AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

GCSE

DESIGN AND TECHNOLOGY: PRODUCT DESIGN

Unit 1 Written Paper

Monday 27 June 2016 Morning Time allowed: 2 hours

Materials

For this paper you must have:
- a black pen
- a pencil
- a ruler
- an eraser
- a pencil sharpener
- coloured pencils.

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 the answer 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 4(b).

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Section A

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

1 This question is about designing.

You are advised to spend about 30 minutes on this question.

Charities and fund-raising organisations use collection boxes to raise money. A charity has identified a need for a new and innovative flat pack collection box. It will require assembly before use.

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1 (a) In the table below give **three** design criteria which will make a new and innovative collection box fit for purpose.

Give **one** reason for each design criterion.

An example is given for you.

[6 marks]

Example design criterion	**Reason**
Must be flat pack	To save storage space when being transported from the place of manufacture to the end user.

Design criterion	**Reason**
1 _____	_____
2 _____	_____
3 _____	_____

Question 1 continues on the next page

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1 (b) In the space provided, use notes and sketches to show your design for a flat pack collection box.

Marks will be given for:

- a creative solution that meets your design criteria and includes surface decoration
- specific names of materials and construction techniques
- details of how to assemble your collection box before use
- how to open your collection box to get the money out.

[15 marks]

The images below are given to inspire you.

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1 (c) Using your design criteria in part (a), evaluate the suitability of your design as a flat pack collection box.

[6 marks]

1 (d) Name **one** commercial production process for cutting out card components.

[1 mark]

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1 (e) Explain what the following packaging symbols mean.

[4 marks]

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Turn over for the next question

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Section B

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

2 This question is about manufacturing systems and organising production.

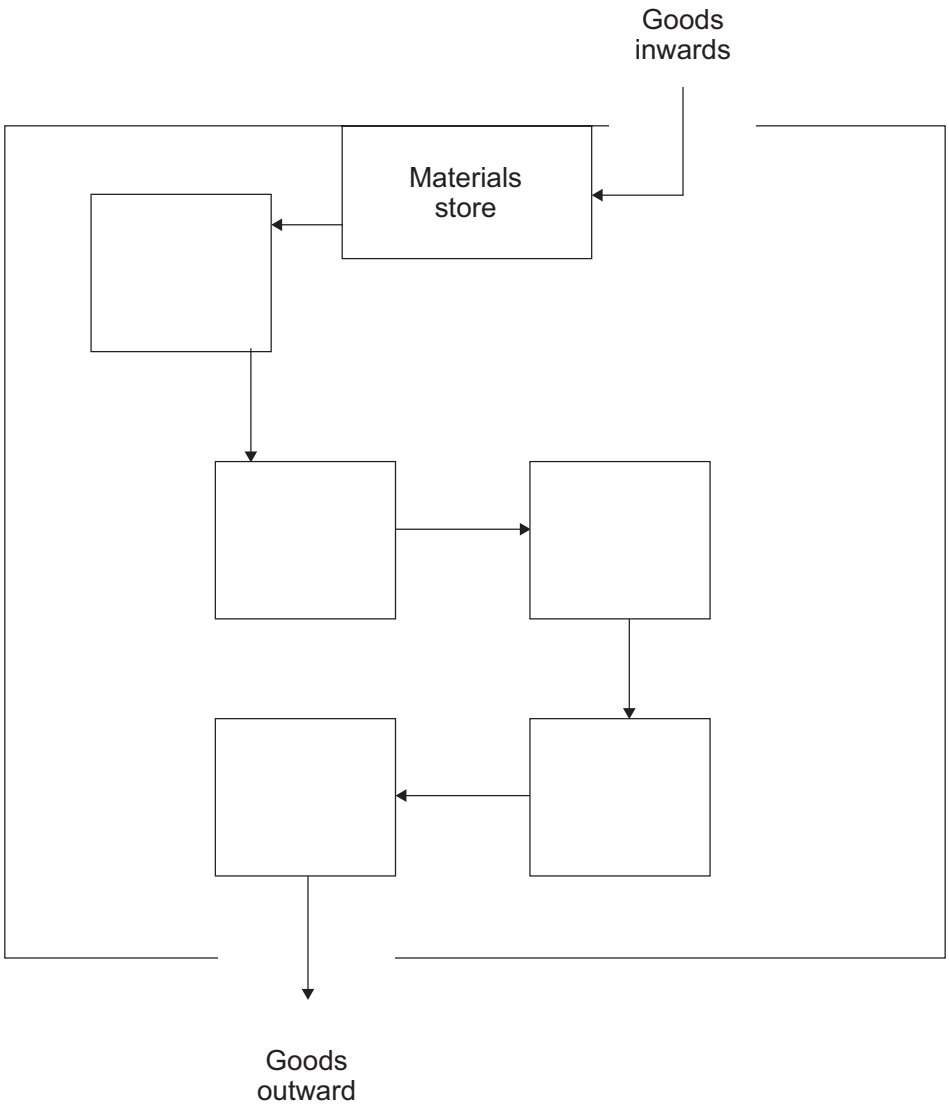
You are advised to spend about 15 minutes on this question.

2 (a) The empty boxes on the factory floor plan below show five workstations.

Label each empty box in the plan with the appropriate letter from the table below.

A	B	C	D	E
Assembly	Measuring and marking out	Cutting and shaping	Material Preparation	Packing

[4 marks]



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2 (b) Efficient working methods are a common feature of modern manufacturing systems.

2 (b) (i) What is meant by the term 'Just in Time' (JIT) production?

[3 marks]

2 (b) (ii) What is meant by the term 'continuous production'?

[3 marks]

Question 2 continues on the next page

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2 (c) Why do manufacturers use barcodes?

[3 marks]

2 (d) The manufacture of products can create waste materials.

Describe ways that computer-aided design (CAD) and computer-aided manufacture (CAM) can reduce waste.

[4 marks]

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ANSWER IN THE SPACES PROVIDED

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3 This question is about selecting the correct processes to make products.

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

3 (a) Choose **three** of the products listed in the box below. Complete the table by matching your **three** chosen products to the correct process. Do not use any product more than once. Explain why the process is suitable for each of the **three** products you have chosen.

[3 x 3 marks]

Fruit juice container	Polyester/cotton shirt	Wooden salad servers	Ceramic tea pot
Sponge cake	Christmas cracker	Toffee apple	Silk tie
Steel climbing frame	Plastic washing-up bowl	Card tissue box	Digital radio

Process	Product	Reason for process suitability
Injection moulding		
Blending		
Lamination		

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Aeration		
Surface mounting		
Welding		
Perforation		
Screen Printing		
Glazing		

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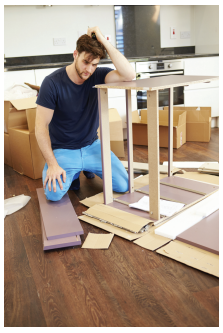
3 (b) All the products below use stock forms of material in their fabrication.

		
Coat	Fruit pie	Flat pack furniture
Sketch pad	Supermarket meal box	Shampoo bottle
Garden shed	Glazed vase	Wine bottle holder

3 (b) (i) Choose **one** of the products above.

Name a specific main material used to make the product

[1 mark]

Product _____

Material _____