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**Pearson  
Edexcel GCSE**

Centre Number

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**

Monday 21 May 2018 – 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

### **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 in a box . 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 |
|---------------------|---------------------------------------|
| Toothpaste          | <input type="checkbox"/>              |
| Supermarket receipt | <input type="checkbox"/>              |
| Mechanics vice      | <input type="checkbox"/>              |
| Magazine            | <input type="checkbox"/>              |
| Cycling shorts      | <input type="checkbox"/>              |
| Shampoo             | <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 |
|----------------------|---------------------------------------|
| Satellite navigation | <input type="checkbox"/>              |
| File dividers        | <input type="checkbox"/>              |
| MicroSD card         | <input type="checkbox"/>              |
| Road barrier         | <input type="checkbox"/>              |
| Curry powder         | <input type="checkbox"/>              |
| Birthday card        | <input type="checkbox"/>              |

**(Total for Question 1 = 4 marks)**

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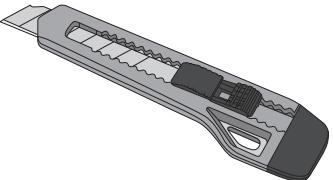
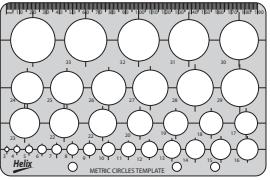
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2 The tables below show some equipment and symbols used during the manufacture of printing and publishing, paper and board products.

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

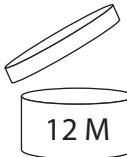
(2)

| Equipment   | Equipment name | Use  |
|---|----------------|--|
|  |                | For precision cutting or scoring of paper or card.     |
|  |                | For drawing circles of different diameters accurately. |

**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)**

P 5 5 5 5 7 A 0 3 2 0

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**

Solid whiteboard

**Key Area**

Modern materials

Internet

Word processing

Control technology

Hydrochromic ink

Remote operated vehicles (ROVs)

Information and communications  
technology (ICT)

Integrated manufacturing  
systems

Low density polyethylene (LDPE)

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

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4 Recipe card stands belong to the printing and publishing, paper and board sector and use automation and modern materials in their manufacture.

(a) Name **two** other products from this sector that use automation in their manufacture.

(2)

Product 1

Product 2

(b) (i) Name **one** type of automation used in the manufacture of products from this sector.

(1)

(ii) Explain **two** different reasons why the automation named in 4(b)(i) is used.

(4)

1

2



5 5 5 5 7 A 0 5 2 0

(c) (i) Name **one** modern material used in the manufacture of a product from this sector.

(1)

(ii) Describe how the modern material named in 4(c)(i) changes the characteristics of a product from this sector.

(2)

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

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5 Computer-aided manufacture (CAM) and computer-aided design (CAD) are both used by manufacturers of printing and publishing, paper and board products.

(a) Using CAM can reduce the product price for the consumer.

Describe **one other** benefit to the consumer of using CAM.

(2)

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(b) Using CAD speeds up the design process for the manufacturer.

Describe **three other** advantages of using CAD during the design process.

(6)

1

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2

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3

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



6 Communications technology is widely used by manufacturers of printing and publishing, paper and board products.

(a) (i) Describe the communications technology 'Bluetooth'.

(2)

.....  
.....  
.....  
.....

(ii) Explain **one** advantage to a manufacturer of using video conferencing.

(2)

.....  
.....  
.....  
.....

(b) Electronic Point of Sale (EPOS) is also an example of communications technology.

(i) Name a traditional method it has replaced.

(1)

.....  
.....  
.....  
.....

(ii) Explain **two** advantages to a manufacturer of using EPOS.

(4)

1 .....  
.....  
.....  
.....

2 .....  
.....  
.....  
.....

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



7 Systems and control technology, including the use of programmable logic controllers (PLCs), is an essential feature of printing and publishing, paper and board companies.

