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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 Ordinary Level

Paper 6043/01

Paper 1

General comments

Candidates made good attempts at the questions set, with some Centres scoring quite highly. However, in many Centres there is a noticeable lack of depth in many of the answers, with candidates only giving partial answers to basic processes, or missing out important stages, tools or materials. Quite a number tried to make the same process fit every situation, no matter what the object or best possible production method available.

Comments on specific questions

Part A

Question 1

In (a) most candidates stated either copper or stainless steel for the water pipes, some however suggested aluminium or steel. A few even gave PVC as a metal.

Part (b), the possible metal for the chisel blade, was less well answered, with a number giving high speed steel, cast iron, brass, etc. The best gave either high carbon steel or tool steel.

Question 2

Only a few better candidates able to give the correct name for M.D.F. Medium Density Fibre Board.

Question 3

Large number of correct answers for (a) blow moulding, but few gave compression moulding for (b). Less able candidates gave vacuum forming for (a) and injection moulding for (b).

Question 4

Poor sketching let candidates down, many drawing the bar with holes but failing to add shoes or clamp. Some missed out the use of such a tool.

Question 5

Part (a) was well answered by nearly all candidates who gave goggles and the protection of the eyes. However part (b) caused problems with many weird and wonderful suggestions, such as chest shield, knee pads, etc.

Question 6

Some very vague answers for the reason for 'research' in design work. Many just repeated the same point three times.

Question 7

Generally well answered by all.

Question 8

Generally well answered but some candidates had problems with the word 'forms' and misinterpreted it to mean names of plastics or types.

Question 9

Most candidates knew the answer but did not give enough detail to explain that it involved beating and hammering metal to shape.

Question 10

Most candidates only gave sandpaper as a type of abrasive, others got confused and gave types of finishes.

Part B

Section 1 -Tools and Materials

Question 11

- (a) Most candidates seemed able to identify the three tools, however some failed to give specific names and just gave general terms such as plane, file, and drill. Having identified the tools a number of candidates failed to go on and explain the purpose of each.
- (b)(i) Not very well answered with many candidates confusing the lever cap with the cap iron.
- (ii) This was generally well answered and many gave valid reasons for the use of chalk.
- (iii) This was a surprise, as many candidates did not know the reason for cutting fluid when drilling. Most thought it was for lubrication.
- (c) Some misinterpretation again with a number of candidates giving the reason why 'tools' need holding, rather than answering the question which asked why work needs to be held.

Question 12

- (a) Generally well answered with (i) chloroform or tensol cement for joining the acrylic; (ii) nails or panel pins for joining the pine boarding; and (iii) brazing, soft soldering, silver soldering, welding, or riveting for joining the mild steel.
- (b) Often only two solutions offered, the screw, and nut and bolt. Some of the sketching was quite limited and lacked real detail. A number of candidates gave wood joints, which was incorrect.
- (c) Most able to name two tools such as screwdriver and spanner but failed to explain how they are used.

Question 13

- (a) Good answers in the main, with most able to state two valid properties for a suitable material.
- (b)(i) Most only gave one reason why the plywood was unsuitable, stating it would break but not why.
- (ii) Many candidates gave one answer, that steel will rust, but failed to state the effect on food. Better candidates added that weight was a problem.
- (iii) Once again many stated the expanded polystyrene would break but did not explain why.
- (c) All able to name a material, which generally was acrylic, but then let down by poor detailed sketches of the two suitable forming tools. Some candidates finished up drawing marking out tools such as a scribe or compass, etc.
- (d) All candidates gained at least one mark in this section with only the rounding of edges missed.

Question 14

Perhaps the most popular question. Candidates answered it quite well.

- (a) Most candidates suggested suitable specific materials for the different parts of the balance, with only a few talking in general terms. Reasoning however was weak in many cases.
- (b) The making of the hanger tended to be the favourite choice for most candidates, with the making of the pan second. This produced some good sketching and staged explanations. A number of weaker candidates used the wrong tools on certain materials.
- (c) Many solutions given just hung weights from the slot and failed to fix them in any way. Others used crude string solutions. The best answers suggested slots or locking systems for the weights.

Question 15

Another very popular question.

- (a) Most of the answers in this section lacked real detail with the word 'strong' just being repeated for each material. Acrylic was perhaps the best-understood material, for its protection and colour properties.
- (b) Although well attempted, many of the answers lacked real depth of understanding. For (ii) in many cases candidates tried to screw the wooden slats to the metal frame, which was impossible unless self tapping screws could be used. Not mentioned! It would have worked the other way round, with the metal frame screwed to the slats. When painting the framework few mentioned cleaning the frame first or leaving the paint to dry between coats.

Question 16

Some good answers but only a few candidates attempted this question. Less able candidates tried to explain making the wrong part.

- (a) Aluminium was the most common material chosen, with turning on the lathe as the method of manufacture. Few suggested casting or injection moulding.
- (b) Those that chose the lathe started quite well but then got slightly lost in the process and missed out major details in the making. Most showed a limited knowledge of lathe work. Less able candidates tried to explain bending the rail.
- (c) Most used some form of 120° angles but failed to give details of how this was done or what tools could be used to achieve this.

Question 17

- (a) A common fault with many candidates was to suggest a solid timber as a suitable material, the tool tray had to be made from some form of sheet material or be formed by injection moulding.
- (b) Most answers in this section would have proved unsuccessful, with many of the fabrication methods suggested only suitable for large thickness material. Screwed joints and large nails would not work.
- (c) Very few detailed answers, with many just showing a vague pin arrangement without specifying the hole or pivot or locking method.
- (d) Most just gave a partition system and nothing else. Few considered holding tools.

