

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 19 May 2015 – 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 ►

P44688A

©2015 Pearson Education Ltd.

1/1/1



PEARSON

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 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
Tea towel	<input type="checkbox"/>
Smartphone	<input type="checkbox"/>
Baking powder	<input type="checkbox"/>
ATM receipt	<input type="checkbox"/>
Birthday card	<input type="checkbox"/>
Barbecue	<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
Oil filter	<input type="checkbox"/>
Recipe book	<input type="checkbox"/>
Screwdriver	<input type="checkbox"/>
Shampoo	<input type="checkbox"/>
Ironing board	<input type="checkbox"/>
File dividers	<input type="checkbox"/>

(Total for Question 1 = 4 marks)



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 the equipment.

(2)

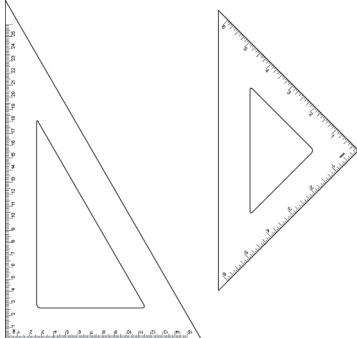
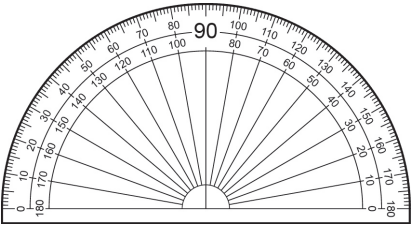
Equipment	Equipment name	Use
		Used with a pencil, drawing board and parallel motion to measure and produce accurate lines and intersections.
		Used with a pencil to measure, mark off or construct an angle in degrees.

Table 1

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

(4)


Symbol	Symbol name	Meaning
TM	Trademark	
	Copyright	

Table 2

(Total for Question 2 = 6 marks)



BLANK PAGE



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

Phosphorescent pigments

Presentation software

High density polyethylene (HDPE)

Automation systems

Cartridge paper

Wi-Fi

Computer-integrated engineering (CIE)

Modern materials

Control technology

Information and communications technology (ICT)

(Total for Question 3 = 7 marks)



4 Satellite navigation system packaging belongs to the printing and publishing, paper and board sectors and uses modern materials in its manufacture.

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

(2)

Product 1

Product 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 **consumer** of using this material.

(4)

1

2



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

(1)

(ii) Briefly describe the features of the smart material you named in 4(c)(i).

(2)

(Total for Question 4 = 10 marks)



5 Communications technology is widely used by manufacturers of printing and publishing, paper and board products. The internet is an example of communications technology.

(a) (i) Using an example, describe the term **internet**.

(3)

.....

.....

.....

.....

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

(2)

.....

.....

.....

(b) (i) Name **one** example, other than the internet, of a communications technology.

(1)

.....

(ii) Explain **one** benefit to the retailer of using the example named in 5(b)(i).

(2)

.....

.....

.....

.....

(Total for Question 5 = 8 marks)



6 Robotics and computer-integrated manufacturing systems (CIM) are used increasingly in printing and publishing, paper and board companies.

(a) (i) State **one** way in which robots may be used when manufacturing a printing and publishing, paper and board product.

(1)

.....
.....

(ii) Explain **two** disadvantages to a printing and publishing, paper and board manufacturer of using robotics.

(4)

1

.....
.....

2

.....
.....

(b) Describe **two** main features of a CIM system.

(4)

1

.....
.....

2

.....
.....

(Total for Question 6 = 9 marks)



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

(a) Describe how a manufacturer would use production planning and scheduling information at the materials supply and control stage.

(4)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(b) Explain **one** way that the use of information and data handling systems would benefit the manufacturer when marketing and selling products.

(2)

.....

.....

.....

.....

