

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										



General Certificate of Secondary Education
Specimen Paper

Design and Technology: **XXXX/W** Product Design

Written Paper

Date: Time

You will need no other materials.

- a pen, a pencil, a ruler, an eraser, a pencil sharpener and coloured pencils.

Time allowed:

- 2 hours

Instructions

- Use black ink or black ball-point pen. Use pencil and coloured pencils only for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- Do all rough work in the book. Cross through any work you do not want to be marked.

Information

- The maximum mark for this paper is 120.
- The marks for questions are shown in brackets.
- The question in Section A relates to the context referred to in the preparation sheet that was previously issued.
- You are reminded of the need for good English and clear presentation in your answer. Quality of written communication will be assessed in Question 1(c) and Question 6(c).

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
TOTAL	

XXXX/W

1 (a) Identify **three** design criteria which will make your product successful with the target market. Give **two** reasons for each design criteria.

An example is given for you.

Design Criteria	Reasons
<i>Should be inexpensive to buy</i>	<i>To enable young people to be able to afford to buy it</i>
	<i>To sell more products</i>
1
2
3

(9 marks)



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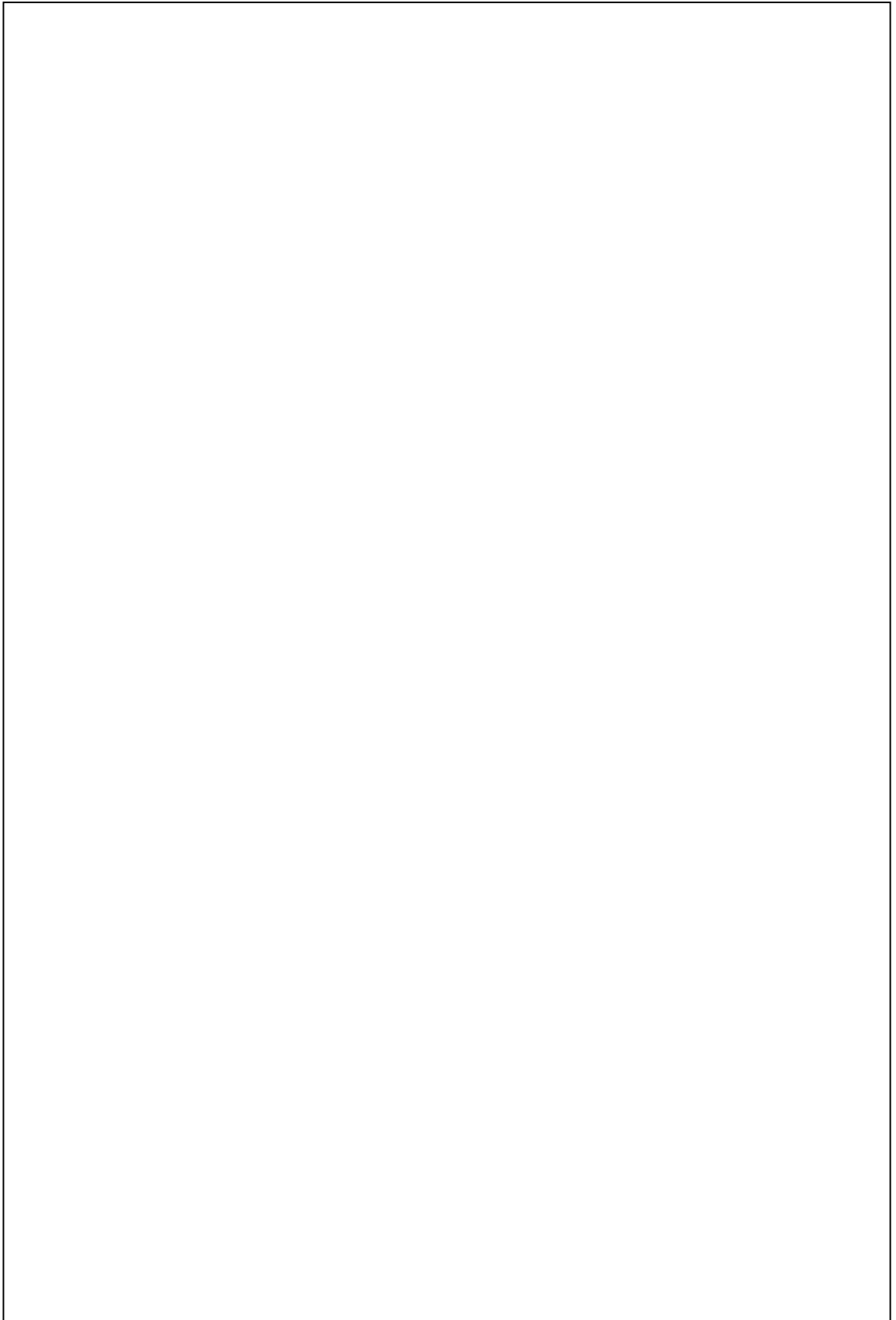
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- 1 (b) In the space below and opposite, develop a design for your product in enough detail for somebody else to be able to make it.

