

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										



General Certificate of Secondary Education
June 2014

Design and Technology: Product Design

45551

Unit 1 Written Paper

Friday 13 June 2014 1.30 pm to 3.30 pm

For this paper you must have:

- a black 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.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 120.
- The question in Section A relates to the context referred to in the Preliminary Material that was previously issued.
- All dimensions are given in millimetres unless otherwise stated.
- You are reminded of the need for good English and clear presentation in your answers. Quality of Written Communication will be assessed in Question 5(c).

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



J U N 1 4 4 5 5 5 1 0 1

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Section A

Answer this question in the spaces provided.

Question 1 is about promotional packaging to celebrate a special event.

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

- 1 The 2014 Commonwealth Games will be in Glasgow, Scotland. The images below have been designed to promote the games.



- 1 (a) Describe **two** methods of gathering information from people to find out what they think makes a good image to promote the games.

[4 marks]

Method 1.....

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Method 2.....

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Turn over ▶



- 1 (b) The insulated mug below will be on sale as a promotional gift at the games.

Specification for the mug



Volume	400 ml
Space needed by the mug	170 mm × 120 mm × 80 mm
Materials	Stainless steel and polypropylene
Care	Dishwasher safe
Features	Sealable lid to keep heat in

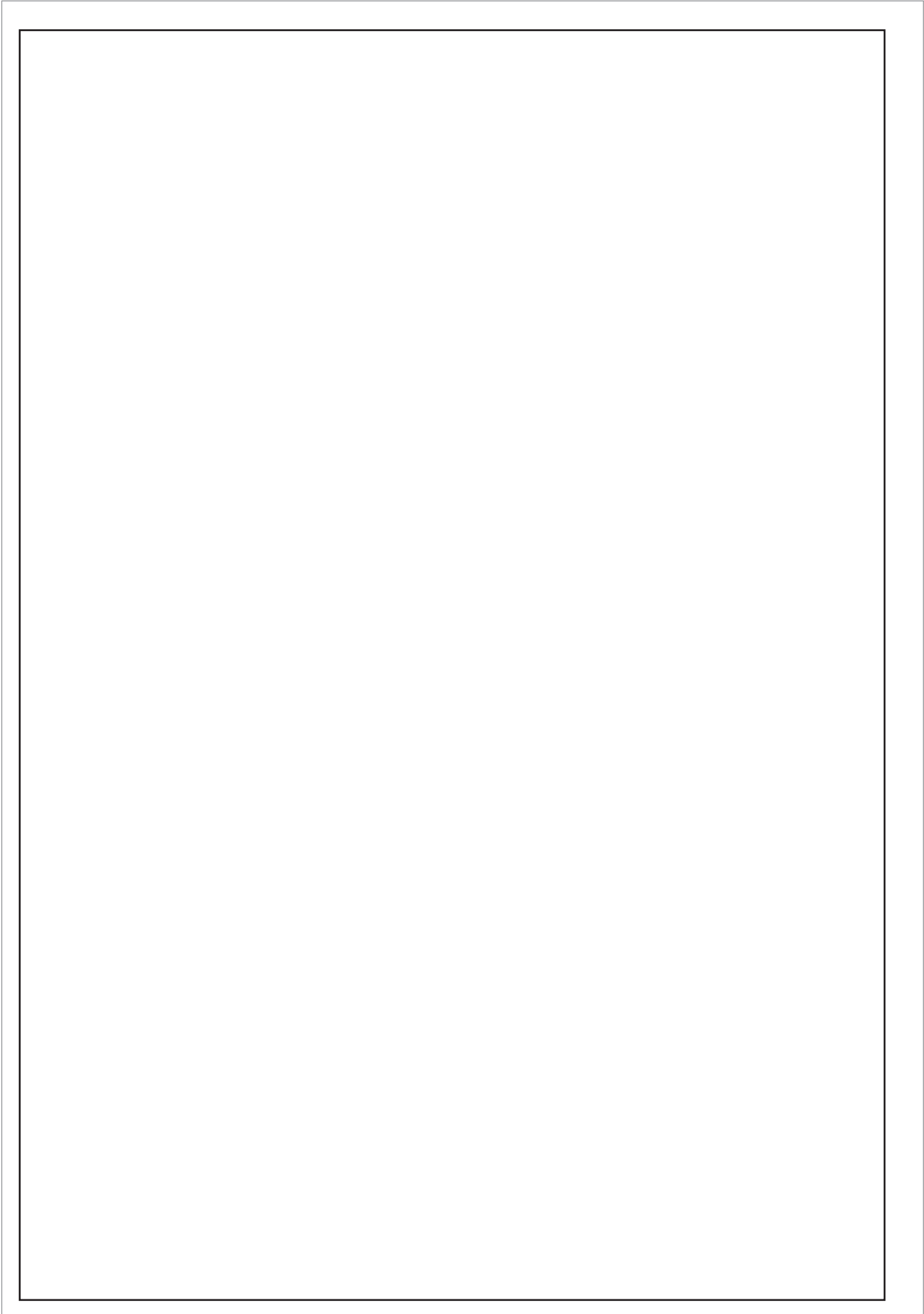
Sketch a design for packaging the insulated mug.

