

Write your name here	
Surname	Other names
Centre Number	Candidate Number
Edexcel GCE	
<h1>Design and Technology</h1> <h2>Product Design: Graphic Products</h2> <h3>Advanced</h3> <h3>Unit 3: Designing for the Future</h3>	
Friday 25 June 2010 – Morning Time: 2 hours	Paper Reference <b>6GR03/01</b>
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.
- Keep an eye on the time.
- Try to answer every question.

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Turn over ►

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

**1** Ergonomics and anthropometrics are essential considerations in the design of a product.

(a) Explain why designers have to exclude a percentage of a defined user group.

**(2)**

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(b) Discuss why it is beneficial to consumers that designers consider ergonomics during the design process.

**(6)**

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(c) (i) Figure 1 shows a chair used in schools.



**Figure 1**

Evaluate how the designer has considered **form** and **function** as part of the design criteria of the school chair in Figure 1.

(4)

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(ii) Figure 2 shows a Charles Rennie Mackintosh chair.



**Figure 2**

Evaluate how the designer has considered **form** and **function** as part of the design criteria of the Charles Rennie Mackintosh chair in Figure 2.

(4)

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(Total for Question 1 = 16 marks)



2 Sustainable environmental development relies upon the application of cleaner designs and technologies on the life cycle of products.

(a) Explain what is meant by the term 'carbon footprint'.

(2)

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(b) Describe **two** advantages and **two** disadvantages of using biofuels instead of fossil fuels.

(8)

Advantage 1 .....

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Advantage 2 .....

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Disadvantage 1 .....

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Disadvantage 2 .....

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(c) Describe **two** ways in which the Kyoto Protocol could help reduce global warming. (4)

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(d) The ability to recycle materials and products is an aspect of life cycle assessment.

Describe **two** problems associated with recycling paper. (4)

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**(Total for Question 2 = 18 marks)**



\*3 Digital special effects are increasingly being used in film making.

Describe the process of using blue/green screen technology in creating digital special effects.

(6)

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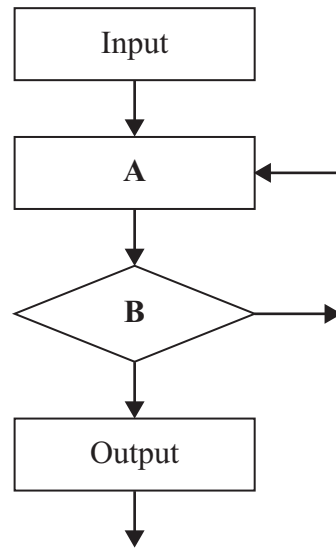
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**(Total for Question 3 = 6 marks)**



4 (a) Figure 3 shows a control system.



**Figure 3**

(i) Name the type of control system shown in Figure 3.

(1)

(ii) State the purpose of box A.

(1)

(iii) Explain the purpose of box B.

(2)





(b) Explain what is meant by the term 'artificial intelligence'.

(3)

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(c) Discuss the benefits of using computer-aided quality (CAQ) in the manufacturing process.

(5)

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(d) Describe **three** characteristics of quick response manufacturing (QRM).

(6)

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**(Total for Question 4 = 18 marks)**