Marks will be awarded for:

- 1 (b) (i) clarity of communication (6 marks)
1 (b) (ii) a creative response (5 marks)
1 (b) (iii) feasibility (4 marks)





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1 (c) Evaluate the effectiveness of your design proposal against the original design criteria you gave in part (a).

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(6 marks)

30



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SECTION B

You should answer **all** questions in this section.







Question 2 is about materials and their properties

You are advised to spend about 15 minutes on this question.

- 2 (a) Choose **three** of the products in the table.
 State a main material or ingredient they are made from and list **two** properties of the material or ingredient that make it suitable for the product.
 An example has been completed for you.

Product	Material or ingredient	Property of material or ingredient
Scooter 	<i>Aluminium alloy</i>	<i>Lightweight</i>
		<i>Strong compared to weight.</i>
Shirt 		1
		2
Muffin 		1
		2
Mug 		1
		2



Product	Material or ingredient	Property of material or ingredient
Playing cards 		1
		2
Toy duck 		1
		2
Skateboard 		1
		2
Jumper 		1
		2
Risotto 		1
		2
Casserole dish 		1
		2

(9 marks)



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2 (b) Select **one** of the materials from the box below.
Circle your choice.

flour	copper	polyester
Scots pine	polythene	sugar
linen	corrugated cardboard	slip

2 (b) (i) What is the source of the raw material?

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(1 mark)

2 (b) (ii) Describe how the raw material is processed for manufacture into products.

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(3 marks)



Question 3 is about packaging and environmental issues

You are advised to spend about 20 minutes on this question.

3 (a) The sandwich carton shown below is claimed to be environmentally friendly.



3 (a) (i) The window has been manufactured from corn starch rather than traditional plastic.

Explain why corn starch has been chosen.

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(3 marks)

3 (a) (ii) The cardboard has been made from timber grown in a sustainable forest.

Explain what this means.