Marks will be given for:

- a creative packaging solution promoting the unique nature of the sporting event
- the construction of the packaging to hold and display the mug
- the protection of the mug during transport and storage before purchase
- information to the customer and end user about the product specification, features and dimensions.

[15 marks]



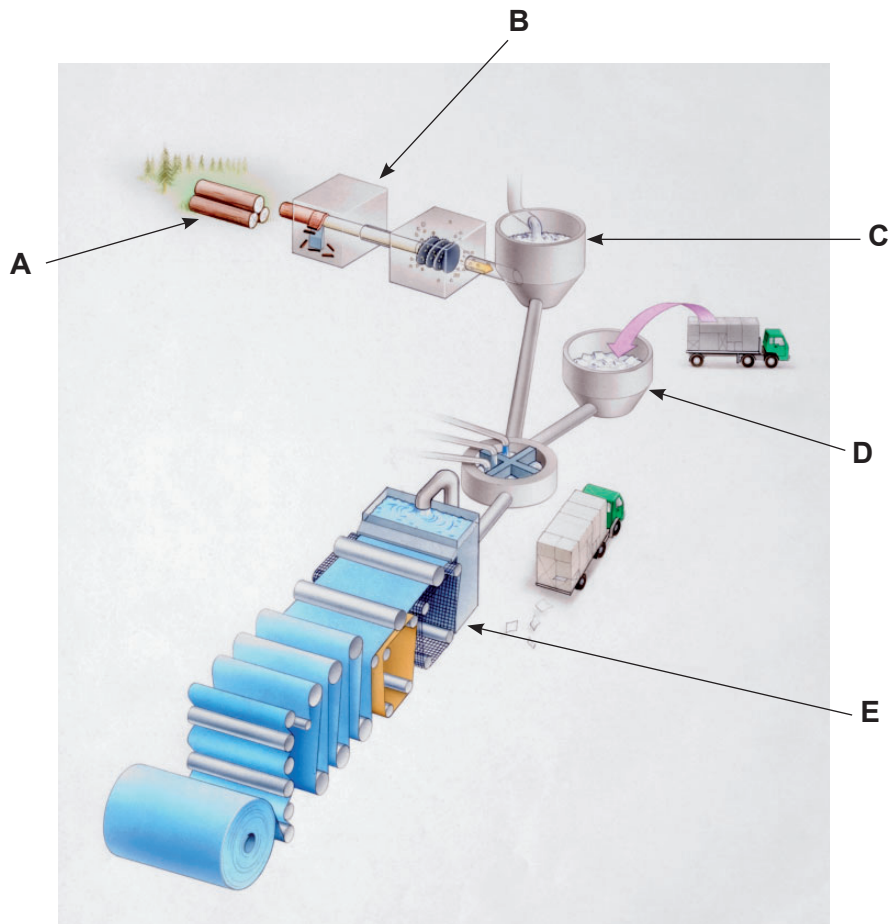


Turn over ▶



- 1 (c) Primary processing is required to convert raw timber into workable paper and card for use in packaging.

The diagram below shows the main stages of processing.



Complete the table below inserting the correct letter under the appropriate description.

One of the boxes in the table has been completed for you.

[3 marks]

Chips of wood are processed in water and chemicals to make wood pulp	Pulp is poured over a fine mesh.	Trees are cut and converted into logs.	Waste paper for recycling may be added.	Cut logs are debarked.
		A		



- 1 (d)** Promotional packaging can make use of applied finishing processes to improve its appearance and function.

