

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

Wednesday 24 May 2017 – Morning

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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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 two boxes below
Electric drill	<input type="checkbox"/>
Tea towel	<input type="checkbox"/>
Soldering iron	<input type="checkbox"/>
Tea cake	<input type="checkbox"/>
Instruction manual	<input type="checkbox"/>
Greeting card	<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 two boxes below
Plasterboard fixing	<input type="checkbox"/>
Self-adhesive label	<input type="checkbox"/>
Moisturiser	<input type="checkbox"/>
Envelope	<input type="checkbox"/>
Tank cutter	<input type="checkbox"/>
Endoscope	<input type="checkbox"/>

(Total for Question 1 = 4 marks)

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

(a) Complete Table 1 by naming each item.

(2)

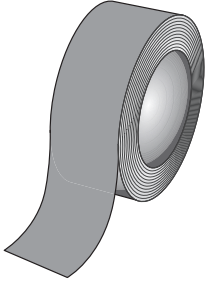
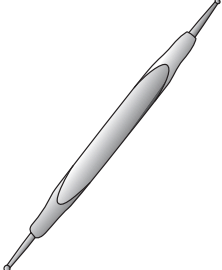
Item	Item name	Use
		Used for joining, sealing, attaching or mending and can be used with a dispenser.
		Used to create raised or tooled lines in paper or card, and to produce a 3D effect to add interest.

Table 1

(b) Complete Table 2 by explaining what each item is used for.

(4)

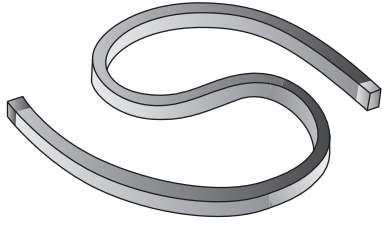

Item	Item name	Use
	Flexi-curve	
	T-square	

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

High impact polystyrene (HIPS)

Database

Control technology

Mounting board

Conveyor systems

Information and communications
technology (ICT)

Photochromic card

Virtual learning environment
(VLE)

(Total for Question 3 = 7 marks)



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4 (a) Finishing processes are used when manufacturing toy figure packaging in the printing and publishing, paper and board sector.

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

(2)

Product 1

Product 2

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

(2)

Finishing process 1

Finishing process 2

(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 printing and publishing, paper and board sector.

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

(4)

1

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.....

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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 printing and publishing, paper and board products.

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

(1)

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.....

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

(2)

.....

.....

.....

(b) Embedded computers are used by manufacturers of printing and publishing, paper and board 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 printing and publishing, paper and board 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)