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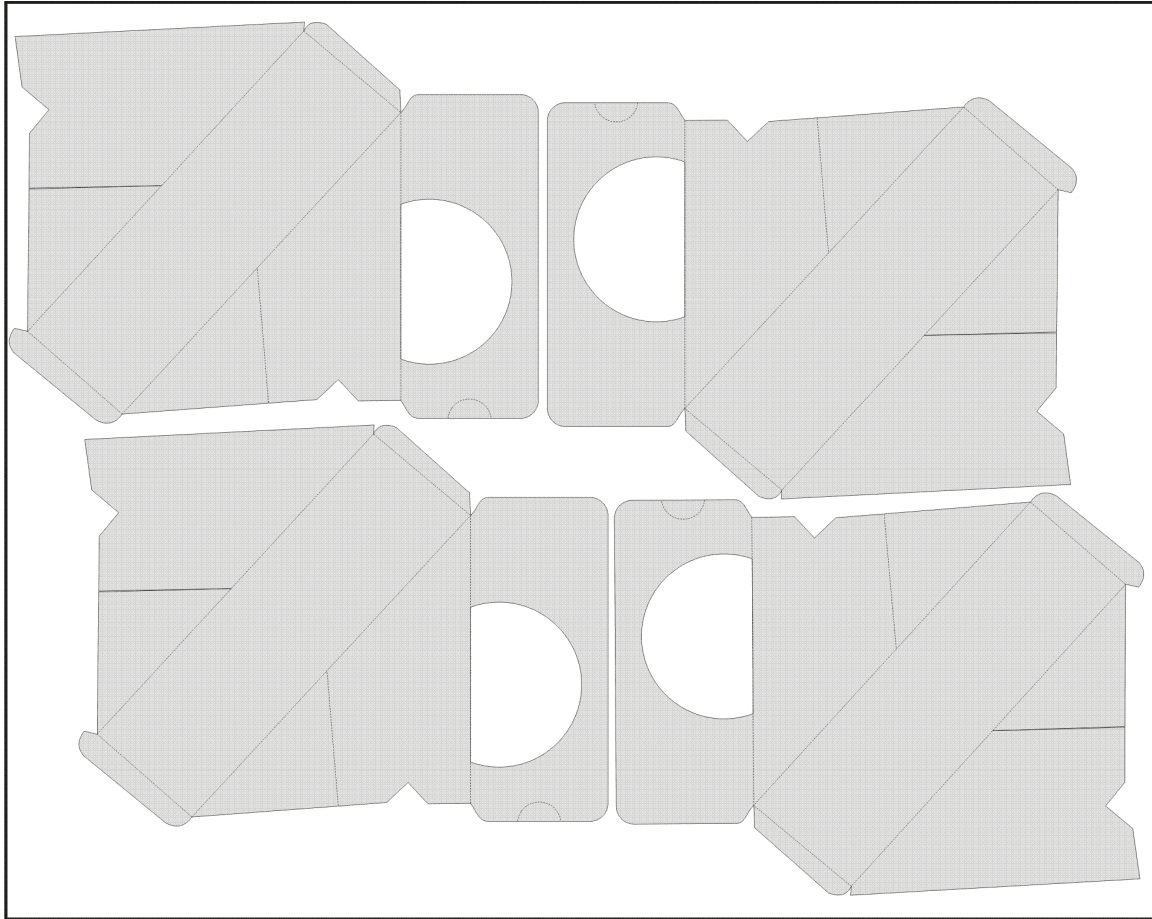
(3 marks)



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3 (b) The nets for the sandwich carton have been arranged and printed onto cardboard sheets as shown in the diagram below.



3 (b) (i) Explain why this arrangement might be regarded as environmentally friendly.

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(2 marks)



- 3 (b) (ii) Name a suitable printing process for manufacturing these cartons in large quantities.

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(2 marks)

- 3 (b) (iii) Name the process used for cutting out and creasing these cardboard nets.

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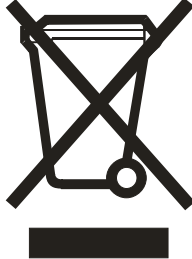


(2 marks)



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3 (c) Explain what **two** of the symbols shown below mean.

	
<p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p>
	
<p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p>

(4 marks)



3 (d) Explain in detail what you understand by the term *carbon footprint*.

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(3 marks)

19



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Question 4 is about product manufacture

You are advised to spend about 25 minutes on this question.

- 4 A school is hosting a visiting theatre company and would like to sell souvenirs at the performance to promote the school in the local community.

Each material area of the Design and Technology Department of King's School has been asked by the head teacher to manufacture 200 products based on the school logo.

School logo



- 4 (a) Simplify the school logo to make it suitable to be manufactured in a batch of 200.
Draw your design in the box below.

A large, empty rectangular box with a black border, intended for the student to draw a simplified version of the school logo.

