

# CONTENTS

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<b>DESIGN AND TECHNOLOGY</b> .....	<b>2</b>
<b>GCE Ordinary Level</b> .....	<b>2</b>
Paper 6043/01 Paper 1 .....	2
Paper 6043/02 Design Project .....	5

## FOREWORD

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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

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## GCE Ordinary Level

Paper 6043/01

Paper 1

### General comments

The examination had a much larger entry this year than last, with the more able candidates gaining some excellent results. Overall the performance of candidates was about the same as last year, with many scoring highly on **Section A** but then falling down in the other two sections. Those able to name specific materials, correct tools, and real stages in a process gained the highest marks. Less able candidates still tend to use general terms such as 'saw', 'heat', 'wood', etc., missing out the detail required at this level. A number of Centres allow their candidates to separate drawings from text and provide candidates with drawing sheets. Not only does this confuse the candidate it makes it extremely difficult for the marker to follow the train of thought and find the whole answer. Centres are advised that candidates should provide all their answer, both text and drawings on lined paper.

### Comments on specific questions

#### **Section A**

##### **Question 1**

Most candidates were able to provide the correct answer to this question - mild steel would rust and pine would decay on contact with water.

##### **Question 2**

In the main this was well answered, however a number of candidates mixed up a hexagonal nut with a hexagonal bolt, and a pop rivet with a snap head rivet.

##### **Question 3**

This question was quite well answered with a range of plastics suggested: nylon, polypropylene, etc., with reasons such as colour, easy to clean, etc.

##### **Question 4**

This question was well answered in the main, with work held correctly, tool rest support, face mask, dust mask, etc. all given as possible safety areas. A number of candidates suggested using gloves.

##### **Question 5**

Most candidates seemed able to score one mark by stating that 'modifications' meant changes to a project but failed to state why.

##### **Question 6**

There was some excellent sketching for this answer, which included food containers, packaging, cups, etc.

##### **Question 7**

Most candidates were able to state that chipboard would break when subjected to a load but failed to explain the reason why.

### Question 8

This was well answered by nearly all candidates – naming the odd legs and showing the tool in use. Only the setting of the tool seemed to cause problems.

### Question 9

Only one answer tended to be given for this question – plastic coating of metal. Most missed acrylic paint, polypropylene varnish, polythene film, melamine sheet, etc.

### Question 10

This question was very well answered by most candidates; however a number did sketch a Tee hinge, a cupboard lock, etc.

## Section B

### Question 11

This was a popular question with most candidates, who gained good marks in part (a). However, in part (b) they showed a lack of understanding.

- (a) This was well attempted with candidates showing knowledge of polythene, mahogany, high carbon steel, lead and plywood. However, only the better candidates were able to give the special properties and uses of epoxy resin.
- (b) This part of the question really did differentiate between candidates, with the better candidate able to describe a range of simple tests used to identify a material.

### Question 12

This was not a popular question.

- (a) Better candidates did well, but a number who attempted this question failed to identify the three tools shown. Many thought that *Tool A* was a centre punch when it was a nail punch, most knew what a thread tap was, but again failed to name the snap and set tool.
- (b)(i) All candidates understood the reason for the knurled body on *Tool A* - to give better grip when hammering.
- (ii) Again, this part was quite well answered with most candidates giving the need for turning and the tap wrench. Some candidates thought this square top was again for hammering.
- (iii) Most candidates seemed able to give the correct use of the tool even if they did not know the name.
- (c) Only the sketching let candidates down in this section. Most were able to identify a suitable tool, however many failed to explain how it worked together with the tool in part (a).

### Question 13

Very popular question attempted by most candidates.

- (a) All candidates seemed able to give two valid safety considerations for a material: weight, non-toxic, fireproof, does not conduct electricity, etc.
- (b) Quite well answered by most candidates. There were only a few incorrect responses such as copper will rust or MDF is very heavy.
- (c) The answers again were let down by some poor sketching that lacked detail. Most candidates were able to give a marking out and cutting tool. However, a coping saw should look as though it has a frame, handle and blade. A number of candidates just named the tools when the question asked for sketches.

#### Question 14

Another very popular question.

- (a) Most candidates gave acrylic as the suitable material with colour, ease of shaping, etc. as the reason for choice. A few gave metals such as mild steel, aluminium or copper, which would have worked. Poor candidates suggested MDF.
- (b) All candidates seemed able to give the correct development of the holder, with only the dotted folding lines missing.
- (c) The better candidates showed good understanding of the processes.
  - (i) Most candidates described clamping the work on a bench or in a vice with support and cutting out the shape with a coping saw, abrafile saw, etc. having first drilled the holes. Less able candidates did not state how the work was to be held or supported.
  - (ii) The better candidates described drawfiling the edge, then scraping, then the use of wet and dry paper before polishing to give the finish.  
  
