DESIGN AND TECHNOLOGY

Paper 6043/01

Paper 1

General Comments

This year the performance of candidates was a little below last year's improved standard, with many candidates failing to give real details in answer to the process questions. Once again a number of candidates failed to read questions correctly, spending a great deal of time and energy giving completely wrong answers to questions of their own making. In the main the graphics are still good and are used well. ***Section A*** was well attempted but not up to the standard of last year. **Question 11** proved to be the most popular question with candidates, who showed good understanding of marking out tools. **Question 12** proved the least popular.

Details

Part A

Question 1

Most candidates scored highly on this question and produced good sketches of the two marking out tools.

Question 2

A well answered question with reasons such as waterproof, easy to clean, colourful, lightweight, etc, for the plastic bathroom blind pull.

Question 3

Very few correct answers to meaning of 'annealing' when applied to metal. This is a basic technique which should be understood by candidates.

Question 4

Only a few correct answers to knock down fitting; some however were able to say it was for joining furniture.

Question 5

Once again few correct answer for the Flow Chart.

Question 6

In the main only water was offered as the answer to cooling plastic as it was machined. Compressed air, soluble oil and paraffin were all missed.

Question 7

Quite a well answered question with most candidates able to identify that pine would weather and rot if unprotected. Paint and varnish were correctly given as the main ways of protection.

Question 8

This was not very well answered as few candidates were able to explain 'draw filing', i.e. the process of carefully removing all the surface marks from a piece of metal by drawing a fine file across it.

Question 9

Most candidates were able to name the correct protection for each of the workshop situations.

Question 10

Many did not understand the material at all and failed to explain the difficulty in marking out or the correct tool to cut the shape. This plastic just crumbles when a pen or pencil is used on it.

Part B

Section 1 – Tools and Materials.

Question 11

Very popular and quite well answered.

(a) Most candidates able to identify the three tools-
A Odd Leg Callipers
B Marking Gauge
C Dividers.
There were a few misunderstandings in naming, such as **B** a mortice gauge, and **C** a compass. A large number of candidates got the purpose wrong for **A** stating it was for drawing circles.

(b) Few gained full marks in this section; most were able to show the tool in action, but not how it was set up with a ruler and adjusted.

(c) Very few correct answers were seen for the surface plate. However better understood the sliding bevel and its purpose.

Question 12

Only a few candidates attempted this question.

(a) Most candidates able to explain the benefits of a 'Template', used for complex shapes, best use of space, saves time, etc.

(b) 'Pattern' seemed to confuse a number of candidates and they repeated the same details as a 'Template'. Few used the example of a casting pattern.

(c) The 'Former' was better understood than 'pattern' and its benefits were frequently well explained with a number of good sketches and drawings.

(d) Only a few explained the purpose of a 'Jig', with locating the drilling position of holes or exact position bending being the best answers.

(e) The 'Mould' seemed to be confused with a pattern by a number of candidates. Better candidates used sand or metal moulds as examples; others used the two part mould in injection moulding.

Question 13

Quite a popular question with candidates.

(a) A good response by candidates to this first section with most able to give a valid reason for selecting and rejecting each material.

(i) Brass was given as having a good colour, ductile, non rusting, quite easy to work, its faults being, heavy, having sharp corner's, may discolour, etc. A number of less able candidates stated that it would rust!

(ii) Teak was given as having an attractive grain and colour, natural oil, very durable, hard and strong, etc. Against, blunts tools, difficult to glue, etc.

(iii) Acrylic gave rise to quite a range of reasons for selection, range of colours, may be clear, easily machined, easy to clean, etc. Against being brittle, easily scratched, etc.

(b) (i) Few candidates really understood the method of using heat on brass to form the handle. Most gave a forging method of heating to red heat and hammering to shape, instead of simply annealing the metal.

(ii) A number of candidates did explain the steaming of timber to form the shapes when softened, poor answers included using heat.

(iii) Most candidates were able to explain the use of a strip heater or oven to soften acrylic before bending.

