

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCSE

**Manufacturing (Double Award)
Engineering (Double Award)
Unit 3: Application of Technology in
Engineering and Manufacturing
Paper A: Printing and Publishing, Paper and Board**

Monday 16 May 2011 – 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** the 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)

Supermarket receipt	<input type="checkbox"/>
Perfume	<input type="checkbox"/>
Welding hearth	<input type="checkbox"/>
Toaster	<input type="checkbox"/>
Business card	<input type="checkbox"/>
Computer mouse	<input type="checkbox"/>

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

(2)

Table cloth	<input type="checkbox"/>
Recycled envelope	<input type="checkbox"/>
Hardwood decking board	<input type="checkbox"/>
Rollerball pen	<input type="checkbox"/>
Car phone holder	<input type="checkbox"/>
Repositionable sticky notes	<input type="checkbox"/>

(Total for Question 1 = 4 marks)

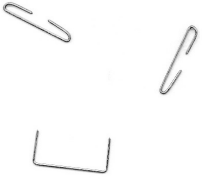



2 The tables below show some items and symbols used during the manufacture of paper or board products.

(a) Complete Table 1 by naming each item.

(2)

Table 1

Item	Item name	Use
		A two-pronged fastener used for joining or binding paper or board together.
		Used to apply an ink image or pattern onto a piece of paper or board.

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

(4)

Table 2

Symbol	Symbol name	Meaning
©	Copyright	
TM	Trademark	

(Total for Question 2 = 6 marks)



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

Each Key Area can be used more than once.

Term	Key Area
Bluetooth	
Robotics	Modern materials
Polypropylene (PP)	
Coated card	Control technology
Video conferencing	
Computer aided manufacture (CAM)	Information and communications technology (ICT)
Polyvinyl chloride (PVC)	

(Total for Question 3 = 7 marks)



4 Shoe box packaging belongs to the printing and publishing, paper and board sector.

(a) Name **two** other products from this sector, apart from shoe box packaging, that utilise modern materials in their manufacture.

(2)

1

2

(b) (i) State **one** modern material used in the manufacture of a product you named in 4(a).

(1)

.....

(ii) Explain **two** benefits to the **manufacturer** of using the modern material named in 4(b)(i).

(4)

1

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2

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(c) (i) State **two** smart materials used in the printing and publishing, paper and board sector.

(2)

1

2

(ii) Describe the characteristics of **one** smart material named in 4(c)(i).

(2)

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(Total for Question 4 = 11 marks)



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

(a) Describe why a **manufacturer** would use CAD rather than traditional methods. (2)

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(b) (i) State **two** benefits to the **manufacturer** of using CAM. (2)

1

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2

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(ii) Explain **two** benefits to the **retailer** when the manufacturer uses CAD and CAM. (4)

1

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2

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(Total for Question 5 = 8 marks)



6 Systems and control technologies are widely used by manufacturers of paper and board products.

(a) Explain the term 'systems and control technology'.

(2)

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(b) Robotics is an example of a systems and control technology.

(i) Name **one** other example of a systems and control technology.

(1)

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(ii) Name the traditional method this has replaced.

(1)

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(iii) Explain **two** benefits of using robotics in hazardous conditions.

(4)

1

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2

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(Total for Question 6 = 8 marks)



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

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

(a) marketing

(3)

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(b) materials supply.

(3)

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(Total for Question 7 = 6 marks)

