

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**

Wednesday 15 May 2013 – 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 the products 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)

Cod liver oil	<input type="checkbox"/>
Instruction manual	<input type="checkbox"/>
Brake calliper	<input type="checkbox"/>
Pasta sauce	<input type="checkbox"/>
Aluminium frame	<input type="checkbox"/>
Birthday card	<input type="checkbox"/>

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

(2)

E-book reader	<input type="checkbox"/>
Metal curtain rail	<input type="checkbox"/>
Fuel cap	<input type="checkbox"/>
Toilet roll	<input type="checkbox"/>
Recycled envelopes	<input type="checkbox"/>
Beach sandals	<input type="checkbox"/>

(Total for Question 1 = 4 marks)



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)


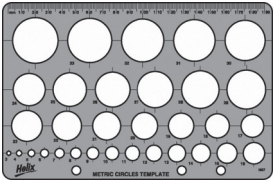
Item	Item name	Use
		<p>For precision cutting or scoring of paper or card.</p>
		<p>For drawing circles of different diameters accurately.</p>

Table 1

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

(4)

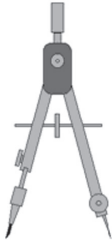

Item	Item name	Use
	<p>Pair of compasses</p>	
	<p>T-square</p>	

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

Computer-aided design

Automated conveyors

Hydrochromic ink

Embedded computers

3D prototyping

Duplex board

Polyvinyl acetate (PVA)

Information and
communication technology
(ICT)

Control technology

Modern materials

(Total for Question 3 = 7 marks)



4 School diary planners belong to the printing and publishing, paper and board sector and use information and communication technology (ICT) in their manufacture.

(a) Name **two other** products from this sector where ICT is used in their manufacture. (2)

Product 1

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Product 2

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(b) (i) Name **one stage** where ICT is used in the manufacture of **Product 1**. (1)

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(ii) Explain **two** benefits to a **manufacturer** of using ICT at the stage named in 4(b)(i). (4)

1

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2

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(c) (i) Name **one modern material** used in the manufacture of **Product 1**.

(1)

(ii) Describe how this modern material changes the characteristics of **Product 1**.

(2)

(Total for Question 4 = 10 marks)



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

(a) (i) State **one** use of CAM during manufacturing.

(1)

(ii) Explain **one** benefit to a manufacturer of using CAM in processing and production.

(2)

CAD is used when modifying existing products.

(b) (i) State **one other** use of CAD during manufacturing.

(1)

(ii) Explain **one** benefit to a **manufacturer** of using CAD when modifying existing products.

(2)

(c) Explain **one** benefit to the **consumer** when a manufacturer uses CAM.

(2)

(Total for Question 5 = 8 marks)



6 Sourcing and handling information and data is important to manufacturers.

(a) Describe the term **spreadsheet**.

(2)

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(b) A database is also an example of sourcing and handling information and data.

(i) State **one** traditional method it has replaced.

(1)

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(ii) Explain **two advantages** to the **distributor** when a manufacturer uses databases.

(4)

1

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2

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(iii) Explain **one disadvantage** to a **manufacturer** of using databases.

(2)

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(Total for Question 6 = 9 marks)



7 Systems and control technology is an essential feature in printing and publishing, paper and board companies.

Explain **one** benefit to a manufacturer of using programmable logic controllers (PLCs) in relation to:

(a) safety during manufacture

(3)

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(b) production efficiency.

