

Write your name here

Surname

Other names

**Pearson  
Edexcel GCSE**

Centre Number

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Candidate Number

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**Manufacturing (Double Award)  
Engineering (Double Award)**

**Unit 3: Application of Technology in Engineering  
and Manufacturing**

**Paper B: Food and Drink, Biological and Chemical**

Wednesday 24 May 2017 – Morning

**Time: 1 hour 30 minutes**

Paper Reference

**5EM03/3B**

**You must have:**

Notes and sketches collected during your pre-release research.  
Ruler, pen, pencil, rubber.

Total Marks

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### Instructions

- Use **black** ink or ball-point pen.
- **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 110.
- 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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SECTION A

Answer ALL questions.

Some questions must be answered with a cross ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 All of the products listed below belong to a manufacturing sector.

(a) Put a cross in the **two** boxes below where the products belong to the **food and drink** sector.

(2)

Products	Put a cross in <b>two</b> boxes below
Grapefruit juice	<input type="checkbox"/>
Hand towel	<input type="checkbox"/>
Soldering iron	<input type="checkbox"/>
Tea cake	<input type="checkbox"/>
Ring binder	<input type="checkbox"/>
Adjustable spanner	<input type="checkbox"/>

(b) Put a cross in the **two** boxes below where the products belong to the **biological and chemical** sector.

(2)

Products	Put a cross in <b>two</b> boxes below
CCTV	<input type="checkbox"/>
Train ticket	<input type="checkbox"/>
Moisturiser	<input type="checkbox"/>
Kettle	<input type="checkbox"/>
Lip balm	<input type="checkbox"/>
Endoscope	<input type="checkbox"/>

(Total for Question 1 = 4 marks)

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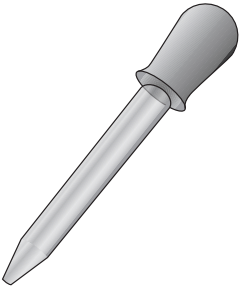
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2 The tables below show some equipment used during the manufacture of food and drink, biological and chemical products.

(a) Complete Table 1 by naming each piece of equipment.



(2)

Equipment	Equipment name	Use
		To make food mixtures into a smooth consistency.
		To apply hot fats and juices to meats when roasting.

**Table 1**

(b) Complete Table 2 by explaining what each piece of equipment is used for.

(4)

Equipment	Equipment name	Use
	Slotted spoon	
	Mandolin	

**Table 2**

**(Total for Question 2 = 6 marks)**



3 Draw a straight line to link each **Term** listed below to the most appropriate **Key Area**.

Each **Key Area** can be used more than once.

**Term**

**Key Area**

System remote panel

Modern materials

Sodium citrate

Database

Control technology

Chymosin

Conveyor systems

Information and communications  
technology (ICT)

Fructan

Virtual learning environment  
(VLE)

(Total for Question 3 = 7 marks)



4 (a) Finishing processes are used when manufacturing frozen puff pastry sheets in the food and drink, biological and chemical sector.

(i) Name **two** other food products from this sector that use finishing processes in their manufacture.

(2)

Product 1

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Product 2

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(ii) Name **two** different finishing processes used in the manufacture of food products from this sector.

(2)

Finishing process 1

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Finishing process 2

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(iii) Describe **one** finishing process you named in 4(a)(ii).

(2)

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(b) Quality control techniques are used in the manufacture of products in the food and drink, biological and chemical sector.

Describe **two** examples of quality control techniques used in the manufacture of food products from this sector.

(4)

1 .....

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2 .....

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**(Total for Question 4 = 10 marks)**



5 (a) State **two** functions of a computer-aided manufacturing (CAM) system. (2)

1 .....

2 .....

(b) A manufacturer has changed from using traditional production methods to computer-aided manufacturing (CAM) techniques.  
Describe **one** disadvantage of this change for the manufacturer. (2)

.....

.....

(c) Programmable logic controllers (PLCs) are a control technology.  
Describe **two** benefits of using PLCs for a manufacturer. (4)

1 .....

