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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

The overall performance of the candidates was very much in line with last year's standard. However, fewer candidates are failing to reach the possible grade E level.

Some of the illustration work presented by candidates was outstanding; however, some only had time to answer two or three main questions. It is important in an examination situation that candidates attempt all the required questions if they hope to score highly.

A number of Centres are again supplying their candidates with large sheets of drawing paper in addition to the lined booklet. This makes it difficult for candidates to organise their work, with many mixing up answers and drawings in no particular order. The Examiner then has the difficult task of trying to sort out the relevant parts.

Rubric errors are starting to appear again in some Centres after a lapse of some years. Centres do need to remind students that this practice gains them nothing and wastes valuable time.

Comments on specific questions

Part A

Question 1

Most candidates gained full marks for this question. Expanded polystyrene was the most popular material suggested due to the fact that it floats.

Question 2

This question was only partly answered with most candidates able to sketch a round headed nail but failing to give the correct oval nail.

Question 3

This was not well answered by candidates, with many just stating that you 'worked on a model'. Only the better candidates gave the details that it was a smaller or part version of the final solution used to test movement or function.

Question 4

Well answered by nearly all candidates who identified the three dangerous situations.

- (a) Stepping on the nail or cutting the hand with the nail.
- (b) Slipping on the split oil.
- (c) Knocking the machine vice from the bench.

Question 5

Most candidates seemed only able to name one metal that goes into forming brazing rod.

Question 6

This question was well answered with only Part (c) causing problems.

- (a) Most noted that the paint solvents would evaporate and cause the paint to dry out.
- (b) Some candidates showed the correct method of marking out to explain the waste of material.
- (c) Only a few candidates compared casting to cutting and the waste produced.

Question 7

Better candidates gave the answer 'grinding' and 'use of oil stone'; the remainder just gave the file.

Question 8

Not well answered at all! A number of candidates gave the countersunk part of the hole but failed to identify the clearance or tapping holes.

Question 9

Another well answered question with most candidates able to give valid reasons for using plastic and injection moulding.

Question 10

Not well answered, most candidates were only able to suggest sandpaper for the two items.

Part B

Question 11

A popular question with candidates but many failed to score highly.

- (a)(i) Quite well attempted but only partly successful. Most understood the danger of the protruding screw and nail in the hammer head but failed to mention the head coming loose. The danger of the broken screwdriver blade was well spotted and the fact that it would slip in a screw slot. Most candidates missed the fact that the chuck key had been left in the chuck and the danger it posed if the machine was switched on.

- (ii) This question was not well answered. Most candidates suggested either hammering the nail further into the head of the shaft or screwed the screw down into the shaft. Only a tiny number of candidates mentioned a wedge.

Candidates tried to cut or file the broken part of the tool steel screwdriver blade. This would not work as the only solution was to regrind the tip.

Many candidates left part (c) blank; however a number did offer the solution of pulling down the safety cover. This would be fine in a normal situation but not with a chuck key still in position.

- (b) Only a few higher grade candidates had any understanding of 'set on a saw' or what 'rake and clearance' was on a cutting tool.

Question 13

- (a) Most candidates were able to give two properties for a suitable material, which tended to be waterproof, lightweight, tough, easy to clean, etc.
- (b) Again quite well answered with most giving valid answers to cast iron –will rust, brittle, heavy, etc., and chipboard – not waterproof, will crumble, poor finish, etc. It was polyester resin that caused the problems with most candidates unable to identify its failings.
- (c) Most candidates chose some form of plastic and produced the playing piece by injection moulding. This produced some excellent detailed drawings. Weaker candidates tried to cut the piece from solid material.
- (d) The main solution tended to be a plain solid piece, missing out rounded corners, sloping sides, hollow base, etc.

Question 14

- (a) Once again, most candidates were able to name two suitable properties for the aid. This ranged from hygienic, flexible, tough, colourful, non-toxic, etc.
- (b) This question had answers on lined paper and on drawing sheets.
 - (i) Marking out was not well done; few marked the centre lines or used the correct tools. A number just used a template and pencil.
 - (ii) This part was answered well by most candidates; using a G-cramp, waste wood, correct drill, etc.
 - (iii) Once again quite well answered, with most cutting out while work was held in vice. A number still use a file to cut wood!

Question 15

This was a popular question for candidates. Part (c) in particular was answered well.

- (a) Only a few candidates seemed to understand turning on the lathe and the need to prepare the material first. Some better candidates even suggested the correct cutting tools.
- (b) Those that attempted case hardening failed in the main with many getting confused and explaining how to make the tack lifter.
- (c) This process was well understood with again some excellent detailed drawings.

Question 16

This question was well answered, but some candidates suggest solid material and not sheet.

