



General Certificate of Education

Design and Technology: Product Design (3-D Design) 1551

PROD1 Materials, Components and Application

Report on the Examination

2010 examination – June series

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General

The format of this paper is now well established and centres are preparing candidates well. The majority of candidates were able to attempt all questions and complete the paper as expected.

Generally candidates completed the answer booklets correctly but there were still a significant number of candidates who either wrote outside of the answer spaces or completed additional sheets. This additional work was often unnecessary and did not lead to further marks.

There seemed to be a number of scripts that were very difficult to read either through the use of extremely small or untidy hand writing. Centres are advised to make appropriate arrangements for candidates who display such handwriting in preliminary assessments.

Section A

Question 1

- (a) Answers to this question were very mixed with a significant number of candidates unable to correctly identify three ferrous and three non-ferrous metals. Often the answers to ferrous metals were generic 'steel' and 'iron'.
- (b) (i) Almost all candidates gave a correct application for one of the metals but again answers were sometimes not very specific e.g. "mild steel is used in buildings".
- (ii) Most candidates correctly gave two relevant properties to explain the suitability of the metal for the applications that they gave. The better answers offered a little explanation rather than just the basic properties.

Question 2

- (a) Almost all candidates did well and correctly named a man-made board and a use for it.
- (b) This question provided a mixture of answers. At a basic level, some gave simple one or two word answers e.g. 'they are stronger', 'cheaper', 'can be made quickly'.

The better answers wrote in fuller sentences explaining the relevance of the board to the product.
- (c) Candidates gave good answers for the FSC timber with the majority recognising that the logo had something to do with sustainability and replanting trees to replace those cut down. In approximately one third of answers candidates gave the full name Forest Stewardship Council.

Question 3

This was generally well answered with most candidates matching all four compliant materials to the correct application. Only a relatively small number got it completely wrong.

Section B

Question 4

The format of this question and the spaces made available in the answer booklet seemed to have made it very accessible to candidates but in many cases as a response, they have given simplistic answers. For future examination series, this type of question will be modified to have fewer materials listed and a greater level of detail required in the answer.

(a) Carbon Fibre Reinforced Polymer- Tennis Racquet

The most popular answer was 'strong' and 'lightweight'. Most candidates explained that tennis racquets have to be strong to withstand continuous impacts from the ball; a little obvious but nevertheless correct. The explanation of the relevance of 'lightweight' was often very poor, with vague descriptions along the lines of 'it makes it easier to play with'.

(b) Concrete- Garden Ornament

This was fairly well answered with lots of references to weather resistance and density/weight which helps to stop the product being blown over.

(c) Liquid Silicon Rubber (LSR)- Mobile Phone cover/skin

This was well answered with the majority of candidates describing the elastic properties and how this is needed to fit the cover to the phone and good references to texture for good grip, method of making, etc.

(d) Beech- Chopping board

Answers to this question were basic and obvious ('strong because food will be constantly chopped on it'). Again, the terminology used by candidates was often vague.

(e) Titanium-Wrist watch strap and casing

Many candidates made reference to 'aesthetically pleasing' which is a fairly obvious point given the nature of the product. Better answers recognised properties such as hardness and the corrosion resistant qualities.

Question 5

This was less popular than question 4. Where this question was attempted, responses were generally good. This is perhaps because the material name and method of manufacture were given in the question. This approach seemed to avoid candidates answering inappropriately.

- (a) Most candidates gave three appropriate reasons why LDPE is used in the washing liquid bottle. The best answers described flexibility to squeeze the liquid out, thermoplastic required for the blow moulding process and the recyclable nature of LDPE necessary for a product with such a short lifecycle.
- (b) Where this question was attempted, answers were generally good. In the majority of cases, candidates produced appropriate diagrams with step by step notes. The best answers used very good labelling on their diagrams with correct terminology.
- (c) Candidates struggled to articulate answers but generally gave at least one answer that was correct. Most candidates explained that blow moulding is the most appropriate to make a hollow bottle whilst another popular answer was speed of manufacture.

Section C

Question 6

- (a) (i) Most candidates gave a correct metal for the cup.
- (ii) Answers for this question were very mixed. The best answers referred to things like stainless steel being tough and resistant to impacts with such items being dropped, it does not corrode so it can be cleaned in a dishwasher and so on. There were many confused answers with references to stainless steel or aluminium being a conductor 'so users would not be burned'.
- (iii) This question seemed to have either excellent or very poor responses. The best candidates described punching and then either spinning, or cupping followed by press forming/deep drawing. Diagrams were often very good. Unfortunately many candidates described either die casting or even sand casting, or suggested the cup might have been rolled and seam welded.
- (iv) There were good answers for this question with many candidates giving a suitable thermoplastic. Unfortunately many candidates described thermosets such as urea formaldehyde, melamine formaldehyde and even 'Bakerlite'. Some candidates did not give a polymer but then proceeded to answer the next part. This resulted in giving no marks for both part (iv) and part (b).
- (b) Candidates gave some excellent answers for this question. Many described making the gap between the cup and the handle bigger, and the handle longer to accommodate larger hands. Other answers included the use of TPE sections to improve grip, a larger base to improve stability, modifications to the slide cover to make it easier to open, modifications to the rim to make it easier to drink and so on. Only a few candidates seem to realise how thermos cups function and felt that the stainless steel would be very hot to touch. However, this was not penalised. Generally the diagrams used to support this question were excellent and where they gave additional information, they were given good marks.

Mark Ranges and Award of Grades

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