Write your name here

Surname	Other names

Pearson Edexcel GCSE

Centre Number	Candidate Number

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

Tuesday 24 May 2016 – 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

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.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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1/1/1/1

P 4 6 5 3 2 A 0 1 2 0

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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 **two** boxes below
Mustard	☒
Gym bag	☒
Hairdryer	☒
Train ticket	☒
A4 diary	☒
Ring spanner	☒

(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
Bluetooth speaker	☒
Ringbinder	☒
Sun cream	☒
Recycled envelope	☒
Bolt cutter	☒
Dishwasher powder	☒

(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)

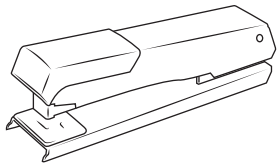
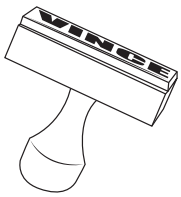
Item	Item name	Use
		A device used to join together sheets of paper or other items, permanently.
		Used to apply an ink image or pattern onto a piece of paper or board.

Table 1

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

(4)

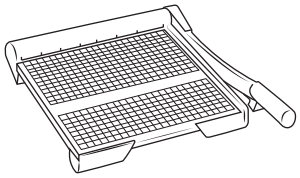
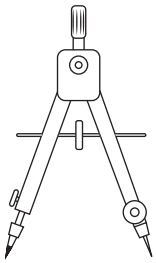
Item	Item name	Use
	Guillotine	
	Pair of compasses	

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
Thermostat	
Voice over internet protocol	Modern materials
Thermochromic ink	
Coated card	Control technology
Programmable logic controllers (PLCs)	
Foil lined board	Information and communications technology (ICT)
Video conferencing	

(Total for Question 3 = 7 marks)

4 Suspension files belong to the paper and board sector and use a printing process and automation in their manufacture.

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

(2)

Product 1

.....

Product 2

.....

(b) (i) Name a type of printing process used in the manufacture of a product you named in 4(a).

(1)

.....

(ii) Describe the printing process used in the manufacture of a product you named in 4(a).

(3)

.....

.....

.....

.....

.....

(c) Describe **two** examples of automation used in the manufacture of a product you named in 4(a).

(4)

1 .....

.....

.....

2 .....

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(Total for Question 4 = 10 marks)

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

(a) State **two** functions of a computer-aided design (CAD) system.

(2)

1 .....

.....

2 .....

.....

(b) A manufacturer has changed from using traditional design methods to computer-aided design (CAD).

Describe **one** disadvantage of this change for the manufacturer.

(2)

.....

.....

.....

(c) State **two** functions of a computer-integrated manufacturing (CIM) system.

(2)

1 .....

.....

2 .....

.....

(d) Explain **one** benefit of linking computer-aided design (CAD) and computer-integrated manufacturing (CIM) for the manufacturer.

(2)

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.....

.....

(Total for Question 5 = 8 marks)

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6 Information and data are important to manufacturers.

(a) (i) Describe the term **database**.

(3)

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

(2)

(b) Explain **two** reasons why a manufacturer would use an electronic spreadsheet.

(4)

1

2

(Total for Question 6 = 9 marks)

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

(a) Explain **one** benefit of using communications technology on the global environment.

(3)

(b) Other than environmental benefits, explain **one** advantage of using communications technology when marketing a product.

(3)

(Total for Question 7 = 6 marks)

TOTAL FOR SECTION A = 50 MARKS

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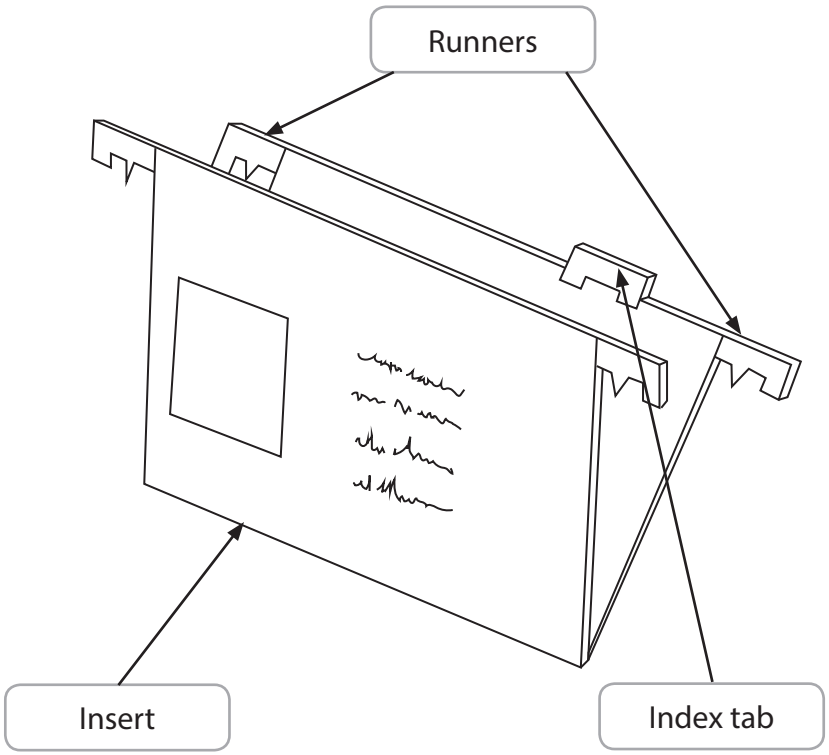
SECTION B

Answer ALL questions in Section B with reference to the manufacture of mass produced suspension files.