Explain **one** benefit to a manufacturer of using PLCs in relation to:

(a) production efficiency

(3)

(b) safety during manufacture.

(3)

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

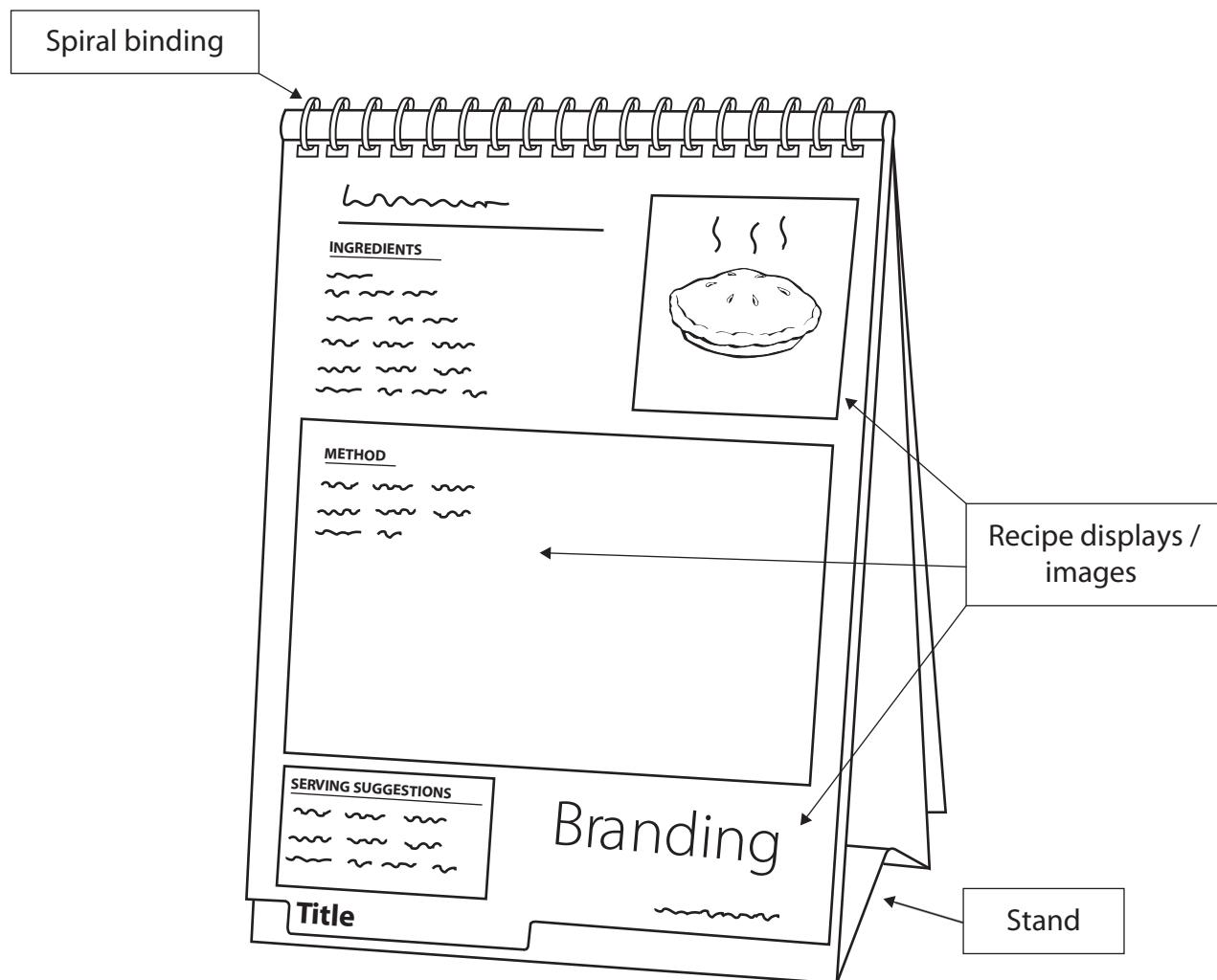
**TOTAL FOR SECTION A = 50 MARKS**



## SECTION B

**Answer ALL questions in Section B with reference to the manufacture of mass produced recipe card stands.**

The diagram below shows a recipe card stand.