(Total for Question 7 = 6 marks)

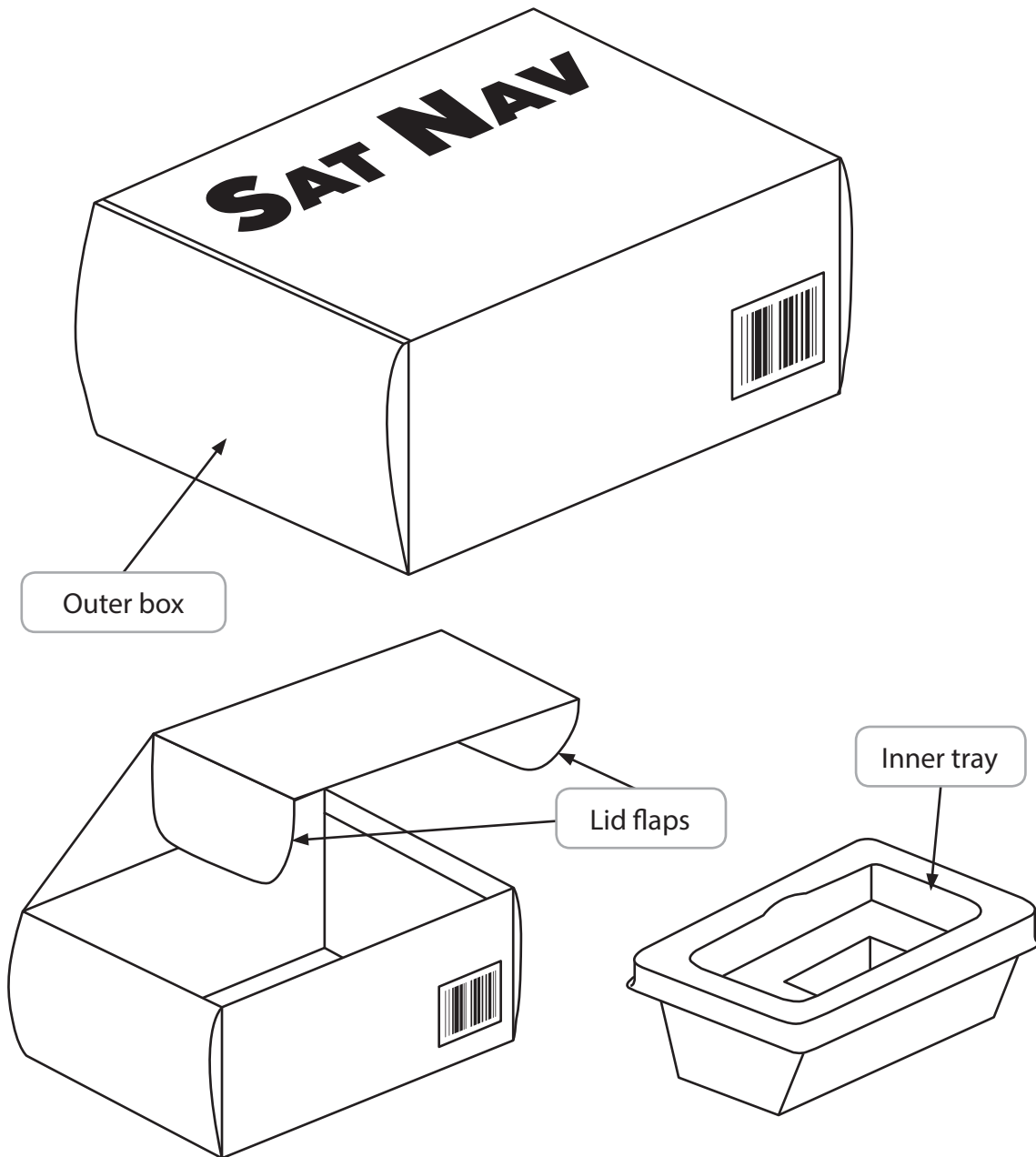
TOTAL FOR SECTION A = 50 MARKS



SECTION B

Answer ALL questions in section B with reference to the manufacture of mass produced satellite navigation system packaging.

The diagram below shows satellite navigation system packaging.



8 Describe, using notes and sketches:

(a) the function of the outer box

(3)

outer box

(b) the function of the inner tray

(3)

inner tray



(c) the function of the lid flaps.

