

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 A: Printing and Publishing, Paper and Board**

Friday 23 May 2014 – Afternoon

**Time: 1 hour 30 minutes**

Paper Reference

**5EM03/3A**

**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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**PEARSON**

## 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 **printing and publishing** sector.

(2)

Products	Put a cross in <b>two</b> boxes below
Reward sticker	<input type="checkbox"/>
Computer keyboard	<input type="checkbox"/>
Event leaflet	<input type="checkbox"/>
Fabric bracelet	<input type="checkbox"/>
Drill set	<input type="checkbox"/>
Headache capsules	<input type="checkbox"/>

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

(2)

Products	Put a cross in <b>two</b> boxes below
Medium density fibreboard	<input type="checkbox"/>
School diary planner	<input type="checkbox"/>
Spray starch	<input type="checkbox"/>
Safety boots	<input type="checkbox"/>
Box file	<input type="checkbox"/>
Anti-static mat	<input type="checkbox"/>



(Total for Question 1 = 4 marks)



2 The tables below show some symbols often seen on packaging.

(a) Complete Table 1 by naming each symbol.


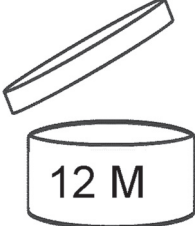
(2)

Symbol	Symbol name	Meaning
		Tells consumers that they have a responsibility to keep the environment around them litter free.
		Tells consumers that the manufacturer has paid a fee towards packaging recovery.

**Table 1**

(b) Complete Table 2 by explaining the meaning of each symbol.

(4)

Symbol	Symbol name	Meaning
	Fairtrade	
	Period-after-opening	

**Table 2**

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



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**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**

Electronic mail

Foil lined board

Corrugated card

Assembly robot

Composites

Social media

Continuous operation

Modern materials

Control technology

Information and  
communications  
technology (ICT)

**(Total for Question 3 = 7 marks)**



4 Food tray packaging belongs to the printing and publishing, paper and board sector and uses control technology and a printing process in its manufacture.

(a) Name **two other** products from this sector that use control technology and a printing process in their manufacture.

(2)

**Product 1**

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**Product 2**

.....

(b) (i) State **one** type of control technology used in the manufacture of **Product 1**.

(1)

(ii) Explain **two** different reasons why this type of control technology is used.

(4)

1 .....

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2 .....

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(c) (i) Name a printing process used in the manufacture of **Product 1**.

(1)

(ii) Briefly describe a printing process used in the manufacture of **Product 1**.

(2)

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



**5** Information and communication technology (ICT) and computer-aided manufacture (CAM) are both used by manufacturers of printing and publishing, paper and board products.

(a) Describe **one** example of how a manufacturer would use websites to reduce its costs.

(2)

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(b) As a result of high product demand, a manufacturer has changed from using traditional to computer-aided manufacturing (CAM) methods.

Describe **three** benefits of this change for the manufacturer.

(6)

1 .....

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2 .....

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3 .....

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**(Total for Question 5 = 8 marks)**





6 (a) Communications technologies are widely used by manufacturers of printing and publishing, paper and board products. Email is an example of an electronic communications technology.

(i) Name **two other** examples of an electronic communications technology. (2)

1 .....

2 .....

(ii) A customer needs products to be made urgently. Describe **two** examples of how a manufacturer could make use of email in this situation. (4)

1 .....

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2 .....

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(b) In the paper and board sector, smart and modern materials are used in the manufacture of products.

(i) Name **one** smart material used in the paper and board sector. (1)

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(ii) Explain why finishes are applied to modern materials. (2)

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**(Total for Question 6 = 9 marks)**



**7** Handling information and data is an essential feature in printing and publishing, paper and board companies.

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

(a) Product sales

(3)

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(b) Production

(3)

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

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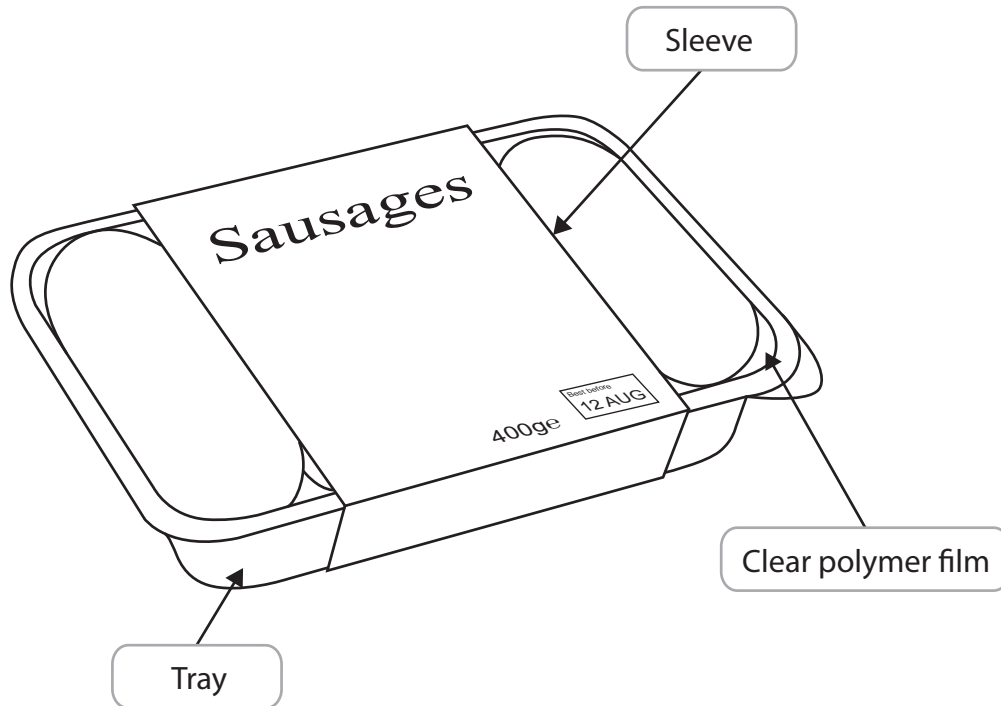
**TOTAL FOR SECTION A = 50 MARKS**