Some simple answers just stated "sandpaper it".
  - (iii) All candidates understood the process of using the hot wire system as a means of bending acrylic, it was only the detail that let many candidates down. Those that had chosen metal gave a correct method of bending even to the extent of using waste wood as a hammering aid.

#### Question 15

Quite a popular question.

- (a)(i) A range of material was suggested for the spinning dice including nylon, brass and pine. However, many candidates just stated wood, plastic or metal.
- (ii) The two most popular methods of production were injection moulding and the lathe.
- (b) This part was well attempted by most candidates, who tried to describe either the injection moulding process or the lathe. All started well with good detail but then fell away in the latter stages. For example in the injection process many gave the correct set up for the machine – with plastic granules, hopper, screw, heater, mould – but then failed to explain how the process worked.
- (c) Only a few candidates seemed able to give a suitable method of numbering the faces of the dice – most suggested some form of branding iron on plastic.

#### Question 16

This was not a popular question.

- (a) This part was quite well answered by those candidates who attempted it. Most described holding the bar in the vice, then used a die and holder, and gave the correct turning action. Only the bar preparation, using a Vee block, checking for squareness, lubrication, was missing.
- (b) Fixing the sides was less well done with a number of candidates trying to bolt the sides together. The best answers used the screws suggested in the question and explained in detail how the number was worked out, the sides were held together, the pilot and clearance holes were made, countersinking, etc.
- (c) What should have been the simplest of the processes, plastic coating, turned out to be the one that caused the most problems. Most candidates talked about molten plastic and dipping the object into the solution. Only a few understood the real process.

### Question 17

Very popular with all candidates.

- (a) A wide range of suitable materials were suggested including plywood, MDF, mild steel, aluminium, acrylic, etc., with lots of valid reason thin sheet strength, colour, weight, etc.
- (b)(i) Only lack of detail let candidates down. Most candidates used a pair of odd legs for marking out, although some used a marking gauge with the MDF.
- (ii) This part was quite weak, with most candidates just stating 'drill' with no other details of support, holding, etc.
- (iii) Most candidates understood the need to drill two holes at the ends of the slots but then failed to explain how the rest of the slot was removed. Only one word appeared – "file".
- (c) This part was not very well answered at all. Few candidates offered any suggestion why materials such as acrylic or mild steel need something adding to their surfaces to aid marking out.

### Question 18

Again, this was a popular question that was not well answered.

- (a) Most candidates were able to suggest a suitable material for the domino.
- (b)(i) There were very poor answers to this part with many candidates just describing cutting the domino in half then gluing it together again. Others described industrial processes even though the question asked for simple building up from a number of parts.
- (ii) Most candidates suggested injection moulding but failed to give much detail, others offered vacuum or blow moulding but gave poor descriptions of the processes. Not very well done, maybe because this was the last question and candidates were running out of time.
- (c) Not very well answered with only coloured paint being offered by many candidates as an improvement, the best candidates suggested textures, dimples, holes, etc.

### Final comments

On the whole a good year for candidates with many scoring quite highly, showing that with good teaching of the Syllabus and dedication excellent results can be achieved. However, some Centres need to be reminded that allowing candidates to answer questions on both drawing paper and lined paper wastes time and makes marking difficult. Rubric errors also occurred this year, and candidates need reminding that answering all questions will not bring success.

<p><b>Paper 6043/02</b> <b>Design Project</b></p>
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### General comments

Candidates were able to interpret the theme *Secure Storage* 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.

## **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 *Secure Storage* was very broad indeed and covered everything from the design of storage for valuables, drugs, bicycles and personal items to those items that may be at risk from fire or contamination and the traditional storage of food and other agricultural products at risk of damage by animals and pests.

There were still a few cases where candidates started to consider materials, components and constructions in this section although this problem is diminishing. Consideration of these items should appear in the **Detailed development**.

There is still a tendency for 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.

On the other hand the specification should not be so detailed that it starts to solve the design problem but should set out the requirements of the final product, whatever form it might take.

#### **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 that is centred on a range of whole solutions or part ideas can achieve good marks in this section.

#### **Detailed development of proposed solution**

This section makes a significant contribution to the development of the overall design solution 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.

It was encouraging to see that candidates had made good use of a variety of modelling techniques and 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 given 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 still a few cases where this section had been 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**

Unfortunately, in a few 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**

This section of design folders is improving and it is obvious that most candidates are now seeing this as an important part of the design process.

However, some 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.