(3)

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(Total for Question 7 = 6 marks)

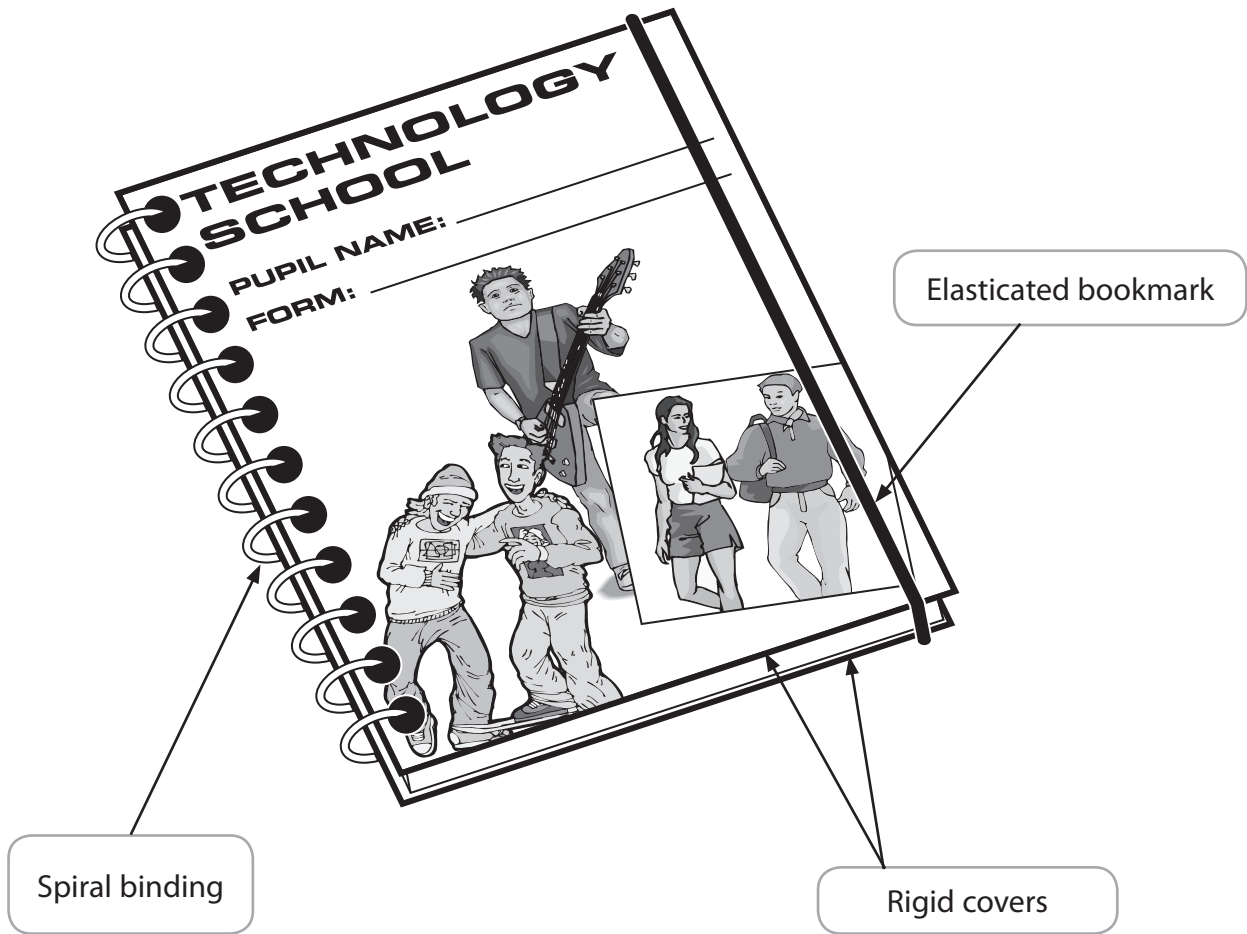
TOTAL FOR SECTION A = 50 MARKS



SECTION B

Answer ALL questions in Section B with reference to the manufacture of mass-produced school diary planners.

The diagram below shows a school diary planner.