- (a) Quite well answered with acrylic and aluminium being to two main materials suggested.
- (b)(i) Most used the strip heater method for forming the pocket shape and bending it over a former. A few less able candidates tried to cut it from a solid block.
 - (ii) Quite well answered with most using some form of tenso cement for joining. A number tried to screw the two parts together.
- (c) In the main some good ideas for improving the access for cleaning, slots, openings, doors, etc.

Question 17

Another popular question for candidates.

- (a) Most managed to identify the design improvements and possible reasons for the change.
- (b) A wide range of answers to the axle problem, with most giving a c- type bracket screwed to the board or drilling the foot board and axle. Some tried to weld the axle to the board. A few candidates tried to drill the thin section of the footboard.
- (c) All seemed able to suggest an improved handle grip system, with added rubber grips the most popular.

Question 18

Quite popular being the last question.

- (a)(i) Candidates did not fully understand the need for lightness in the roller. Most got the lifting of the arm to reach high walls, but failed to mention that the roller would get heavier with the added paint.
- (ii) Once, only part of the reason was given in that the paint may be water based. Few mentioned that the roller would need to be cleaned with water at some stage.
- (b) A number of solutions offered for making the roller body, some suggested injection moulding others used the strip heater. Most gave quite reasonable answers with only a few details missing.
- (c) Higher grade candidates gave first class answers earning maximum marks. Many less able did not attempt this section or just suggested putting a nut on the end.

<p>Paper 6043/02 Design Project</p>

General comments

Candidates interpreted the theme **Supporting Learning** in a variety of ways and outcomes included: teaching aids on closed and open circuits; volcanoes; weather patterns; multiplication; spelling and punctuation as well as different types of puzzle and a surfboard balance training aid.

The majority of design folders were set out well and tended to follow the order of the assessment criteria. This together with an accurate list of contents helped the process of moderation.

Most candidates had clearly become very involved and interested in their Design and Technology Project resulting in some work of an extremely high standard indeed.

Comments on Individual Assessment Criteria

The folio

General analysis of topic

Generally, candidates made a thorough analysis of the theme and this resulted in a range of potential design problems in most cases. Candidates seemed to have few problems linking the theme to their own experiences and this gave the work more meaning.

Some candidates put a considerable amount of time into this section of the folder almost at the expense of other important areas. The mark allocation across the assessment headings should give some idea of the amount of time to be given to each.

Design brief and specification

Most candidates wrote a clear brief and this left no doubt in the readers' mind as to the direction of the project. It is pleasing to report that specifications are becoming more focused with sound qualifications and there are fewer cases of generic statements such as 'must be safe' being used.

Exploration of ideas

Most candidates had a good balance between sketches and annotation so that ideas moved in a variety of directions and gave clear detail. Some candidates were very creative indeed, giving themselves the opportunity to consider a whole range of different design ideas. These candidates deserve to be congratulated on the quality and variety of their ideas.

Detailed development of proposed solution

There were some very good examples of candidates considering all aspects of form, materials and constructions in the development of their chosen idea. These choices were supported by sound reasoning indicating that candidates had a sound knowledge and understanding of these aspects of Design and Technology.

This section should conclude with some form of working drawings from which a skilled person could make the artefact.

Suitability of chosen materials and constructions

Marks can be awarded in this section only where candidates have given sound reasons for their choice of materials and constructions in the previous section.

Production planning

There is no need for candidates to describe in detail the basic stages of manufacture such as marking out and preparation of materials. However, they should set out the more complex tasks or any processes that are new to them.

This should be alongside an overall sequence plan so that the order of important stages is clearly set out. In some cases this was linked to specific dates and indicated where the schedule had not been met.

Candidates should not fall into the trap of producing this section as a record or diary of what has already happened, as this approach cannot be awarded high marks.

Communication

The standard of drawing and other communication techniques was very high indeed and folders were generally neat and easy to follow. Candidates had clearly paid particular attention to this aspect of their work and should be congratulated on the successful outcomes.

The artefact

Suitability of proposed solution

Most artefacts appeared to function successfully and there were few examples of unfinished work. It is important that Centres use the full range of marks where appropriate so that fair discrimination between candidates can be maintained.

Workmanship

There were examples of some very high quality products indeed, indicating that many candidates have developed sound making skills. It is reassuring to see that candidates can be discerning in this respect so that outcomes are well finished and operate as intended.

Some products were indeed innovative, indicating that these candidates had achieved much from their Design and Technology course of study.

Photographic evidence of artefacts was as required by CIE and this was very helpful to the Moderator.

Evaluation

As was observed last year, this section of design folders continues to improve indicating that candidates now have a better understanding of the importance of real testing leading to meaningful evaluation. Most evaluations took account of the original design specification and these were considered carefully and given objective comment.

Where candidates observed faults in their designs then modifications or alternative approaches were normally suggested.