2 .....

(Total for Question 5 = 8 marks)



6 Communications technologies, including **Wi-Fi**, are used by manufacturers of food and drink, biological and chemical products.

(a) (i) Name **one** example, other than **Wi-Fi**, of a communications technology. (1)

.....

.....

(ii) Describe the term **Wi-Fi**. (2)

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(b) Embedded computers are used by manufacturers of food and drink, biological and chemical products.

Explain **three** reasons why a manufacturer would use embedded computers during manufacture. (6)

1 .....

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2 .....

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3 .....

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(Total for Question 6 = 9 marks)





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7 Handling information and data is an essential feature in food and drink, biological and chemical companies.

Explain **one** benefit that information and data handling systems have for:

(a) design

(3)

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(b) production planning

(3)

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**(Total for Question 7 = 6 marks)**

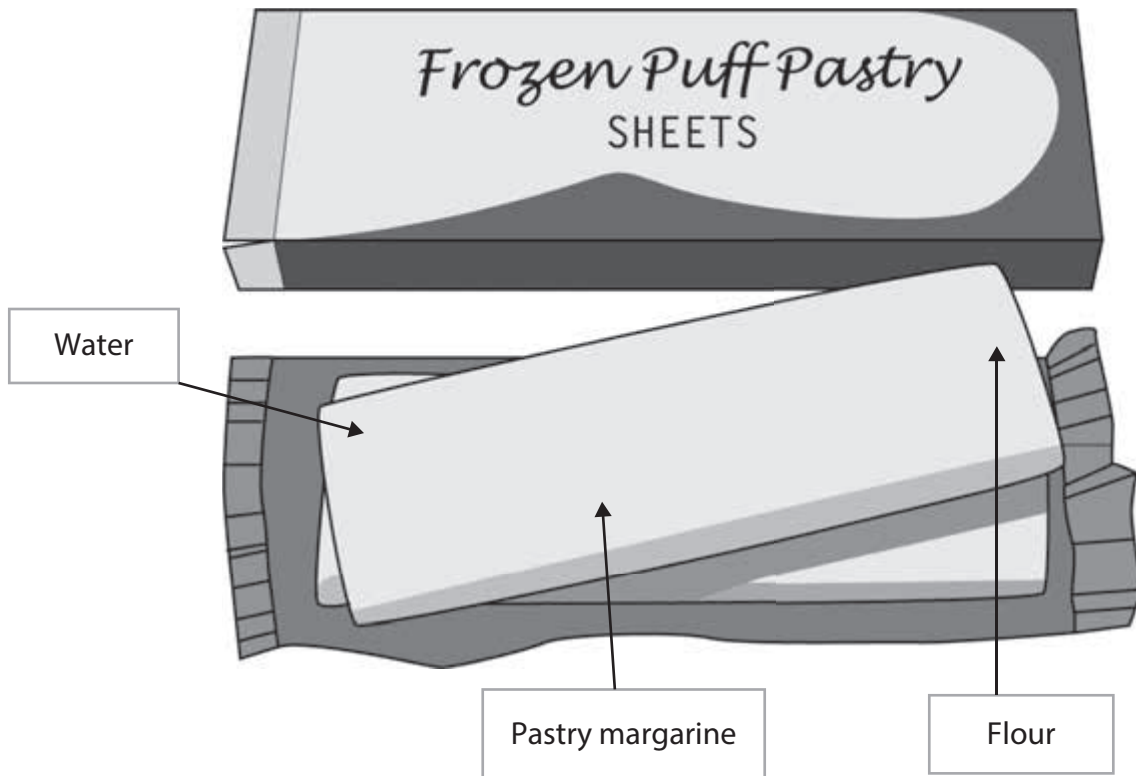
**TOTAL FOR SECTION A = 50 MARKS**



## SECTION B

Answer ALL questions in Section B with reference to the manufacture of mass produced frozen puff pastry sheets.

The diagram below shows frozen puff pastry sheets.



