

A-level

DESIGN AND TECHNOLOGY: PRODUCT DESIGN (3-D DESIGN)

Unit 3 Design and Manufacture

Friday 9 June 2017

Morning

Time allowed: 2 hours

Materials

For this paper you must have:

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

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 **Paper Reference** is PROD3.
- Answer **three** questions.
- Answer **one** question from **each** of Sections 1 and 2 and **one other** question from **either** section.
- If you choose to answer a question which has several parts, you should answer **all** parts of the question.
- 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.
- There are 28 marks for each question.
- 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.

For each question that you answer, you should answer **all** parts of that question.

Section 1

Question 1 Answer all parts of this question.

0 1 **Figures 1** and **2** show a welded mild steel chair frame.

Describe how the design would need to be changed to allow the product to be sold in flat pack form.

Use diagrams to support your answer.

[12 marks]

Figure 1
Complete chair



Figure 2
Chair frame only



0 2 **Figure 3** shows a mass-produced jigsaw puzzle.

Explain how a manufacturer could ensure quality in a batch of 100 000 identical jigsaw puzzles.

In your answer you should refer to:

- a suitable manufacturing method
- quality assurance.

[10 marks]

Figure 3



0 3 Describe in detail a suitable manufacturing method for a one-off bespoke jigsaw design.

You may use diagrams to support your answer.

[6 marks]

Question 2 Answer all parts of this question.

0 4 Discuss how designers have combined function and aesthetics to achieve successful products.

Refer to specific products in your answer. Use diagrams to support your answer.

[14 marks]

0 5 Explain how designers and manufacturers can protect their designs from being copied.

Use specific examples in your answer.

[8 marks]

0 6 Describe how legislation is used to protect consumers from purchasing potentially dangerous or faulty goods.

Use specific examples in your answer.

[6 marks]

Turn over ►

Question 3 Answer all parts of this question.

0 7 **Figures 4** and **5** show two different forms of detergent packaging.

Compare the materials used for both products **and** justify their selection.

[10 marks]

Figure 4



Figure 5



0 8 Discuss how electrical consumer goods have been designed in order to make them more energy efficient.

[12 marks]

0 9 Discuss the environmental issues associated with the use of polymers in product manufacture.

[6 marks]

Section 2

Question 4 Answer both parts of this question.

1 0 An electric hedge trimmer is shown in **Figures 6 to 8**.

Explain how the designer has tried to reduce the risk to a person using the hedge trimmer.

In your answer you should refer to specific safety features.

[16 marks]

Figure 6



Figure 7



Figure 8



1 1 Explain how manufacturers use modern manufacturing systems to adapt to changes in customer demand.

Use specific examples in your answer.

[12 marks]

Turn over ►

Question 5 Answer both parts of this question.

1 2 Explain in detail why concrete is suitable for use in the car park stairway shown in **Figure 9**.

In your answer you should refer to:

- material properties
- manufacturing techniques.

[12 marks]

Figure 9



1 3 Explain how a designer would make use of each of the following during the design process:

- focus groups
- flowcharts
- specification
- rapid prototyping.

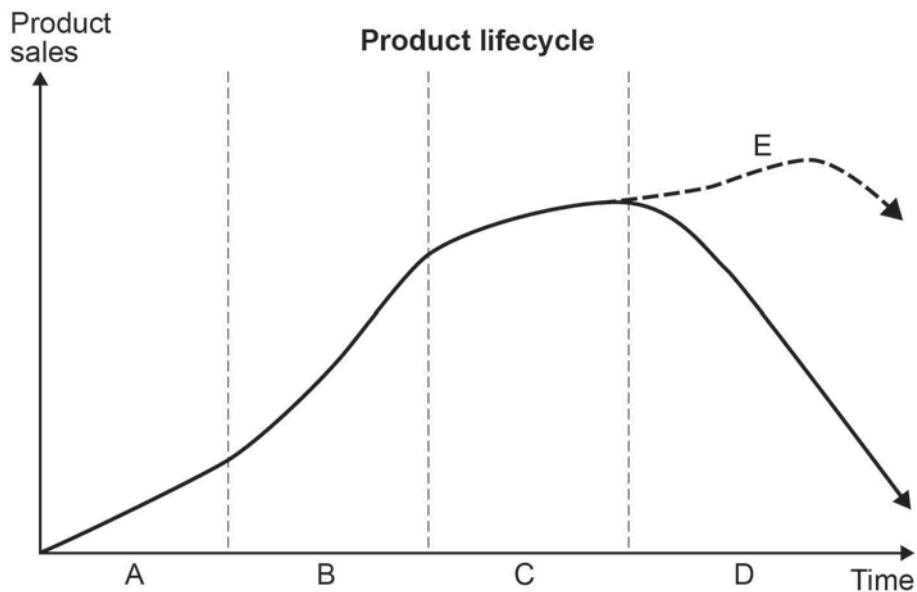
[4 x 4 marks]

Question 6 Answer both parts of this question.

1 4 The graph below shows the main stages of a product life cycle.

Explain each of the phases, A to E, shown on the graph.

[10 marks]



1 5 With reference to a specific product, explain how designers have developed the product to ensure continued retail success.

In your answer you should refer to:

- developments in technology
- planned obsolescence.

[18 marks]

END OF QUESTIONS

Turn over ►

There are no questions printed on this page

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