Six finishing processes are listed below.

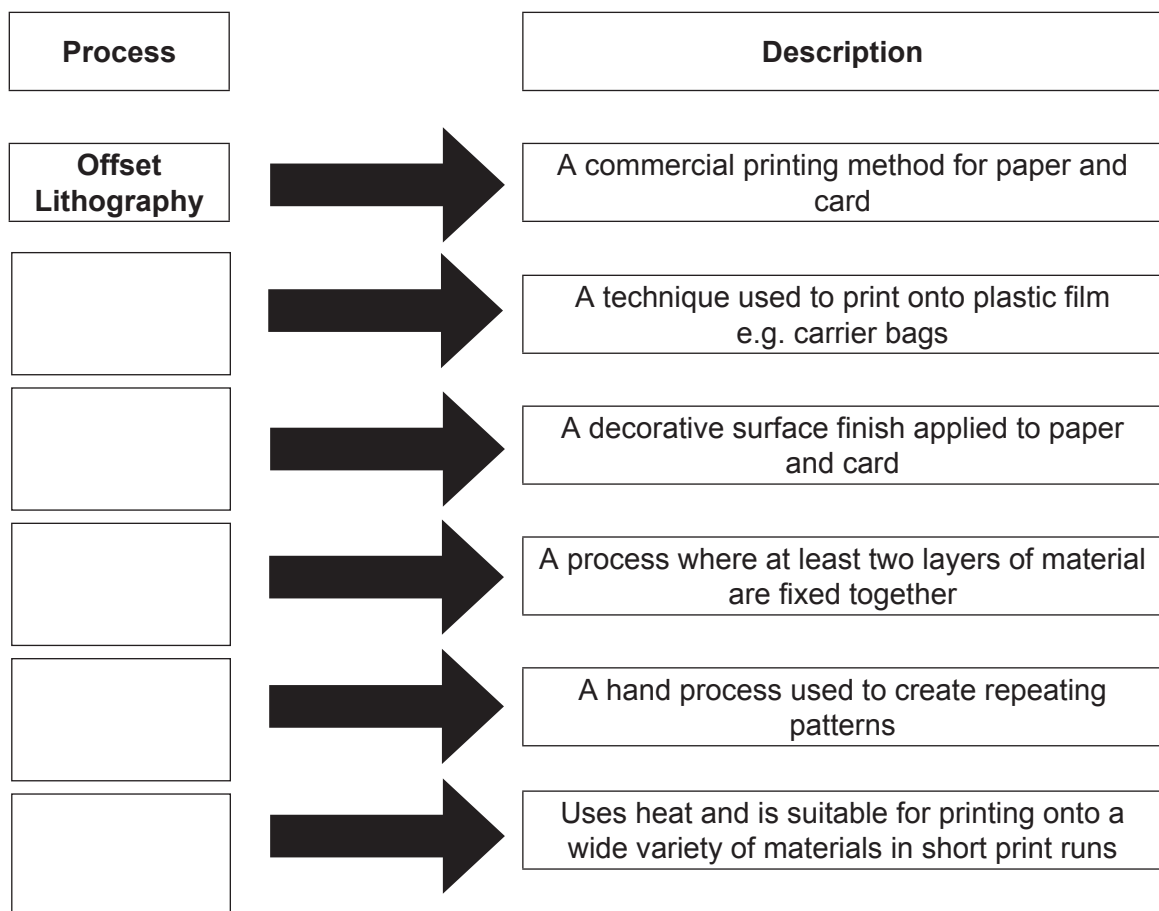
Screen Printing	Flexography	Dye Sublimation
Laminating	Embossing	Block Printing

Complete the diagram below by selecting the process that best matches each description.

Do not use any process more than once.

An example is given for you.

[5 marks]



Turn over ▶



Section B

Answer **all** questions in the spaces provided.

Question 2 is about product evolution and environmental issues.

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

2 (a) Explain the term 'product evolution'.

[2 marks]

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2 (b) The pictures below show different designs for milk containers.



Traditional glass
milk bottle



HDPE plastic
milk carton



Reusable jug
and plastic milk bag

Give **two** reasons why the designs for milk containers have evolved.

