

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCE

Design and Technology

Product Design: Graphic Products

Advanced

Unit 3: Designing for the Future

Wednesday 13 June 2012 – Afternoon

Time: 2 hours

Paper Reference

6GR03/01

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.
- 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** Designers need to consider key ergonomic factors when developing products for computer operators.



- (a) Describe how an adjustable chair can reduce back pain when working at a computer.

(2)

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(b) Complete the table below by:

- identifying **one** risk to the user when operating the piece of computer equipment
- explaining how the use of ergonomic design can overcome this risk.

Equipment	Risk	Use of ergonomic design
Keyboard

	(1)	(2)
Monitor

	(1)	(2)

(Total for Question 1 = 8 marks)



2 Manufacturers frequently ask designers to build obsolescence into their products.

(a) Explain the term 'built-in obsolescence'.

(2)

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(b) Complete the table below. Provide **one** statement outlining how obsolescence occurs for each type listed below and give **one** product example for each type.

Type of obsolescence	
Technological	Statement (1)
	Product example (1)
Style	Statement (1)
	Product example (1)
Physical	Statement (1)
	Product example (1)

(Total for Question 2 = 8 marks)



3 Computers connect to the world wide web in various ways.

(a) Outline the characteristics of an Integrated Systems Digital Network (ISDN).

(3)

(b) Discuss the reasons why broadband has displaced Integrated Systems Digital Network (ISDN) dial up services in the information and communication technology industry.

(5)

(Total for Question 3 = 8 marks)



4 Computer aided manufacture (CAM) is an essential part of a computer integrated manufacturing (CIM) system.

(a) Explain **two** disadvantages of computer aided manufacture (CAM) over manually operated machines.

(4)

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(b) Discuss the advantages to a manufacturer of using a computer integrated manufacturing (CIM) system.

(4)

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(Total for Question 4 = 8 marks)



5 Advanced manufacturing systems often include automated guided vehicles (AGVs).

(a) Name the type of feedback system used in automated guided vehicles (AGVs).

(1)

(b) Describe **one** type of guidance system used in automated guided vehicles (AGVs).

(3)

(c) Explain **two** ways in which concurrent manufacturing enables quick response manufacturing (QRM).

(4)

1

2

(Total for Question 5 = 8 marks)



6 Life cycle assessment (LCA) is used to assess the impact of a product 'from the cradle to the grave'.

(a) Discuss the environmental impact of producing the polymer casing of a new mobile phone with specific reference to:

(i) Raw materials

(3)

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(ii) Manufacture

(3)

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(b) Explain, with reference to a mobile phone, how 'repair versus replacement' can have a positive environmental impact.

(2)

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(Total for Question 6 = 8 marks)



7 When designing a new product the question 'is it worth doing?' should be frequently asked.

(a) Outline the economic issues raised by this question for commercial designers and manufacturers.

(4)

* (b) Discuss the **advantages** to the manufacturer of using the internet for marketing a product.

(4)

(Total for Question 7 = 8 marks)



[illegible]

TOTAL FOR PAPER = 70 MARKS