

Write your name here	
Surname	Other names
Centre Number	Candidate Number
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<b>Edexcel GCE</b>	
<h1>Design and Technology</h1> <h2>Product Design: Resistant Materials Technology</h2> <h3>Advanced</h3> <h3>Unit 3: Designing for the Future</h3>	
Thursday 23 June 2011 – Afternoon <b>Time: 2 hours</b>	Paper Reference <b>6RM03/01</b>
<b>You do not need any other materials.</b>	Total Marks
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#### 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.
- Check your answers if you have time at the end.

Turn over ►

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

**1** Electronic communication is an essential element of modern business practice.

(a) Give **three** advantages to a business of using email compared with telephone communication systems.

(3)

1 .....

2 .....

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3 .....

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(b) Describe **four** benefits to a business of using the internet as a marketing tool.

(4)

1 .....

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2 .....

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3 .....

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4 .....

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**(Total for Question 1 = 7 marks)**



2 (a) Choose **two** of the following additives and explain how they improve the properties of polymers.

- Fibres
- Stabilisers
- Foamants

Additive 1 .....

(4)

Additive 2 .....

(b) Explain **two** advantages to the environment of using Biopol<sup>®</sup> in products.

(4)

1 .....

2 .....



(c) Describe how micro-organisms are used to aid the disposal of environmentally friendly polymers.

(2)

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**(Total for Question 2 = 10 marks)**



**3** Many developing countries host 'offshore' manufacturing facilities for multinational companies.

(a) Give **four** benefits to a developing country of hosting the manufacturing facilities of a multinational company.

(4)

1 .....

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2 .....

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3 .....

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4 .....

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(b) Explain **two** advantages for a multinational company of moving its manufacturing facilities to developing countries.

(4)

1 .....

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2 .....

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**(Total for Question 3 = 8 marks)**



4 (a) Artificial intelligence (AI) is being increasingly developed for use in the manufacturing industry.

(i) State what is meant by the term 'artificial intelligence' (AI).

(1)

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(ii) Explain **two** ways artificial intelligence (AI) can be used to support product design and manufacture.

(4)

1 .....

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2 .....

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(b) Explain **three** reasons why the operation of a just in time (JIT) system leads to 'lean manufacturing.'

(6)

1 .....

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2 .....

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3 .....

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(c) Describe the impact that the increasing use of computer integrated manufacturing (CIM) is having on employment and the nature of jobs.

(6)

Lined area for the answer to question (c).

**(Total for Question 4 = 17 marks)**





5 Three key principles of the Bauhaus design movement are:

- 'Form follows function'
- 'Products for a machine age'
- 'Everyday objects for everyday people'

Figure 1 shows a picture of Marcel Breuer's 'Wassily' chair.



Figure 1

(a) Describe how the 'Wassily' chair demonstrates these key principles.

(4)

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(b) The use of anthropometric data is an essential part of product design.

(i) State the meaning of the term 'anthropometric data.'

(1)

(ii) Describe how a designer would use anthropometric data to design a product that is suitable for a wide range of consumers.

(5)

**(Total for Question 5 = 10 marks)**



6 (a) Explain how a company benefits from carrying out a life cycle assessment (LCA) on its product.

(4)

Dotted lines for writing the answer.



\* (b) Reusing products such as printer ink cartridges is one strategy used to minimise waste.

Evaluate the issues associated with reusing products to minimise waste.

(4)

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**(Total for Question 6 = 8 marks)**







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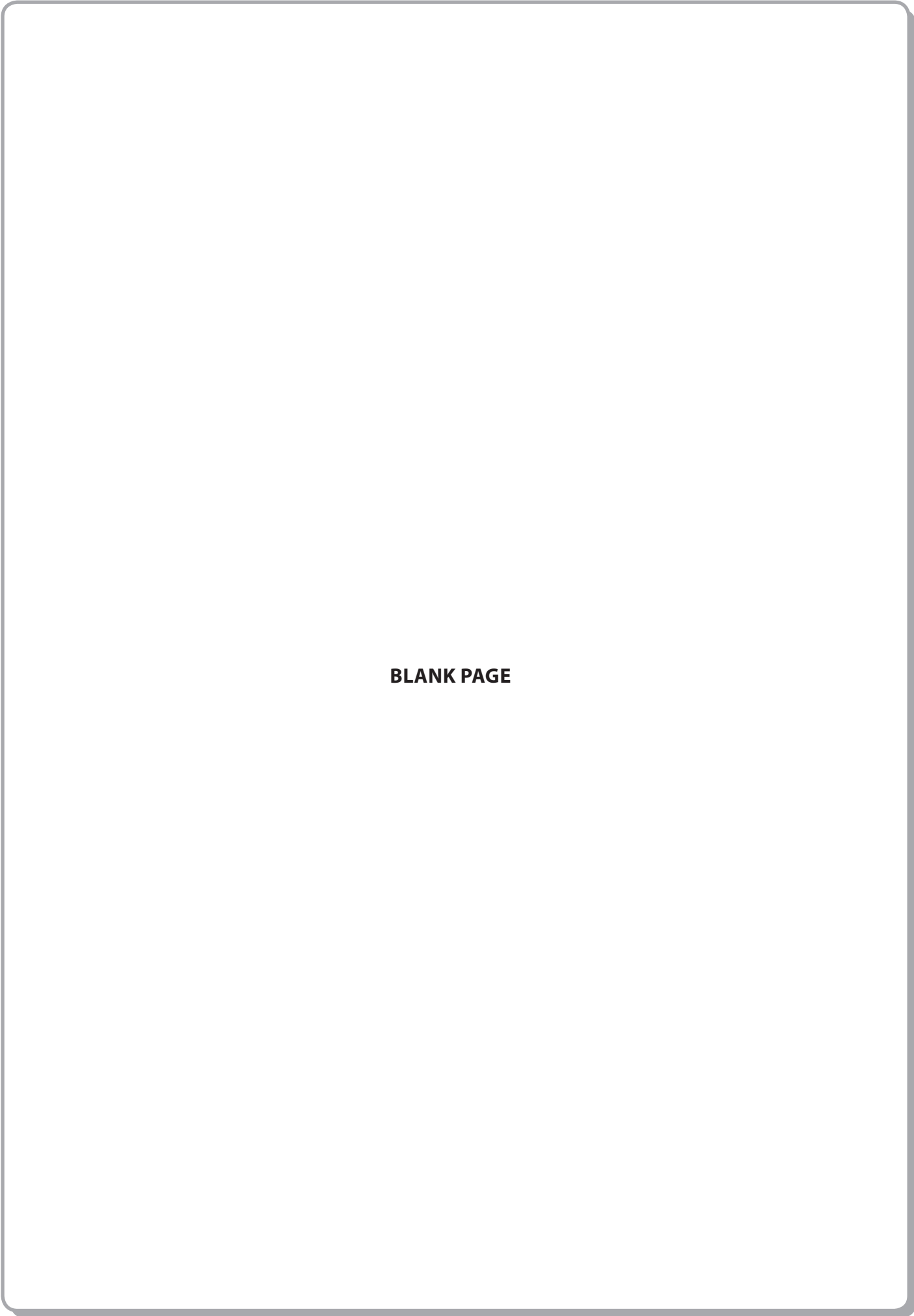
**(Total for Question 7 = 10 marks)**

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**TOTAL FOR PAPER = 70 MARKS**

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