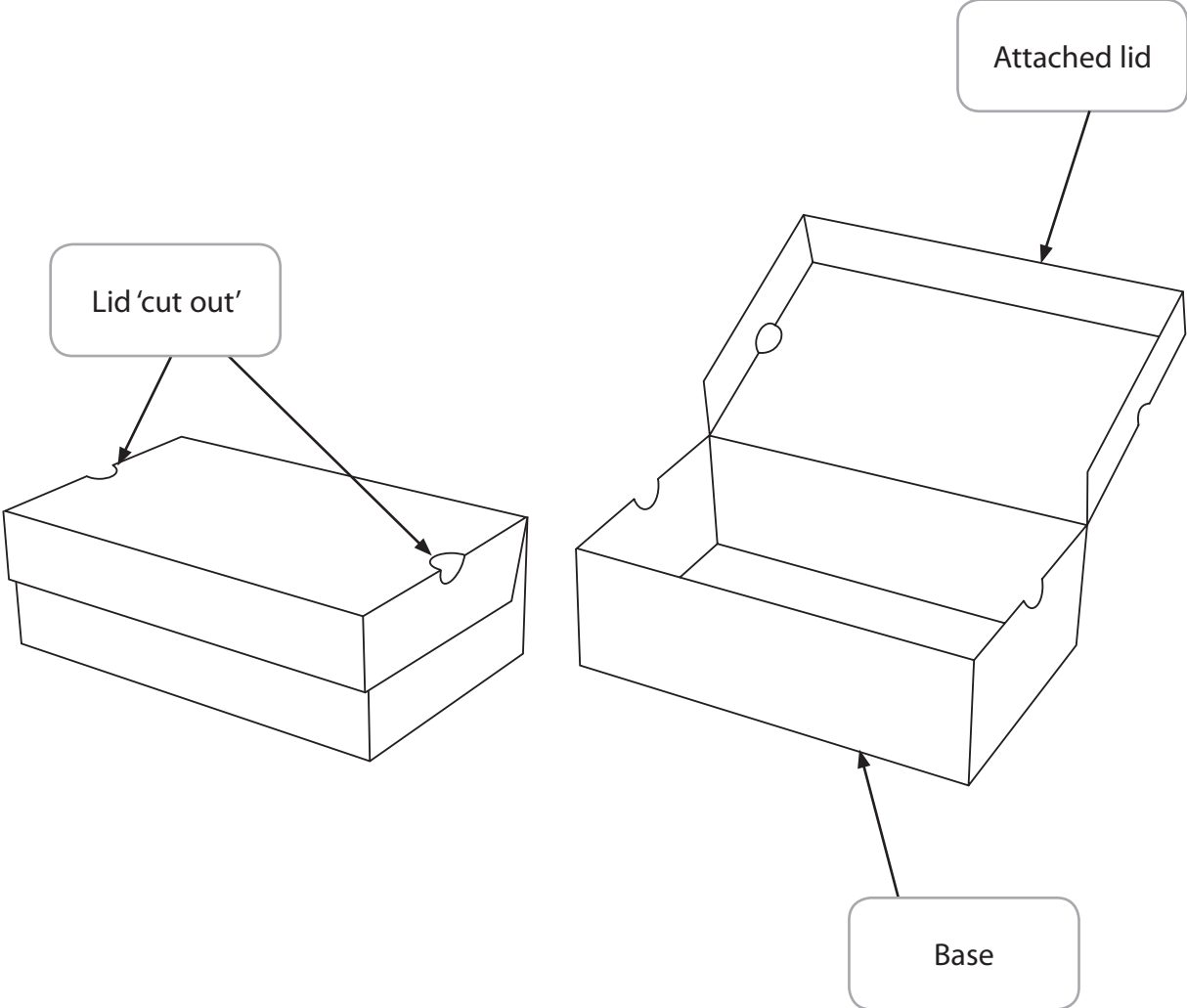
TOTAL FOR SECTION A = 50 MARKS



SECTION B

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

The diagram below shows some shoe box packaging.



8 Describe, using notes and sketches:

(a) the function of the base

(3)

Base

(b) the function of the attached lid

(3)

Attached lid



(c) the function of the lid 'cut out'.

(3)

Lid 'cut out'

(Total for Question 8 = 9 marks)



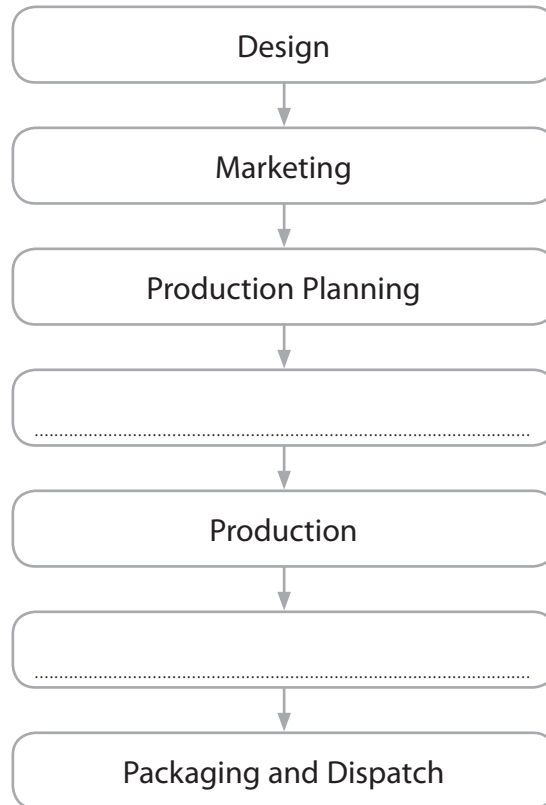
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9 (a) The incomplete flow diagram below indicates some of the main stages in manufacturing shoe box packaging.

(i) Complete the flow diagram by writing the **two** missing main stages in manufacturing shoe box packaging.

(2)



(ii) State the stage where the shoe box packaging would be advertised on websites.

(1)

Stage



(b) Describe the following **two** stages in the manufacture of shoe box packaging.

(i) Production planning

(3)

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(ii) Packaging and dispatch

(3)

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(Total for Question 9 = 9 marks)



10 (a) State a specific material commonly used for shoe box packaging.

(1)

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(b) Flexography is used to print onto the surface of the shoe box packaging.

(i) State **three** production processes, other than flexography, used during the manufacture of shoe box packaging.

(3)

Process 1

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Process 2

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Process 3

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(ii) Explain why flexography is a suitable process for printing onto the surface of the shoe box packaging.

(3)

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(c) Explain how the use of modern materials has helped the manufacturer of shoe box packaging to increase sales.

(3)

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(Total for Question 10 = 10 marks)



11 Automation is used in the manufacture of shoe box packaging.

(a) Explain the term 'automation'.

(2)

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(b) (i) Describe **two** examples of automation used at the production stage of the manufacture of shoe box packaging.

(4)

1

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2

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(ii) Explain **one** benefit to the **manufacturer** of applying a type of automation described in 11(b)(i).

(2)

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(iii) Explain **one** benefit to the **consumer** of applying a type of automation described in 11(b)(i).

(2)

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(c) Explain the difference between automation and mechanisation.

(2)

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(Total for Question 11 = 12 marks)



12 Communications technology and quality control play an important role in the manufacture of shoe box packaging.

(a) (i) State **two** types of communications technology used at the **design** stage when manufacturing shoe box packaging.

(2)

1

2

(ii) Using an example from 12(a)(i), describe **one** benefit of the use of communications technology at the **design** stage.

(2)

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(b) During the manufacture of shoe box packaging, physical damage quality checks are carried out.

(i) State **one** other quality check used during the **production** stage.

(1)

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(ii) Describe how the quality check stated in 12(b)(i) would be carried out.

(2)

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(iii) Explain the benefits of the use of quality control to the shoe box packaging end user.

(3)

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(Total for Question 12 = 10 marks)



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