(3)

lid flaps

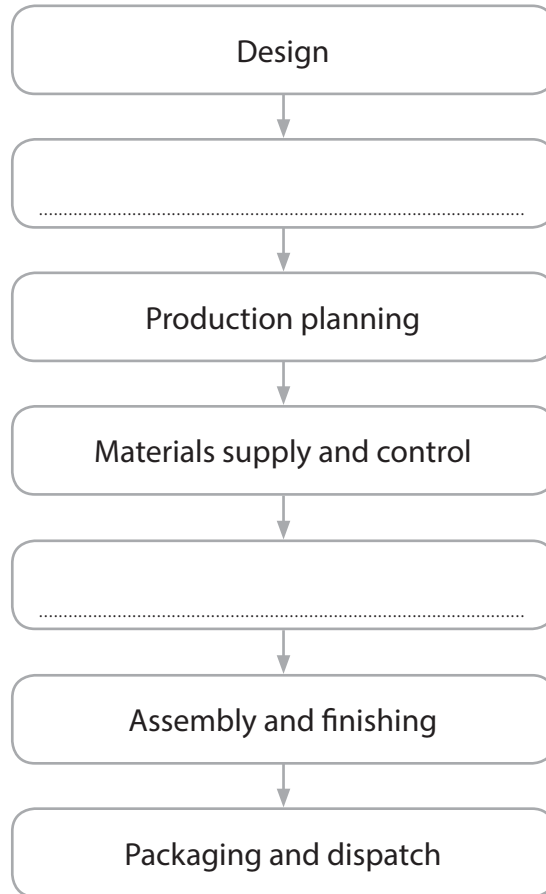
(Total for Question 8 = 9 marks)



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

(i) Complete the flow diagram by adding the **two** missing stages in the manufacture of satellite navigation system packaging.

(2)



(ii) State the stage in manufacturing where the thermoplastic material for the inner tray would be received and checked.

(1)

Stage

(b) List **three** activities carried out at the design stage when manufacturing satellite navigation system packaging.

(3)

- 1
- 2
- 3



(c) Describe the packaging and dispatch stage when manufacturing satellite navigation system packaging.

(3)

.....

.....

.....

.....

.....

(Total for Question 9 = 9 marks)



10 (a) State a specific material commonly used for the outer box of the satellite navigation system packaging. (1)

.....

(b) Flexography is used to print onto the surface of satellite navigation system packaging.

(i) State **three** production processes, other than flexography, used during the manufacture of satellite navigation system packaging. (3)

Process 1

.....

Process 2

.....

Process 3

.....

(ii) Explain why flexography is a suitable process to use during the manufacture of satellite navigation system packaging. (3)

.....

.....

.....

.....

.....

.....



(c) Explain why thermoplastic materials are appropriate for the inner tray of the satellite navigation system packaging.

(3)

.....

.....

.....

.....

.....

.....

.....

(Total for Question 10 = 10 marks)



BLANK PAGE



11 Control technology plays an important role in the manufacture of satellite navigation system packaging.

(a) (i) State **two** uses of control technology during the assembly and finishing stage. (2)

- 1
- 2

(ii) Describe **two** ways in which control technology is used when producing satellite navigation system packaging. (4)

- 1
-
-
-
- 2
-
-
-

(b) Describe **three** benefits to the manufacturer of using computer controlled production. (6)

- 1
-
-
-
- 2
-
-
-
- 3
-
-
-

(Total for Question 11 = 12 marks)



12 A manufacturer of satellite navigation system packaging has decided to change its production methods so that it follows lean manufacturing principles.

(a) (i) Explain the term **lean manufacturing**.

(2)

.....

.....

.....

(ii) Describe **two** advantages lean manufacturing could have for the distributor of satellite navigation system packaging.

(4)

1

.....

.....

2

.....

.....

(b) Changing to lean manufacturing methods will have an impact on the global environment and on the manufacturer's workforce.

(i) State **two** reasons why using lean manufacturing could have a positive effect on the global environment.

(2)

1

.....

.....

2

.....

.....



(ii) Explain **one** benefit that this change could have on the workforce.

(2)

.....

.....

.....

.....

(Total for Question 12 = 10 marks)



13 Satellite navigation system packaging is manufactured from a variety of materials.

Discuss how a manufacturer can process these materials sustainably.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for Question 13 = 4 marks)



BLANK PAGE

