

General Certificate of Education
June 2008
Advanced Subsidiary Examination



DESIGN AND TECHNOLOGY: PRODUCT DESIGN PD1D
(3-D DESIGN)
Unit 1 Materials and Components

Tuesday 20 May 2008 9.00 am to 10.30 am

For this paper you must have:

- an unlined answer book (7024) which is provided separately
- normal writing and drawing instruments
- a colour Insert Sheet (enclosed).

Time allowed: 1 hour 30 minutes

Instructions

- Use black ink or black ball-point pen. Use pencil and coloured pencils only for drawing.
- Write the information required on the front of your answer book. The *Examining Body* for this paper is AQA. The *Paper Reference* is PD1D.
- Answer **three** questions.
Answer Question 1 and any **two** of Questions 2 to 4.
- Use the Insert Sheet included to help you answer **Questions 1, 3 and 4**.

Information

- The maximum mark for this paper is 100.
Four of these marks will be awarded for using good English, organising information clearly and using specialist vocabulary where appropriate.
- There are 40 marks for Question 1 and 28 for each of Questions 2 to 4.
- The marks for questions are shown in brackets.

Advice

- Illustrate your answers with sketches and/or diagrams wherever you feel it is appropriate.

Answer Question 1.

- 1 (a) Study the photographs on the Insert Sheet provided (**Figures 1–3**).

Choose **two** products from the list below and answer the questions which follow.

- Wooden chair (**Figure 1**)
- Plastic vase (**Figure 2**)
- Metal bottle opener (**Figure 3**)

- (i) Stating the **two** chosen products, name a suitable specific material used in their manufacture. *(2 × 1 mark)*
- (ii) Explain in detail **three** properties that make these materials suitable for each of the **two** products chosen. *(2 × 6 marks)*
- (b) Using notes and diagrams, explain how **two** of the products listed in part (a) above are manufactured. *(2 × 10 marks)*
- (c) Describe **three different** procedures that should be adopted for the safe use of materials in a workshop environment.

In your answer you should make reference to the specific material(s) concerned.

(6 marks)

Answer any **two** questions from 2, 3 and 4.

- 2 For each of the following materials, explain in detail why it is suitable for the product listed.

In each of your answers you should clearly link specific properties of the material to the function and/or manufacture of the product.

Material	Product
(a) Stainless steel	Drinks flask
(b) Pewter	Jewellery
(c) Carbon Fibre Composite	Tennis racket
(d) Laminated glass	Car windscreen
(e) Thermochromic pigment	Thermometer
(f) Corrugated polypropylene sheet	Art carry folders
(g) Expanded polystyrene	Take-away food container

(7 × 4 marks)

Turn over for the next question

Turn over ▶

3 Study the photograph of the metal ornament fabricated from nuts, washers and metal bars (**Figure 4**) on the Insert Sheet provided and answer the following questions.

- (a) (i) Name a suitable specific metal for the part labelled A. *(2 marks)*
- (ii) Explain in detail why this metal would be suitable. *(6 marks)*
- (b) Use notes and diagrams to explain in detail how the ornament could be fabricated. *(10 marks)*
- (c) Name a suitable specific surface finish for the ornament and describe in detail how it would be applied. *(4 marks)*
- (d) If the ornament was to be made in batches of 50, explain how this might be achieved.
- You may use diagrams to support your answer. *(6 marks)*

4 (a) Study the photographs of the two public benches (**Figures 5** and **6**) on the Insert Sheet.

The bench in **Figure 5** is made from recycled Low Density Polyethylene (LDPE), whilst the bench in **Figure 6** is made from teak.

Compare and contrast the materials used in the two benches.

Your answer should refer to the

- function of the product
- methods of manufacture and assembly
- maintenance of the product.

(2 × 12 marks)

(b) Explain why it is necessary to add stabilisers to polymers used in outdoor products.

(4 marks)

END OF QUESTIONS

Insert

Use Figures 1 to 3 to help answer Question 1

Figure 1 Wooden chair



Figure 2 Plastic vase

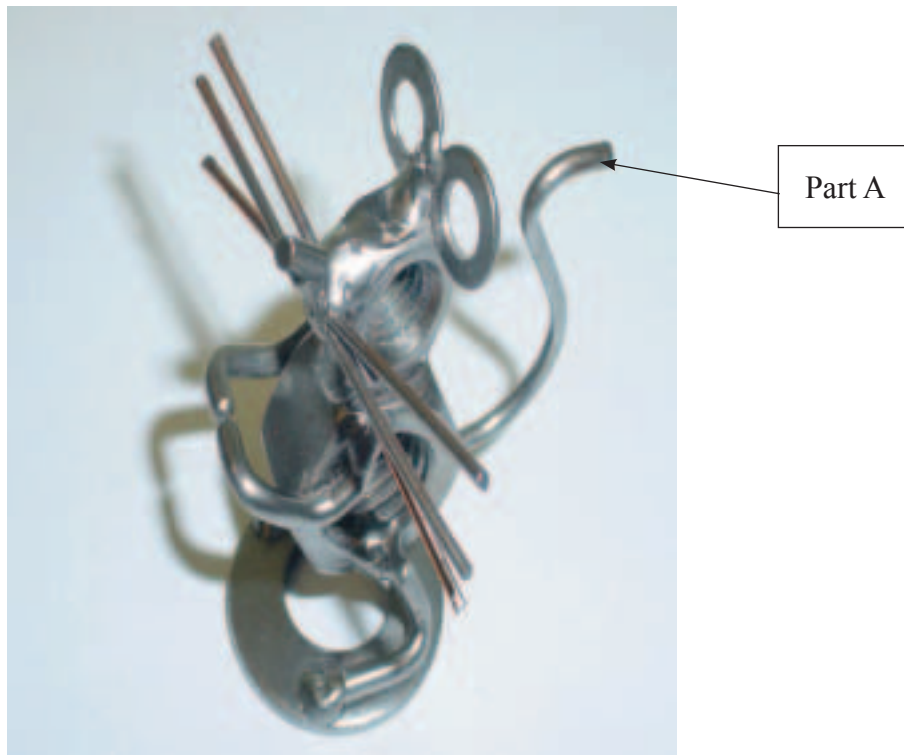


Figure 3 Metal bottle opener



Use Figure 4 to help you answer Question 3

Figure 4 Metal ornament



Use Figures 5 and 6 to help you answer Question 4

Figure 5 Recycled Low Density Polyethylene (LDPE) bench



Figure 6 Teak bench