(c) (i) Most answers gave the reason that the covering paper on acrylic was to stop it being scratched. Few mentioned the advantage of marking out design shapes on its difficult surface.

(ii) There were very few correct answers on the use of pumice powder: many suggested it was to stop rusting. The simple reason was to clean the surface of the metal.

(iii) Only a small number of correct answers were seen and most thought it was a water protection solution.

Section 2 - Processes

Question 14

One of the most popular questions on the paper, giving the candidates a chance to show their graphic skills.

(a) Candidates were well able to suggest a suitable material for the butterfly brooch and give a valid reason. The materials suggested included MDF, teak, silver, aluminium, acrylic, polythene, etc., all of which would have been suitable. Main reasons given were colour, weight, finish, ease of production, etc.

(b) The process of marking out and cutting the brooch shape was poorly described. Many of the answers were vague, lacking in real details of tools, methods of holding, etc. Large numbers of candidates used the wrong tools for the material chosen; tools such as a tenon saw or hacksaw will not cut a curve shape.

(c) (i) There were some excellent design sketches for surface of the wings.

(ii) A number of good ideas on how to apply the design to the brooch wings were seen, such as using a template and then spray painting, burning the design on timber with a hot soldering iron, etc.

Question 15

This was another popular question in which candidates performed quite well.

(a) (i) All were able to suggest a suitable material for the sign such as aluminium, teak, acrylic, etc. A few candidates suggested steel, which would do the job provided it was protected.

(ii) This part-question was not well answered, with many candidates just stating the it would be ‘cut out’ or ‘formed’. Better candidates suggest injection moulding, vacuum forming or casting.

(b) Those candidates who suggested a valid system in **(a)** gained high marks with well described manufacturing methods, the most popular being injection moulding, with sand casting a near second. Many tried to make it from solid wood but failed to give much detail. Others tried to build it up from parts, which would have been quite valid, but again failed to give sufficient information.

(c) Many candidates just bolted or screwed the sign to the pole, so it could not be moved in a horizontal position as asked in the question.

The best answers involved C curved bracket and fixing, with an adjustable locking screw. One clever candidate suggested a spiral slot with a locking screw, so that the sign could be moved in any horizontal position.

Question 16

This was not a popular with candidates unless they understood two of the three processes.

(a) Only a small number of candidates had any knowledge of the silver soldering process; most seemed to think you used a soldering iron. Others had used flux and thought that this on its own would form a joint.

(b) In this part of the question candidates mixed up the bridle joint with a mortice and tenon joint. Some better answers used drawings to give real details of the two joint parts, tools, holding, etc.

(c) In this section weaker candidates mixed up press forming with compression moulding, using a powder instead of a sheet material. Better answers gave details of the male and female moulds, oven, heated acrylic sheet, handling, etc.

Question 17

Quite a popular question

(a) The use of tracing in design work was not well explained.

(b) Most were able to give one property for a suitable material such as transparent, but failed to identify 'clear', easy to clean, not easily broken, etc.

(c) Again the process of making the two ends was not well described, with much of the detail missing, such as stages, tools, holding material, etc. The ends needed to be worked as a pair and the slot ends needed to be drilled before any cutting.

(d) Some excellent design ideas were given for joining the two ends of the support stand, from rods, bars, solid bases, front and back rails, etc. These were fixed with screws, nails, glue, etc.

Question 18

Not a popular question.

(a) (i) Well answered by those who attempted the question ,with many gaining full marks. The process details included the die, die holder, vice, oil, angle, turning actions, etc.

(ii) Many candidates failed to work the two plates together for drilling alignment. All had the work clamped to the table with waste support, the drill action, etc.

(iii) Mainly poor answers to this section with most just using a file for producing the rounded corners.

(b) Quite a number of wing nut answers, but most candidates gave the wrong answer of a hexagonal nut. Some weaker candidates misunderstood the question and suggested spanners.

