

Write your name here

Surname

Other names

**Pearson**  
**Edexcel GCE**

Centre Number

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# Design and Technology

**Product Design: Resistant Materials Technology  
Advanced**

**Unit 3: Designing for the Future**

Friday 10 June 2016 – Morning

**Time: 2 hours**

Paper Reference

**6RM03/01**

**You do not need any other materials.**

Total Marks

## Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches it must be dark (HB or B). Coloured pens, pencils and highlighter pens must **not** be used.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*

## Information

- The total mark for this paper is 70.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (\*) are ones where the quality of your written communication will be assessed  
– *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

## Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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P 4 6 4 0 3 R A 0 1 1 6

**PEARSON**

Answer ALL questions. Write your answers in the spaces provided.

1 Figure 1 shows a chair that uses a laminate construction for the frame.



(Source: Bruno Mathsson, Eva Chair, 1934)

**Figure 1**

(a) (i) Give **four** advantages of using a laminate construction, compared to a solid wood construction, for the frame of the chair.

(4)

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2 Automated storage and retrieval systems (ASRS) are used in industry.

(a) Explain **two** advantages of using an automated storage and retrieval system (ASRS).

(4)

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(b) (i) Draw a flow chart to represent a closed loop system.

(2)

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3 (a) Outline the negative effects mass-production has had on employment.

(4)

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4 Companies try to reduce the environmental impact of a product at all stages of its life cycle.  
Give **two** environmental considerations for each stage.  
An example answer is already given for raw materials.

(10)

| Life cycle stage | Environmental considerations   |
|------------------|--|
| Raw materials    | Example answer: Use a smaller quantity of material in the production of a product.<br>1 .....<br>.....<br>2 .....<br>..... |
| Manufacture      | 1 .....<br>.....<br>2 .....<br>.....   |
| Distribution     | 1 .....<br>.....<br>2 .....<br>.....   |
| Use              | 1 .....<br>.....<br>2 .....<br>.....   |
| End of life      | 1 .....<br>.....<br>2 .....<br>.....   |

(Total for Question 4 = 10 marks)





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**\*5** Evaluate the use of a flexible manufacturing system, compared to dedicated automated machinery, in production.

(10)

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(Total for Question 5 = 10 marks)



6 Art Nouveau or 'new art' was an international design movement that developed in the late 19th century.

(a) Using examples, explain **three** design characteristics found in Art Nouveau designs.

(6)

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(b) Figure 2 shows an example of a bar stool that has been designed in the Art Nouveau style.



(Source: © Michael Stolworthy)

**Figure 2**

Discuss how the designer considered both form and function when designing the bar stool.

(4)

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(Total for Question 6 = 10 marks)



\*7 Evaluate the use of robots in automated manufacturing systems.

(10)

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(Total for Question 7 = 10 marks)

**TOTAL FOR PAPER = 70 MARKS**