## SECTION B

Answer ALL questions in Section B with reference to the manufacture of mass produced food tray packaging.

The diagram below shows **food tray packaging**.



**8** Describe using notes and sketches:

(a) the function of the tray.

(3)

Tray

(b) the function of the clear polymer film.

(3)

Clear polymer film



(c) the function of the sleeve.

(3)

Sleeve

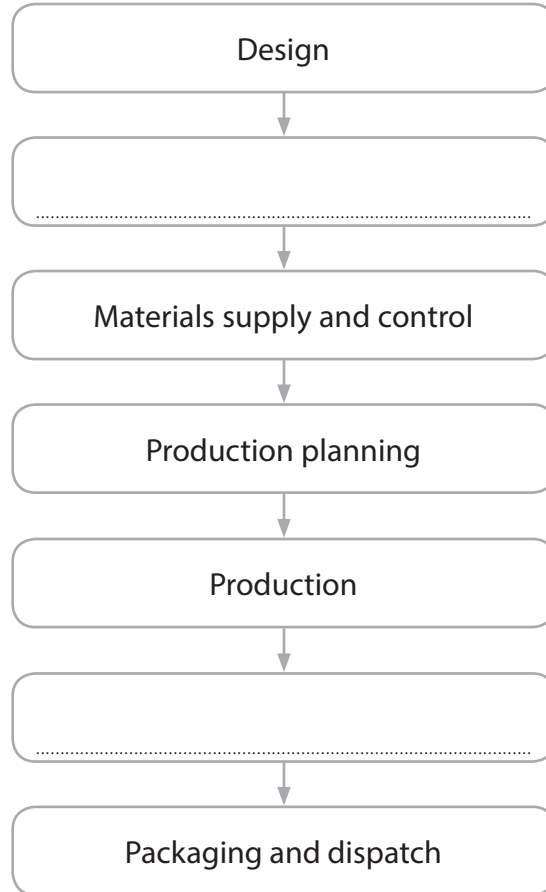
**(Total for Question 8 = 9 marks)**



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

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

(2)



(ii) State the stage in manufacturing where images and text are created for the sleeve.

(1)

Stage

(b) List **three** activities carried out at the materials supply and control stage when manufacturing food tray packaging.

(3)

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



(c) Describe the production planning stage when manufacturing food tray packaging.

(3)

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

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10 (a) State a specific material commonly used for the sleeve of the food tray packaging. (1)

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(b) Vacuum forming is a process used to produce the tray for food tray packaging.

(i) State **three** production processes, other than vacuum forming, used during the manufacture of food tray packaging. (3)

Process 1

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Process 2

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Process 3

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(ii) Explain why vacuum forming is a suitable process for making the tray. (3)

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(c) Explain how the use of modern materials has reduced the environmental impact of manufacturing food packaging trays.

(3)

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



**11** Information and communication technology (ICT) plays an important role in the manufacture and sales of food tray packaging.

(a) (i) State **two** uses of ICT at the design stage.

(2)

1 .....

2 .....

(ii) Describe **two** uses of ICT in the packaging and dispatch stage.

(4)

1 .....

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2 .....

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(b) Explain **one** benefit of the use of ICT to the distributor of food tray packaging.

(2)

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(c) Explain the impact ICT has on the design, development and production of food tray packaging.

(4)

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

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**12** A manufacturer of food tray packaging is considering increasing its use of automation. It is aware that an increase in its use of automation will have an impact on the workforce and working environment.

(a) Explain **two** different effects the increased use of automation will have on the workforce.

(4)

1 .....

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2 .....

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(b) Explain **two** benefits the increased use of automation will have on the working environment.

(4)

1 .....

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2 .....

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(c) State **two** other issues that the manufacturer should consider, other than the impact on the workforce and working environment.

(2)

1 .....

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2 .....

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



**13** Most modern production processes generate heat.

Explain how waste heat can be used by a manufacturer of food tray packaging.

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



\*14 Discuss the benefits of using 'just-in-time' techniques when manufacturing food tray packaging.

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**(Total for Question 14 = 6 marks)**

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**TOTAL FOR SECTION B = 60 MARKS**  
**TOTAL FOR PAPER = 110 MARKS**



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