

General Certificate of Education
January 2007
Advanced Subsidiary Examination



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

Wednesday 10 January 2007 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 blue or black ink or 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 **two** other questions.
- Use the Insert Sheet included to help you answer Question 1 and Question 4.

Information

- The marks for questions are shown in brackets.
- 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.

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 following questions.

- Wooden stool
- MP3 Player (polymer case)
- Metal bicycle frame

- (i) Stating the **two** chosen products, name a suitable specific material used in their manufacture. *(2 × 2 marks)*
- (ii) Explain in detail what properties make these materials suitable for each of these **two** chosen products. *(2 × 6 marks)*
- (iii) Using notes and diagrams, explain how **two** of the products listed above are manufactured. *(2 × 9 marks)*
- (b) With reference to **one** of the manufacturing methods you have described in part (a)(iii), explain what health and safety measures the manufacturer could take to protect employees. *(6 marks)*

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

- 2 (a) Define what is meant by the term *thermoplastic*. (4 marks)
- (b) Define what is meant by the term *thermoset plastic*. (4 marks)
- (c) For each of the following polymers, explain in detail why they are suitable for the product listed.

Material	Product
(i) Low Density Polyethylene (LDPE)	Carrier bags
(ii) Polyethylene Terephthalate (PET)	Drinks bottles
(iii) Urea Formaldehyde (UF)	Electric light switch
(iv) Melamine Formaldehyde (MF)	Kitchen work surfaces

(4 × 5 marks)

- 3 (a) For each of the following materials, explain why they are suitable for the product listed.

Material	Product
(i) Unbleached recycled paper pulp	Egg boxes
(ii) Corrugated card	Fragile glass packaging
(iii) Expanded polystyrene	Fast food packaging
(iv) Laminated card	Drinks cartons
(v) Glass	Drinks bottles
(vi) Aluminium	Baking foil

(6 × 4 marks)

- (b) Give **two** reasons why manufacturers are trying to reduce packaging in products. (2 × 2 marks)

Turn over for the next question

Turn over ▶

4 Study the photograph of the metal sculpture in **Figure 4** on the Insert Sheet.

- (a) Name a specific metal that could have been used to make the sculpture. *(2 marks)*
- (b) Explain in detail why this material is suitable. *(6 marks)*
- (c)
 - (i) Use notes and diagrams to describe how the silhouette pattern on the sculpture is made. *(9 marks)*
 - (ii) Explain why this method is suitable. *(3 marks)*
- (d) The sculpture requires a finish to protect and enhance it. Use notes and diagrams to describe the finishing materials used and the method of application. *(8 marks)*

END OF QUESTIONS

Insert

For use with Questions 1 and 4

Figure 1 Wooden stool



Figure 2 MP3 Player (polymer case)



Figure 3 Metal bicycle frame



Figure 4 Metal sculpture