**8** Describe, using notes and sketches:

(a) the function of the recipe displays / images

(3)

recipe displays / images

(b) the function of the spiral binding

(3)

spiral binding



(c) the function of the stand.

(3)

stand

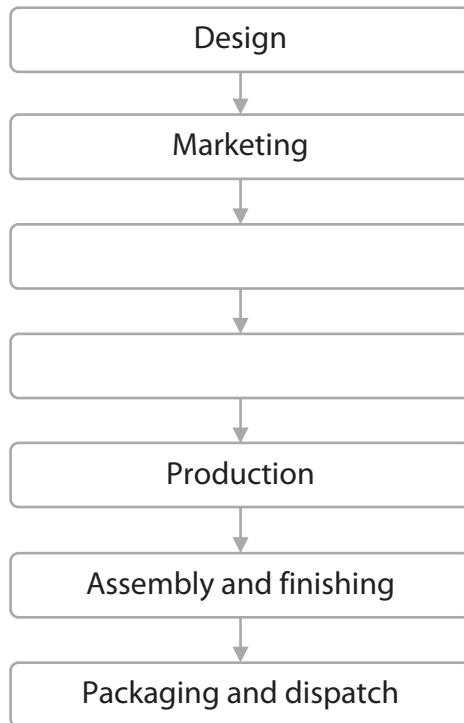
**(Total for Question 8 = 9 marks)**



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 stand would be made.

(1)

Stage

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(b) List **three** activities carried out at the design stage when manufacturing recipe card stands.

(3)

1 .....

2 .....

3 .....

(c) Describe the marketing stage when manufacturing recipe card stands.

(3)

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



**10** (a) Steel is used to make the spiral binding for the recipe card stand.

State **one other** specific material commonly used for the recipe card stand.

(1)

(b) Web-fed offset lithography is one of the processes used during the manufacture of recipe card stands.

(i) State **three** production processes, other than web-fed offset lithography, used during the manufacture of the recipe card stand.

(3)

Process 1

Process 2

Process 3

(ii) Explain why web-fed offset lithography is a suitable process to use during the manufacture of recipe card stands.

(3)

(c) Explain why steel is an appropriate material for the spiral binding on the recipe card stand.

(3)

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



**11** Quality control is used when manufacturing mass produced recipe card stands.

(a) Explain the term 'quality control'.

(2)

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(b) (i) Describe **three** different examples of quality control procedures used in the production stage when manufacturing recipe card stands.

(6)

1 .....

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2 .....

.....

3 .....

.....

(ii) Explain **one** disadvantage to the manufacturer of using quality control when manufacturing recipe card stands.

(2)

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.....

.....

(iii) Explain **one** benefit to the consumer of using quality control when manufacturing recipe card stands.

(2)

.....

.....

.....

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



12 (a) The use of modern technology in the manufacture of mass produced recipe card stands has brought changes.

(i) State **two** positive changes the use of modern technology has had on the working environment.

(2)

1 .....

2 .....

(ii) Explain **two** effects the use of modern technology has had on the efficiency of the packaging and dispatch stage.

(4)

1 .....

2 .....

(b) The use of modern technology when manufacturing recipe card stands has had an impact on the workforce.

Explain **two** disadvantages the use of modern technology has had on the workforce.

(4)

1 .....

2 .....

(Total for Question 12 = 10 marks)



**13** The use of 'just in time' (JIT) techniques when manufacturing mass produced recipe card stands has brought changes.

Explain the effects of these changes for the manufacturer.

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



**\*14** Discuss the impact of the use of modern technologies on the sustainable manufacture of recipe card stands.

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

**TOTAL FOR SECTION B = 60 MARKS**

**TOTAL FOR PAPER = 110 MARKS**



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