[4 marks]

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2 (c) Complete the table below.

Do not use the same answer more than once. Some parts of the table have been completed for you.

[9 marks]

Container	Two advantages of this container	Two disadvantages of this container
	1. Can be sterilised 2.	1. 2.
	1. 2.	1. Heavy to carry 2.
	1. Bag can be printed onto 2.	1. 2.

Turn over ►



2 (d) Explain the following terms.

[6 marks]

1. Product miles.....

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2. Carbon footprint.....

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3. Fairtrade

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21



Question 3 is about safety and consumer issues.

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

3 (a) Before using tools and equipment you should always complete a risk assessment.

Select **one** tool or piece of equipment from the list below. Circle your choice.

Soldering iron	Sewing machine	Pillar drill
Paper and card die cutting machine	Vacuum forming machine	Vertical belt sander
Food processor	Laser cutter	Ceramics oven

An example risk assessment for the use of a craft knife has been completed below.

Potential hazard	Action to minimise hazard
You can cut your fingers.	When possible use a safety ruler to protect your fingers.

In the table below complete a risk assessment for **two** hazards associated with the tool or piece of equipment you have selected.

[4 marks]

Potential hazards	Action to minimise hazards
1.....	1.....
2.....	2.....

Turn over ▶



3 (b) Before selling a product, both the designer and manufacturer must consider the safety of the end user.

Look at the picture below.



3 (b) (i) Label **three** features on the bicycle that improve its safety for the cyclist.

[3 marks]

3 (b) (ii) Explain with examples how safety could be improved by:

- additional features on the bicycle
- specialist equipment for the cyclist to wear.

[6 marks]

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3 (c) The symbol below was printed on the maintenance and care instructions for the bicycle.



3 (c) (i) What is the name of the symbol? **[1 mark]**

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3 (c) (ii) What does the symbol tell the consumer about the bicycle? **[2 marks]**

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3 (d) Government legislation exists to protect consumers.

3 (d) (i) Name **one** piece of legislation that ensures products are safe to use. **[1 mark]**

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3 (d) (ii) Explain how the legislation you have identified protects consumers. **[2 marks]**

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Question 4 is about manufacturing products.

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

- 4 A school business and enterprise group wants to set up a company to produce personalised birthday products for sale to family and friends.

The Design & Technology department has agreed to help with the manufacture of the personalised birthday products. They will be made in batches of twenty in school.



Small games for a child's party bag



Finger puppets



Party hats



Birthday biscuits

Choose **one** of the above products to manufacture later in this question.

My chosen product is.....



4 (a) (i) Name a suitable specific **main** material for your birthday product.

[1 mark]

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4 (a) (ii) Explain why the specific main material you have chosen in part (a)(i) is suitable for this scale of production.

[2 marks]

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Question 4 continues on the next page