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8 Describe, using notes and sketches:

(a) the function of the water

(3)

water

(b) the function of the flour

(3)

flour



P 4 8 6 5 9 A 0 1 1 2 0

(c) State **three** functions of the pastry margarine.

(3)

- 1 .....
- 2 .....
- 3 .....

**(Total for Question 8 = 9 marks)**

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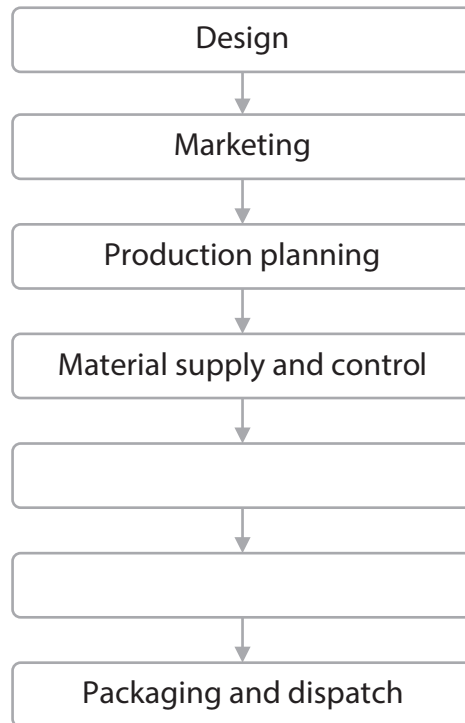
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9 (a) The incomplete flow diagram below indicates some of the main stages in manufacturing.

(i) Complete the flow diagram by adding the **two** missing stages in manufacturing.

(2)



(ii) State the stage in manufacturing where the drawings for the packaging of the frozen puff pastry sheets are created.

(1)

Stage

(b) List **three** activities carried out at the marketing stage when manufacturing the frozen puff pastry sheets.

(3)

- 1 .....
- 2 .....
- 3 .....



(c) Describe the packaging and dispatch stage when manufacturing the frozen puff pastry sheets.

(3)

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**(Total for Question 9 = 9 marks)**

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10 (a) State a modern emulsifier commonly used in the frozen puff pastry sheets. (1)

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(b) Lamination is one of the processes used during the manufacture of frozen puff pastry sheets.

(i) State **three** production processes, other than lamination, used during the manufacture of frozen puff pastry sheets. (3)

Process 1

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Process 2

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Process 3

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(ii) Explain why lamination is a suitable process to use during the manufacture of frozen puff pastry sheets. (3)

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(c) Explain how the use of modern materials has helped manufacturers of frozen puff pastry sheets to increase sales.

(3)

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

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11 Automation is used in the manufacture of mass produced frozen puff pastry sheets.

(a) Explain the term **automation**.

(2)

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(b) (i) Describe **three** different examples of automation used in the production stage of the manufacture of frozen puff pastry sheets.

(6)

1 .....

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2 .....

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3 .....

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(ii) Explain **one** disadvantage to the manufacturer of applying a type of automation when manufacturing frozen puff pastry sheets.

(2)

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(iii) Explain **one** benefit to the consumer of applying a type of automation when manufacturing frozen puff pastry sheets.

(2)

.....

.....

**(Total for Question 11 = 12 marks)**



12 (a) The introduction of modern technology has an impact on safety and efficiency when manufacturing mass produced frozen puff pastry sheets.

(i) State **two** benefits the introduction of modern technology has had for the safety of the workforce.

(2)

1 .....

2 .....

(ii) Explain **two** effects the introduction of modern technology has had on the efficiency of the production process.

(4)

1 .....

2 .....

(b) The introduction of modern technology when manufacturing frozen puff pastry sheets has an impact on the global environment.

Explain **two** advantages the use of modern technology has had for the global environment.

(4)

1 .....

2 .....

**(Total for Question 12 = 10 marks)**



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**13** Information and communications technology (ICT) is an essential feature in the manufacture of mass produced frozen puff pastry sheets.

Explain **two** impacts of ICT on the material supply and control stage in manufacturing.

1 .....

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2 .....

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**(Total for Question 13 = 4 marks)**



