



General Certificate of Education
Advanced Level Examination
June 2011

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

PROD3

Unit 3 Design and Manufacture

Thursday 23 June 2011 1.30 pm to 3.30 pm

For this paper you must have:

- an AQA 12-page unlined answer book which is provided separately
- normal writing and drawing instruments
- an Insert Sheet.

Time allowed

- 2 hours

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 PROD3.
- Answer **three** questions.
- Answer **one** question from each of Sections 1 and 2 and **one** other question from either section.
- Do all rough work in your answer book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 84.
- You will be marked on your ability to:
 - use good English
 - organise information clearly
 - use specialist vocabulary where appropriate.

Advice

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

Answer **three** questions.

Answer **one** question from each of Sections 1 and 2 and **one** other question from either Section.

Section 1

Question 1

| | |
|---|---|
| 0 | 1 |
|---|---|

 Study the photographs of the two chairs on the Insert Sheet.

- **Figures 1 – 3** Lounge chair (designed by Charles and Ray Eames in 1956)
- **Figures 4 – 6** Barcelona chair (designed by Mies van der Rohe in 1929)

In each case explain how the designer has made use of specific materials in order to achieve the form and aesthetics of the chair. (2 x 14 marks)

Question 2

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|---|---|
| 0 | 2 |
|---|---|

 Select **one** of the following and explain in detail the ergonomic features and anthropometric information which should be considered in order to ensure that it is both safe and efficient for the user.

- a domestic kitchen
 - a car interior
- (14 marks)

| | |
|---|---|
| 0 | 3 |
|---|---|

 Legislation and regulation have been introduced in order to limit the effects of consumer goods upon the environment. Explain what impact these have had on **two** of the following:

- packaging
 - energy use
 - end of use disposal.
- (2 x 7 marks)

Question 3

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|---|---|
| 0 | 4 |
|---|---|

 Many materials degrade due to environmental conditions and so certain products have a protective barrier applied.

For **each** of the following explain how they degrade. In each case describe a suitable finish and explain how it could be applied in order to provide the necessary protection.

- Hardwood garden furniture
 - Mild steel climbing frame
 - Aluminium bicycle wheels
 - Card drinks carton
- (4 x 7 marks)

Section 2

Question 4

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|---|---|
| 0 | 5 |
|---|---|

Using specific examples, explain when and why a manufacturer may make use of **four** of the following processes:

- Laser cutting
- Offset lithography
- Rapid prototyping
- Die casting
- Injection moulding
- Calendaring.

(4 x 7 marks)

Question 5

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|---|---|
| 0 | 6 |
|---|---|

Function, aesthetics and originality may be considered to be aspects of good design which a product should include if it is to be successful.

Describe a product which you believe to be of a *good design* and explain how it satisfies the criteria above. (14 marks)

| | |
|---|---|
| 0 | 7 |
|---|---|

Many products require re-design or modification to suit the specific needs of consumer groups such as the elderly or those with a disability.

With reference to a specific product, explain the changes which could be made in order to suit the needs of a specific consumer group.

Use diagrams where necessary. (14 marks)

Turn over for the next question

Turn over ►

Question 6

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|---|---|
| 0 | 8 |
|---|---|

A number of systems are used in manufacturing to ensure that products are produced efficiently, accurately and on time for the customer.

With reference to a specific industry, describe the methods which may be used to ensure the correct supply and quality of the product to meet customer demand. *(18 marks)*

| | |
|---|---|
| 0 | 9 |
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Describe the process you employed in the design and development of your coursework project to ensure a quality outcome that met your original design brief. *(10 marks)*

END OF QUESTIONS