(4 marks)



4 (b) (i) Identify a suitable manufacturing process to make the 200 products.

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(1 mark)

4 (b) (ii) Choose a material you are familiar with and explain why it is suitable for the manufacturing process you identified in part (i) and this scale of production.

Material

(1 mark)

Explanation.....

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(2 marks)



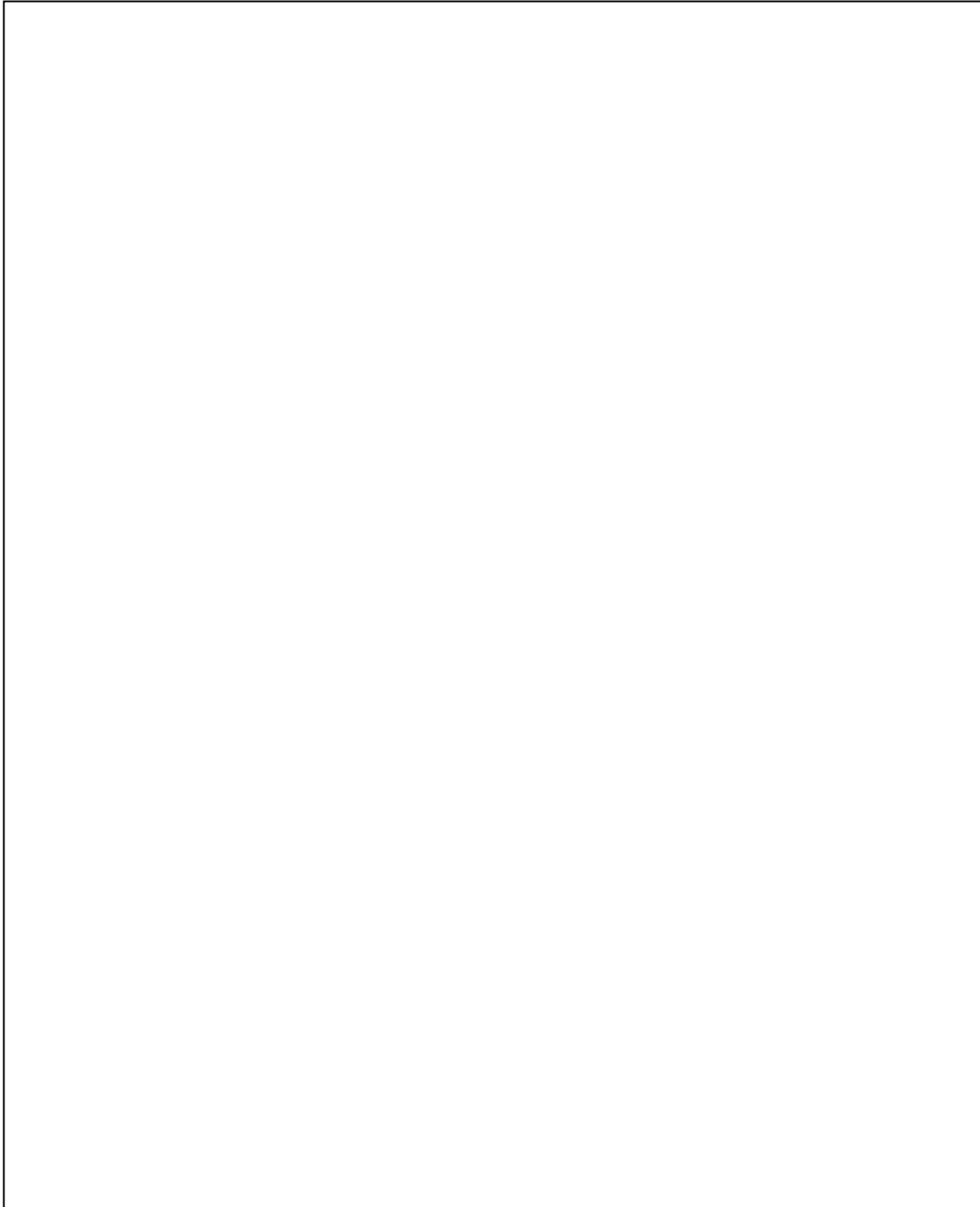
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- 4 (c) Use sketches and notes to explain how you would make 200 of the products using the material you have selected.

