the artefact together with the quality of the final product. Candidates are expected to take on tasks appropriate to this level of examination and to produce work of a high standard and quality of finish.

The assessment of quality of production should be based not just on the outward appearance of the artefact but also, for example, on the way in which components and mechanisms have been included.

It is important that photographic evidence includes overall views of the product together with close up detail showing the quality of work produced.

Part 8

Testing and evaluation

There was evidence of critical testing in many cases and this led to the identification of opportunities for modification and improvement. Testing is always more meaningful where a potential user of the product can be involved and this is supported by photographic evidence.

Evaluation must refer to all specification points and comment on the level to which these have been satisfied.

Many folders contained evidence indicating that designs had been carefully thought through with subsequent acceptance and approval of the intended user.