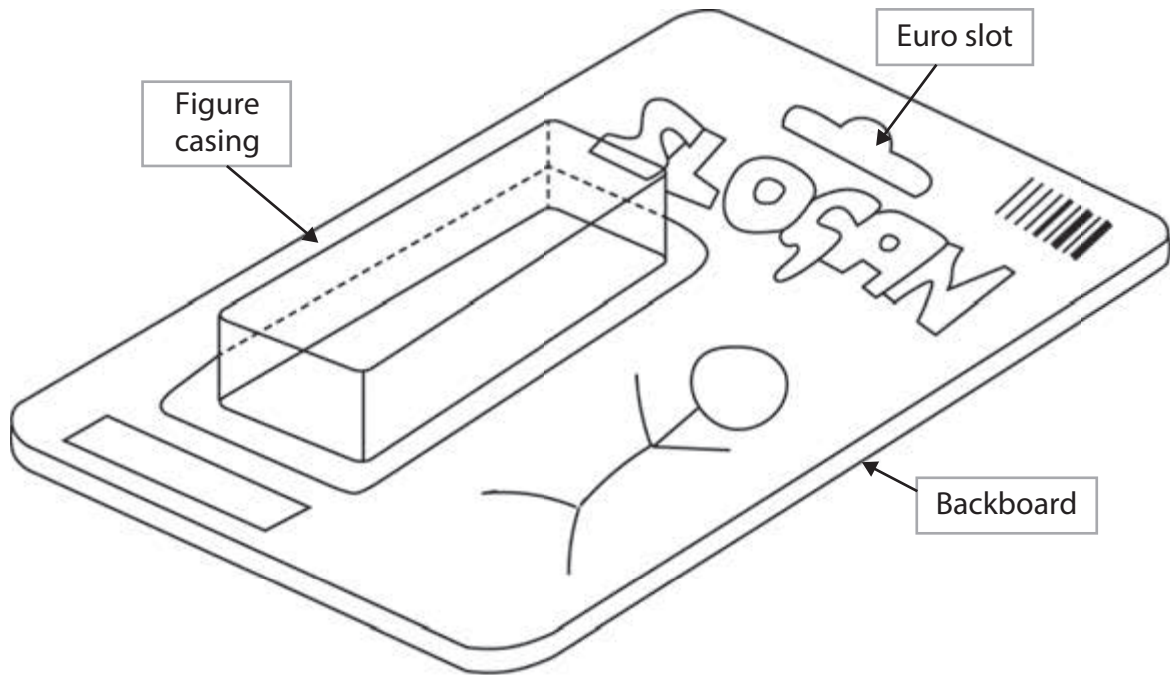
TOTAL FOR SECTION A = 50 MARKS



SECTION B

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

The diagram below shows toy figure packaging.



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8 Describe, using notes and sketches:

(a) the function of the euro slot

(3)

euro slot

(b) the function of the backboard

(3)

backboard



(c) the function of the figure casing

(3)

figure casing

(Total for Question 8 = 9 marks)

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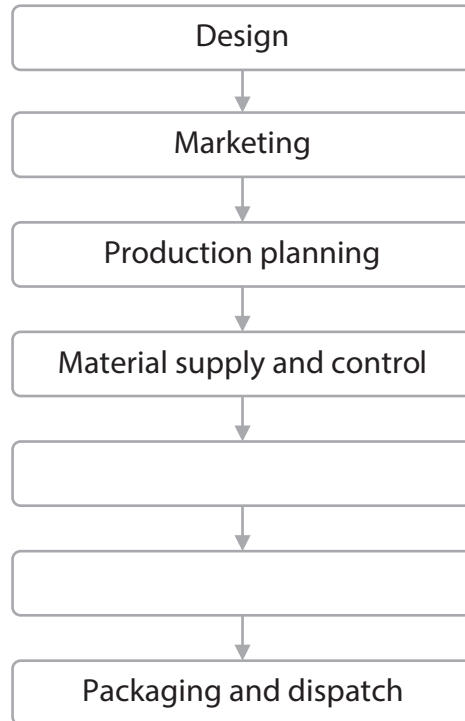
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9 (a) The incomplete flow diagram below indicates some of the main stages in manufacturing.

(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 toy figure packaging are created.

(1)

Stage

(b) List **three** activities carried out at the marketing stage when manufacturing the toy figure packaging.

(3)

- 1
- 2
- 3



(c) Describe the packaging and dispatch stage when manufacturing the toy figure 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 backboard of toy figure packaging. (1)

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(b) Vacuum forming is one of the processes used during the manufacture of toy figure packaging.
(i) State **three** production processes, other than vacuum forming, used during the manufacture of toy figure 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 to use during the manufacture of toy figure packaging. (3)

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(c) Explain how the use of modern materials has helped manufacturers of toy figure packaging 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 toy figure packaging.

(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 toy figure packaging.

(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 toy figure packaging.

(2)

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(iii) Explain **one** benefit to the consumer of applying a type of automation when manufacturing toy figure packaging.

(2)

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(Total for Question 11 = 12 marks)



12 (a) The introduction of modern technology has an impact on safety and efficiency when manufacturing mass produced toy figure packaging.

(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 toy figure packaging 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 toy figure packaging.

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)



***14** Discuss how manufacturers monitor and control energy consumption when manufacturing toy figure packaging.

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(Total for Question 14 = 6 marks)

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

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