8 Describe, using notes and sketches:

(a) the function of the spiral binding

(3)

Spiral binding

(b) the function of the rigid covers

(3)

Rigid covers



(c) the function of the elasticated bookmark

(3)

Elasticated bookmark

(Total for Question 8 = 9 marks)

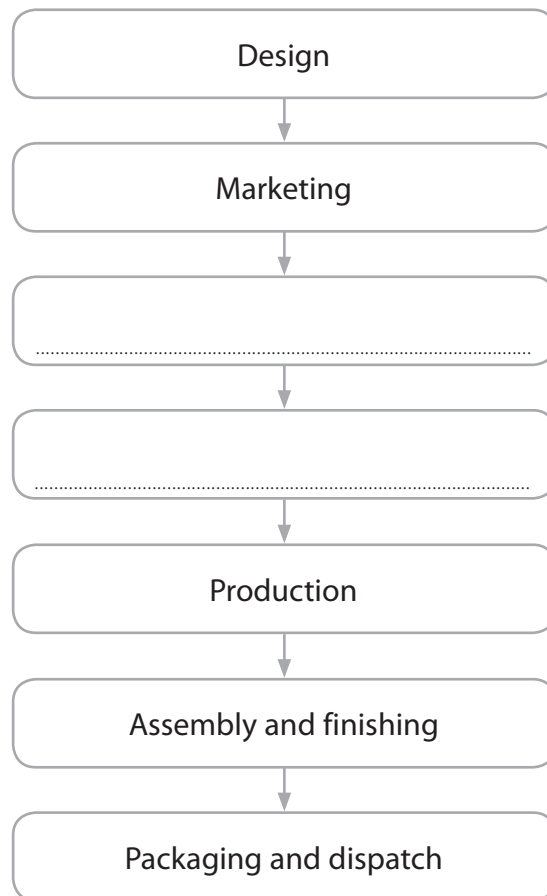


P 4 2 1 2 0 A 0 1 3 2 4

9 (a) The incomplete flow diagram below indicates some of the main stages in the manufacture of school diary planners.

(i) Complete the flow diagram by adding the **two** missing main stages in the manufacture of school diary planners.

(2)



(ii) State the stage where the school diary planners would be placed into cardboard boxes.

(1)

Stage



(b) Describe the following **two** stages in the manufacture of school diary planners.

(i) Design

(3)

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(ii) Marketing

(3)

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(Total for Question 9 = 9 marks)



10 (a) Modern materials are used in the manufacture of school diary planners.

(i) Apart from steel, state a **specific** material commonly used for the school diary planner.

(1)

(ii) Explain why steel is an appropriate material to use for the spiral binding on the school diary planner.

(3)

(b) Punching and binding are processes used to manufacture mass-produced school diary planners.

(i) State **three** production processes, **other than** punching and binding, used during the manufacture of school diary planners.

(3)

Process 1

Process 2

Process 3



(ii) Explain why punching is a suitable process for making the rigid plastic cover of the school diary planner.

(3)

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(Total for Question 10 = 10 marks)



11 Process control and quality control are used in the manufacture of school diary planners.

(a) (i) Explain the term **process control**.

(2)

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(ii) Explain **two** reasons why a **manufacturer** uses process control during automated stages of manufacture.

(4)

1

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2

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(b) Describe **two** examples of quality control used during the **production** stage of the manufacture of school diary planners.

(4)

1

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2

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(Total for Question 11 = 10 marks)



12 (a) The use of modern technology in the manufacture of mass-produced school diary planners has brought changes.

(i) State **two** changes the use of modern technology has had on the **type** of workforce manufacturers require.

(2)

Change 1

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Change 2

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(ii) Describe **two** changes the use of modern technology has had on the production environment.

(4)

Change 1

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Change 2

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(iii) Explain **one** environmental benefit that has resulted from the use of modern technology.

(2)

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(b) The use of barcodes is an important part of control technology in the manufacture of school diary planners.

Describe the advantages to a **manufacturer** of using barcodes at the packaging and dispatch stage.

(4)

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(Total for Question 12 = 12 marks)



13 Modern materials are used in the manufacture of school diary planners.

Explain how the use of modern materials has impacted on customer satisfaction.

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(Total for Question 13 = 4 marks)



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