Turn over ▶

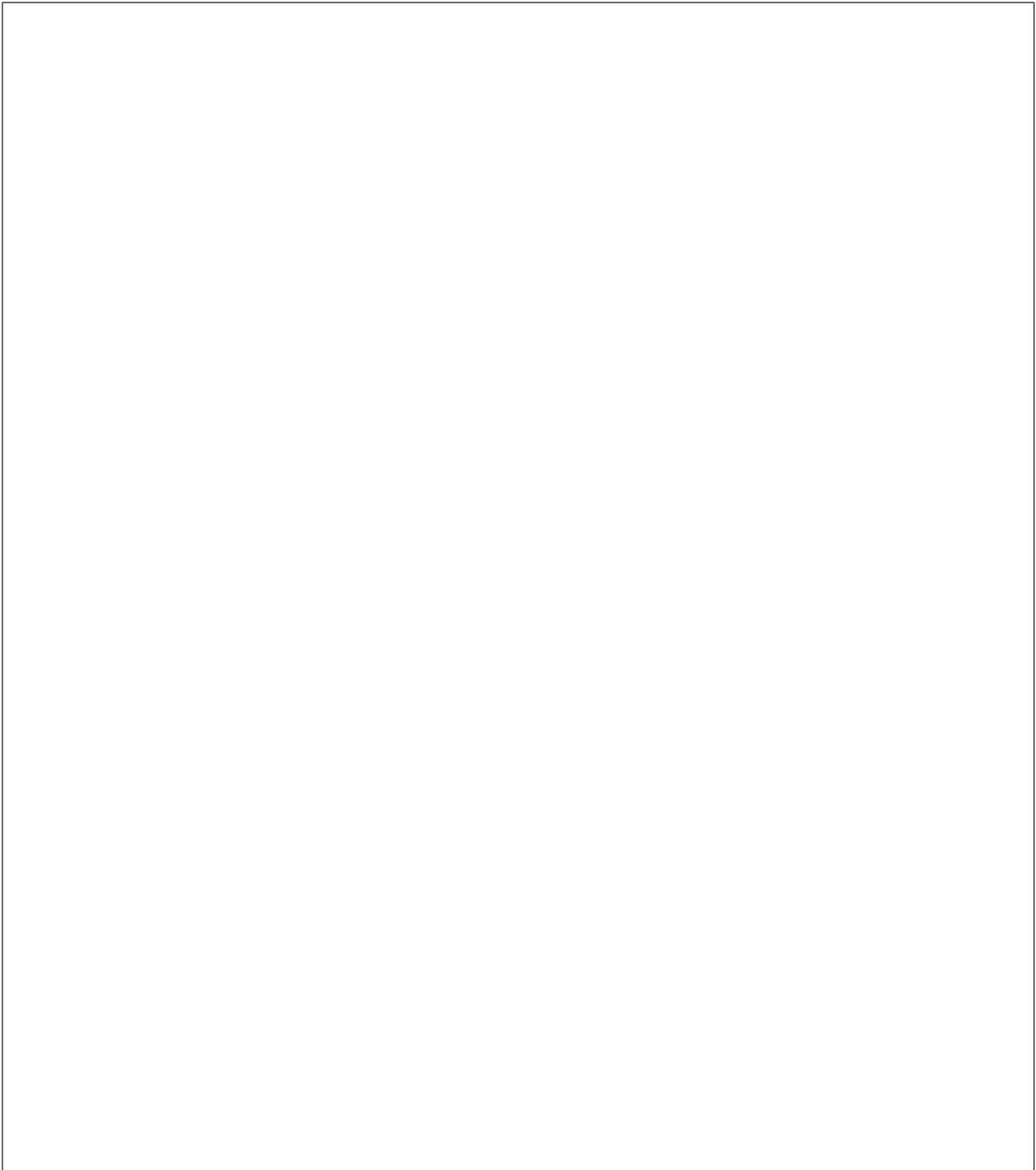


4 (b) Use notes and sketches in the space below to show how you would make your chosen product.

There are marks for:

- a clear layout and correct order of processes
- identification of appropriate tools and equipment
- quality of communication.

[12 marks]



4 (c) When manufacturing in batches the following aids can be helpful.

Templates	Jigs	Moulds	Formers	Dies
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Choose **three** of the aids given above. Use notes and/or sketches to explain their use.

[9 marks]

Manufacturing aid choice:

Explanation:

Manufacturing aid choice:

Explanation:

Manufacturing aid choice:

Explanation:



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Question 5 is about design movements and design methodology.

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

5 (a) (i) Name a design movement that has influenced design thinking.

[1 mark]

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5 (a) (ii) Name a designer associated with the movement you have named in part (a)(i).

[1 mark]

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5 (b) Describe **two** features associated with the design movement you have named in part (a)(i).

[4 marks]

Feature 1

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Feature 2

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Question 5 continues on the next page

Turn over ▶



5 (c) Designers sometimes use an image or a style from the past. This is called 'retro design'.

The pictures of the radios below show how design from the past has been used in a more modern radio.



A 1940s radio



A modern digital
radio/CD player

Use examples to explain how 'retro design' has influenced the design of products which can be made using modern technology.

Quality of written communication will be assessed in your answer.

[9 marks]

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Question 6 is about communicating and representing ideas.

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

6 (a) (i) Name a two dimensional (2D) drawing technique.

[1 mark]

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(6) (a) (ii) Explain the advantages of your chosen drawing technique.

[3 marks]

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6 (b) (i) Name a three dimensional (3D) drawing technique.

[1 mark]

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6 (b) (ii) Explain the advantages of your chosen drawing technique.

[3 marks]

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6 (c) Describe how information and communication technology (ICT) can be used to communicate and present ideas during design development.

[6 marks]

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END OF QUESTIONS



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