Question 18

Another very popular question.

- (a) Well answered by most with 'lightness' as the major property given.

- (b) Again well answered with a timber such as pine as the main material for the handle and plywood/acrylic or aluminium for the blade.
- (c) A large number of candidates spent time making the whole blade when only producing the slots was required. The process was quite well done with a number chaining drilling first then cutting out the waste with an appropriate saw. Less able candidates tended to get mixed up and use the wrong type of tool for the material being worked.
- (d) This process was not well explained, with many just suggesting an adhesive without considering the joint needed or the materials being joined. Better solutions screwed the bridle joint together.

Further general comments

Without exceptions candidates made valid attempts at all the questions and time did not seem to be an issue. Few candidates made rubric errors and these tended to be only parts of questions such as **Questions 14 (b) and 15 (b)**.

The results tend to show that candidates now have limited understanding of casting and lathe work, and that metalwork knowledge has decreased over the last few years. Candidates seem to base their answers around wood whenever possible or as a last resort, acrylic. Centres do need to encourage candidates to explore a wider range of materials and skills if they seek to improve standards.

Paper 6043/02 Design Project
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General comments

Candidates were able to interpret the theme *Movement* in a variety of ways and considered many of the focus areas suggested in the Question Paper.

Design folders were very well presented and generally set out clearly with a list of contents so that the different sections could be identified easily. This was very helpful to the Moderator.

However, candidates need to be reminded of the weighting of marks for each section of the assessment scheme so that the amount of time devoted to the corresponding section of the folder reflects the maximum marks available.

The assessment carried out by Centres was generally consistent although, in some cases, marks required adjustment to bring them into line with the agreed standard.

Comments on individual assessment criteria

The folio

General analysis of topic

The analysis of the theme should lead candidates to the selection and identification of a problem leading to their design brief. They should keep an open mind at this stage, consider a range of interpretations and be sensitive to possible design problems.

The analysis of *Movement* was very broad indeed and covered everything from the design of toys and domestic equipment to tools, farm machinery, robots, escalators and items linked to the wind and sea.

There were a few cases where candidates started to consider materials, components and constructions at this stage, which is too early for the award of marks. This should appear in the Detailed Development.

There was a tendency for some candidates to spend too much time on this section of their folders at the expense of other sections, particularly the Exploration of Ideas.

Design brief and specification

Few candidates were unable to write a clear design brief but specifications were sometimes too general and could have applied to a whole range of problems. Candidates should take the opportunity to mention particular requirements of the brief and, where general specifications are given, they must be further qualified in relation to the particular design situation.

Exploration of ideas

This is one of the most important sections of the folder where candidates have the opportunity to be as creative as possible, recording any ideas relating to their brief. There are no right or wrong answers at this stage and candidates should be encouraged to use informal drawing techniques to record their ideas. It is important that the design thinking is set out through the use of annotations.

Candidates who produce a good balance between drawings and relevant text centred on a range of whole solutions or part ideas can achieve good marks in this section.

Detailed development of proposed solution

This section should make a significant contribution to the development of the overall design and as such is given a high mark weighting.

However, many folders contained very little true development focusing on ideas and part ideas identified in the previous section. Very often it was simply a repeat of information already seen and there was limited evidence of the consideration of alternative constructions, detailed shaping and materials. Where alternatives were given these often bore no relation to the particular design idea under consideration.

When alternatives are identified they should be annotated to give reasons for the final selection. This section should give the impression that the folder has been used as a tool to solve design problems.

There were some very clear and detailed working drawings.

Suitability of chosen materials and constructions

Marks can be awarded in this section only where candidates have given valid reasons for their selection of materials and constructions in the development section of their folder.

Production planning

Most candidates were able to give an outline sequence of events leading to the completion of the product. In some cases this was linked to particular dates or weeks.

Unfortunately, there were cases where this section was written as a record or diary of what had happened. In these cases candidates should not be awarded high marks.

Although candidates are encouraged to describe the more complex tasks and techniques in this section, there is no need to show simple tasks such as the marking out and preparation of materials.

Communication

The standard of drawing and other communication techniques was generally high and most folders were easy to follow. Some candidates should be congratulated on outstanding presentation skills showing both clear drawing methods and good use of colour.

The Artefact

Suitability of proposed solution

In some cases it was difficult to identify a clear link between the original brief and the final artefact. However, most artefacts appeared to function successfully and there was little evidence of unfinished work.

Workmanship

Many folders contained clear photographs of artefacts overall and most appeared to be well finished. Unfortunately, there were others where this requirement of the examination was not fulfilled.

It is important that photographic evidence includes overall views and close up detail of all aspects of the construction and finish, for the purpose of external moderation.

There were examples of creative and innovative products indicating that candidates had gained much from their Design and Technology course.

Evaluation

Many candidates missed the opportunity to gain high marks in this section through a superficial approach to their evaluation and little evidence of testing. Reference should be made to the original specification and the product outcome should be critically appraised through objective comment.

A simple tick list of the specification points indicating whether or not, in the eye of the candidate, each has been met is not sufficient and cannot be awarded high marks. Where this technique is used there should be further comment giving reasons why the specification point has, or has not, been met.

Candidates should also be encouraged to record, with reasons, all modifications made during the construction alongside opportunity for further modification.