Conclusion

Poor descriptions in simple processes such as marking out, drilling holes or cutting a joint are letting candidates down. Sketching and graphics continue to be good but must be applied to the correct answers. Little is gained if the wrong processes or tool is described, no matter how good the detail.

Injection moulding is one process that continues to be well understood and described. Metalwork knowledge however seems to be a weak area for many candidates, which showed up in **Questions 3**, **8**, and **13**. Draw filing metal, silver soldering and the use of pumice powder to clean brass are basic workshop practices.

Once again the hacksaw was suggested for cutting wood, and Centre punching acrylic. I must repeat what was said in the last report that practical workshop experience should be the base on which other technical knowledge is built. Candidates need to experience the three major materials in a workshop environment.

DESIGN AND TECHNOLOGY

Paper 6043/02
Design Project

General comments

The theme **Transporting** seemed to be popular with candidates and they responded to it in a very positive way. Naturally, many of the situations and artefacts considered in the analysis of the topic were those with which young people would be particularly familiar in their normal day to day lives.

Made artefacts varied enormously and interesting products included: animal and bird carriers; tool boxes; various food carriers including those for cakes, sushi and snacks; school 'bags'; portable seating; luggage; farm tool carrier; stationary carrier; fishing kit; ball carrier etc.

Comments on individual Assessment Criteria

The Folio

General Analysis of Topic

Many candidates spent a long time on this section of their design folders and they had few problems in the identification of artefacts and design situations linked to the theme. A wide range of transportation situations was evidenced and considered by most candidates and they then had a clear path to the identification of their own design problem.

Formulation of Design Brief and Specification

Design briefs were generally clearly written so that it was obvious to the reader of the folio what was to be made.

As has been reported before, design specifications have improved and most candidates were able to offer a range of meaningful points giving them access to the higher mark bands. It is pleasing to see that most points were specific to the design problem and qualified or quantified as necessary.

Exploration of Ideas

Many candidates need to be congratulated, not only on the range of ideas considered, but also on the innovation and creativity shown for this level of examination. Designs attracted interest from the reader and many were described very well through the sound use of clear annotations and explanations. It is reassuring to see that some of the more unusual ideas go forward for development, as should be the case.

Detailed Development of Proposed Solution

The majority of candidates were able to develop their chosen idea(s) to a fairly advanced stage and to provide information and drawings from which the product could be made by a skilled person. It is important that candidates not only make decisions and choices, but give the reasons for these by offering and considering alternatives. There were fewer cases of candidates filling this section with irrelevant information on materials, constructions and fittings as has sometimes been the case in previous years.

Suitability of Chosen Materials and Construction

This section is linked to the previous one and high marks can only be awarded where candidates have given reasons for their choices of materials and constructions.

Production Planning

Many plans were very easy to follow and it was obvious that most candidates were aware of the basic sequences for the manufacture of their product. It is always good to see an overall order of events, perhaps linked to dates or time in some way, supported by more detailed information on some of the less familiar or more complex tasks to be carried out.

Communication

The quality of communication, particularly graphic skills was very high indeed. This made design folders straightforward to read and candidates' thought processes easy to follow. The Moderator is particularly impressed by this aspect of candidates' folios.

The Artefact

Suitability of Proposed Solution

Most of the products appeared to function as intended although it is always difficult to make a judgement from photographic evidence alone. Centres seemed to be using the full range of marks to discriminate between candidates.

Workmanship

Design folios included, or were accompanied by, good photographic evidence of made products and it was pleasing to see that many candidates had taken a great deal of care in the manufacture of their design solution. A wide range of making skills was in evidence and candidates had generally used appropriate materials and construction techniques.

The Moderator is pleased to see that so many candidates have achieved a good balance between design folios and made artefacts to the extent that performance is normally at or about the same level in both.

Evaluation

This section of design folios continues to improve and it is no longer the weak area for most candidates. Centres are reminded of the strong link between Specifications and Evaluation, so that if the former is not complete then it is difficult to carry out meaningful testing and evaluation.