

General Certificate of Education
January 2008
Advanced Subsidiary Examination



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

Wednesday 9 January 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 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 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.
- The marks for questions are shown in brackets.
- There are 40 marks for Question 1 and 28 marks 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 questions which follow.

- Plastic watering can
 - Alloy wheel
 - Softwood table
- (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** chosen products. *(2 × 6 marks)*
- (b) Using notes and diagrams, explain how **two** of the products listed in part (a) are manufactured. *(2 × 10 marks)*
- (c) Explain why, in comparison to softwood, hardwoods are becoming less popular with designers and manufacturers. *(6 marks)*

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

- 2 (a) For **each** of the following name a suitable adhesive to join the materials together.
- (i) Acrylic to acrylic
 - (ii) Softwood to softwood
 - (iii) Melamine formaldehyde to MDF (Medium Density Fibreboard)
 - (iv) Steel to nylon. *(4 × 1 mark)*
- (b) Use notes and diagrams to describe in detail **two** specific knock-down fittings and explain how they are used to join materials together. *(2 × 7 marks)*
- (c) Explain the advantages of using knock-down fittings for **both** the manufacturer and the consumer. *(6 marks)*
- (d) Explain why self-tapping screws are often used to assemble products. *(4 marks)*
- 3 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) ABS (Acrylonitrile Butadiene Styrene)	Mobile phone
(b) Acrylic	CD Rack
(c) MDF (Medium Density Fibreboard)	Storage unit
(d) Laminated Plywood	Cantilever chair
(e) High Speed Steel	Drill bit
(f) Aluminium Sheet	Car body panel
(g) Foamboard	Architectural model

(7 × 4 marks)

Turn over ▶

4 Study the CAD (Computer Aided Design) drawing of a torch (**Figure 4**) on the Insert Sheet provided and answer the following questions.

Materials have not been rendered onto the drawing.

- (a) Before putting the torch into production, the CAD drawing needs to be made into a **physical model**.
- (i) Name a suitable material that could be used to make a physical model of the torch. *(2 marks)*
 - (ii) Using the material you have named in part (i), use notes and diagrams to explain how a physical model of the torch could be made. *(10 marks)*
- (b) Having made a model, a working prototype is to be made.
- (i) Name a material that would be suitable for Part A (the body). *(2 marks)*
 - (ii) Explain **in detail** why this material would be suitable. *(6 marks)*
 - (iii) Name a material that would be suitable for Part B (the lens cover). *(2 marks)*
 - (iv) Explain **in detail** why this material would be suitable. *(6 marks)*

END OF QUESTIONS

Insert

For use with Questions 1 and 4

Figure 1 Plastic watering can

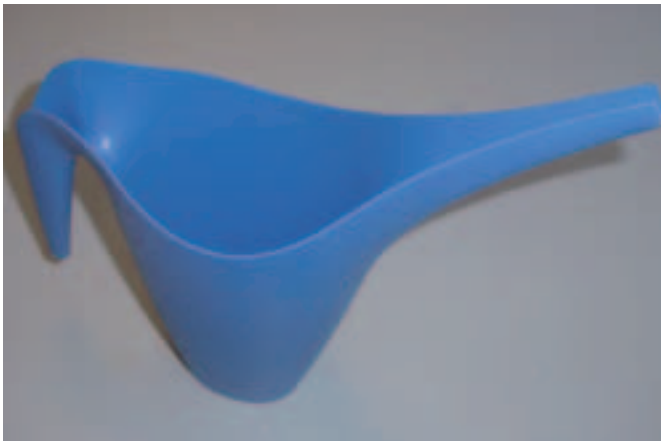


Figure 2 Alloy wheel



Figure 3 Softwood table



Figure 4 CAD (Computer Aided Design) drawing of a torch