Marks will be awarded for:

- 4 (c) (i) accurate description of each stage of the process *(6 marks)*
4 (c) (ii) correct naming of tools and equipment *(3 marks)*
4 (c) (iii) quality of communication. *(4 marks)*



4 (d) Describe how you would make sure your products are safe for the user.

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(3 marks)

4 (e) Identify a safety rule you would follow while making your product and explain why you would follow it.

4 (e) (i) Rule.....

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(1 mark)

4 (e) (ii) Reason to follow rule.....

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(2 marks)

27



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Question 5 is about product marketing and ethical issues

You are advised to spend about 15 minutes on this question.

5 Products are often designed with a specific end user in mind. Two training shoes are shown below.

Training shoe A



Training shoe B



5 (a) (i) Identify a possible target market for each of the training shoes pictured.

Training shoe A
(1 mark)

Training shoe B.
(1 mark)

5 (a) (ii) Compare and contrast the suitability of each of the training shoes for their target markets.

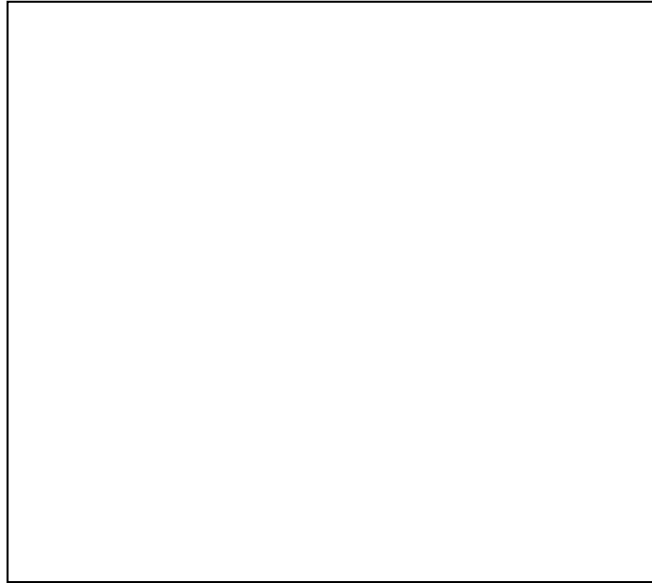
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(4 marks)



5 (b) Branding is an important part of marketing a product.

5 (b) (i) Draw the logo of a sports brand you are familiar with.



(2 marks)

5 (b) (ii) What type of consumer would buy products from your selected brand?

Give reasons for your answer.

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(3 marks)



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5 (c) Many products are designed in the UK but are manufactured abroad.

Why is this the case?

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(3 marks)

5 (d) Explain why consumers are increasingly interested in buying Fair Trade products.

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(3 marks)



Question 6 is about the use of computers in the design and manufacture of products

You are advised to spend about 15 minutes on this question.

6 Computers have an important role in the design and manufacture of products.

6 (a) (i) What does the term CAD stand for?

.....

(1 mark)

6 (a) (ii) What does the term CAM stand for?

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(1 mark)

6 (b) Give **two** advantages of using CAD/CAM in the design and manufacture of products.

Advantage 1

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(2 marks)

Advantage 2

.....

(2 marks)



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Additional Sample Questions

This question is about smart and new materials and their use in designing and manufacturing products.

1 (a) Describe fully what is meant by the term *smart material*.

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(3 marks)

1 (b) (i) Give an example of a smart material.

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(1 mark)

Turn over for the next question



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1 (b) (ii) Describe the properties of the smart material you have named and explain how it might be used in a product.

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(3 marks)



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