The diagram below shows a suspension file.



8 Describe, using notes and sketches:

(a) the function of the runners.

(3)

runners

(b) the function of the index tab.

(3)

index tab

(c) the function of the insert.

(3)

insert

(Total for Question 8 = 9 marks)

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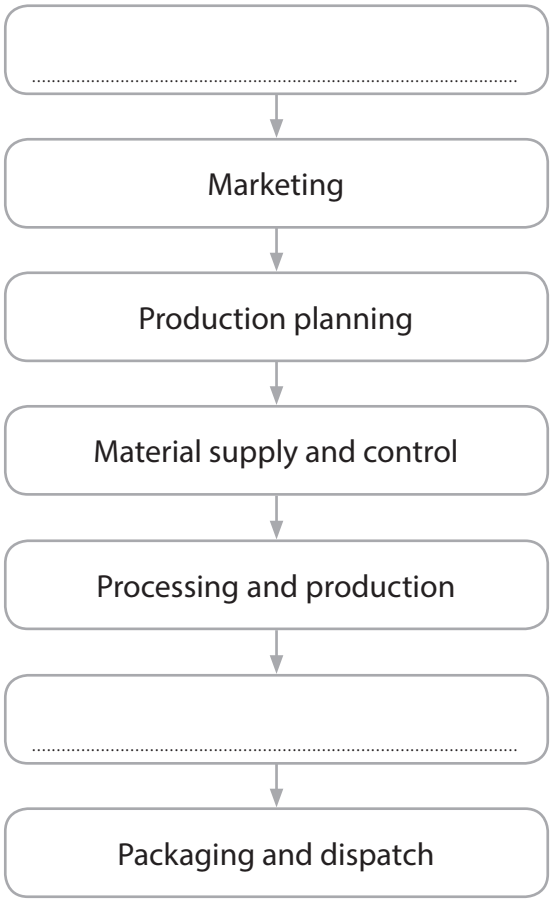
9 (a) The incomplete flow diagram below indicates some of the main stages in manufacturing suspension files.

(i) Complete the flow diagram by adding the **two** missing stages in manufacturing suspension files.

(2)



(ii) State the stage in manufacturing where the suspension files are advertised.

(1)

Stage .....

(b) List **three** activities carried out at the production planning stage when manufacturing suspension files.

(3)

1 .....

2 .....

3 .....

(c) Describe the materials supply and control stage when manufacturing suspension files.

(3)

.....

.....

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.....

.....

(Total for Question 9 = 9 marks)

10 (a) State a specific material commonly used for the inserts of suspension files.

(1)

.....

(b) Injection moulding is a process used to produce the index tab for suspension files.

(i) State **three** production processes, other than printing and injection moulding, used during the manufacture of suspension files.

(3)

Process 1

.....

Process 2

.....

Process 3

.....

(ii) Explain why injection moulding is a suitable process for making the index tab.

(3)

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(c) Explain how the use of modern materials has reduced the environmental impact of suspension files.

(3)

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(Total for Question 10 = 10 marks)

11 Computer-aided manufacture (CAM) and quality control are used in the manufacture of suspension files.

(a) State **two** reasons why computer-aided manufacture (CAM) is used at the production stage.

(2)

1 .....

2 .....

(b) Describe **three** quality control procedures carried out at the production stage.

(6)

1 .....

.....

.....

2 .....

.....

.....

3 .....

.....

.....

(c) Explain **two** benefits of using quality control at the production stage.

(4)

1 .....

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2 .....

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(Total for Question 11 = 12 marks)

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12 The introduction of modern technology and modern materials in the manufacture of mass produced suspension files has brought changes.

(a) (i) State **two** different changes the introduction of modern technology has had on the workforce.

(2)

1 .....

.....

2 .....

.....

(ii) Explain **two** different effects the introduction of modern technology has had on the working environment.

(4)

1 .....

.....

.....

2 .....

.....

.....

(b) Explain **two** different benefits modern materials have had on product characteristics and sales.

(4)

1 .....

.....

.....

2 .....

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(Total for Question 12 = 10 marks)

13 Control technology is an essential feature in the manufacture of suspension files.

Explain the impact of control technology on safety.

(Total for Question 13 = 4 marks)

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***14** Manufacturers of printing and publishing, paper and board products are increasingly using robotics.

Discuss the impact of robotics on production efficiency, product quality and manufacturing costs.

(Total for Question 14 = 6 marks)

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

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