

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 D: Engineering Fabrication

Friday 23 May 2014 – Afternoon

Time: 1 hour 30 minutes

Paper Reference

5EM03/3D

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 ►

P43394A

©2014 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 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 **engineering fabrication** sector.

(2)

Products	Put a cross in two boxes below
Reward sticker	<input type="checkbox"/>
Street furniture	<input type="checkbox"/>
Event leaflet	<input type="checkbox"/>
Spray starch	<input type="checkbox"/>
Drill set	<input type="checkbox"/>
Headache capsules	<input type="checkbox"/>

(b) Put a cross in the **two** boxes below where the products belong to the **engineering fabrication** sector.

(2)

Products	Put a cross in two boxes below
Medium density fibreboard	<input type="checkbox"/>
Frying pan	<input type="checkbox"/>
Fabric bracelet	<input type="checkbox"/>
Safety boots	<input type="checkbox"/>
Box file	<input type="checkbox"/>
Scaffolding pipes	<input type="checkbox"/>

(Total for Question 1 = 4 marks)



2 The tables below show some tools used during the manufacture of engineering fabrication products.

(a) Complete Table 1 by naming each tool.

(2)



Tool	Tool name	Use
		Used to tighten or loosen nuts on engineering products.
		Used with a centre punch to create hole centres for drilling.

Table 1

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

(4)



Tool	Tool name	Use
	Dividers	
	Chuck key	

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

Electronic mail

Titanium

Silver steel

Assembly robot

Composites

Social media

Continuous operation

Modern materials

Control technology

Information and
communications
technology (ICT)

(Total for Question 3 = 7 marks)



BLANK PAGE



4 Skateboards belong to the engineering fabrication sector and use control technology and material removal processes in their manufacture.

(a) Name **two other** products from this sector that use control technology and material removal processes in their manufacture.

(2)

Product 1

.....

Product 2

.....

(b) (i) State **one** type of control technology used in the manufacture of **Product 1**.

(1)

(ii) Explain **two** different reasons why this type of control technology is used.

(4)

1

.....

.....

.....

2

.....

.....

.....



(c) (i) Name a material removal process used in the manufacture of **Product 1**.

(1)

(ii) Briefly describe a material removal process used in the manufacture of **Product 1**.

(2)

(Total for Question 4 = 10 marks)



5 Information and communication technology (ICT) and computer-aided manufacture (CAM) are both used by manufacturers of engineering fabrication products.

(a) Describe **one** example of how a manufacturer would use websites to reduce its costs.

(2)

.....

.....

.....

.....

(b) As a result of high product demand, a manufacturer has changed from using traditional to computer-aided manufacturing (CAM) methods.

Describe **three** benefits of this change for the manufacturer.

(6)

1

.....

.....

2

.....

.....

3

.....

.....

(Total for Question 5 = 8 marks)



6 (a) Communications technologies are widely used by manufacturers of engineering fabrication products. Email is an example of an electronic communications technology.

(i) Name **two other** examples of an electronic communications technology. (2)

1

2

(ii) A customer needs products to be made urgently. Describe **two** examples of how a manufacturer could make use of email in this situation. (4)

1

.....

.....

.....

2

.....

.....

.....

(b) In the engineering fabrication sector, smart and modern materials are used in the manufacture of products.

(i) Name **one** smart material used in the engineering fabrication sector. (1)

.....

(ii) Explain why finishes are applied to modern materials. (2)

.....

.....

.....

.....

(Total for Question 6 = 9 marks)



7 Handling information and data is an essential feature in engineering fabrication companies.

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

(a) Product sales

(3)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(b) Production

(3)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for Question 7 = 6 marks)

TOTAL FOR SECTION A = 50 MARKS



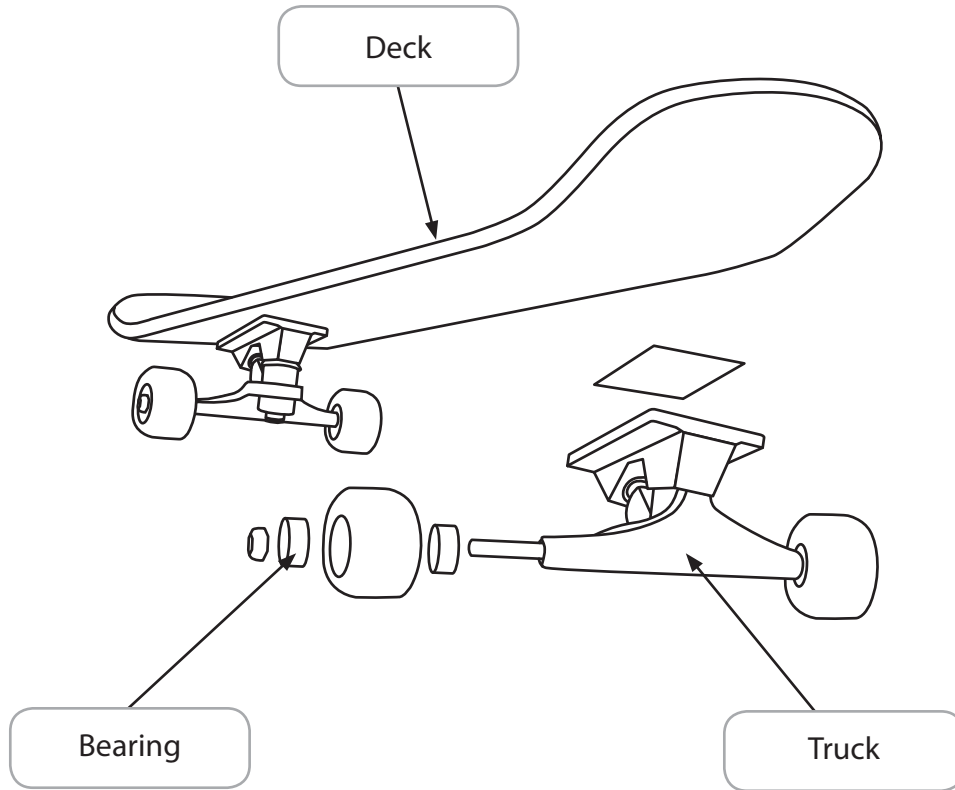
BLANK PAGE



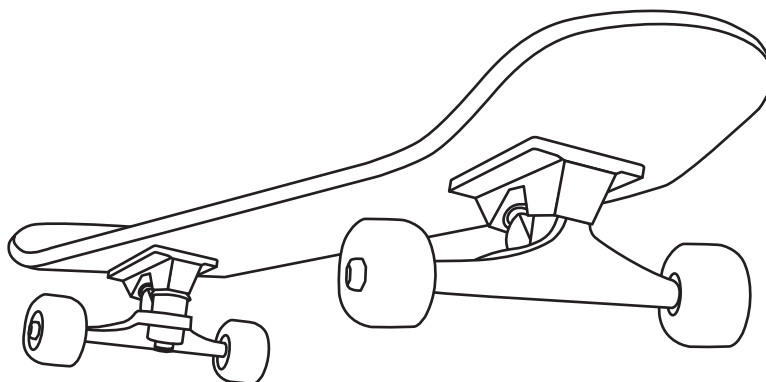
SECTION B

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

Below is an exploded image of a **skateboard**.



Below is an assembled image of a **skateboard**.



8 Describe, using notes and sketches:

(a) the function of the truck.

(3)

Truck

(b) the function of the deck.

(3)

Deck



(c) the function of the bearing.

(3)

Bearing

(Total for Question 8 = 9 marks)



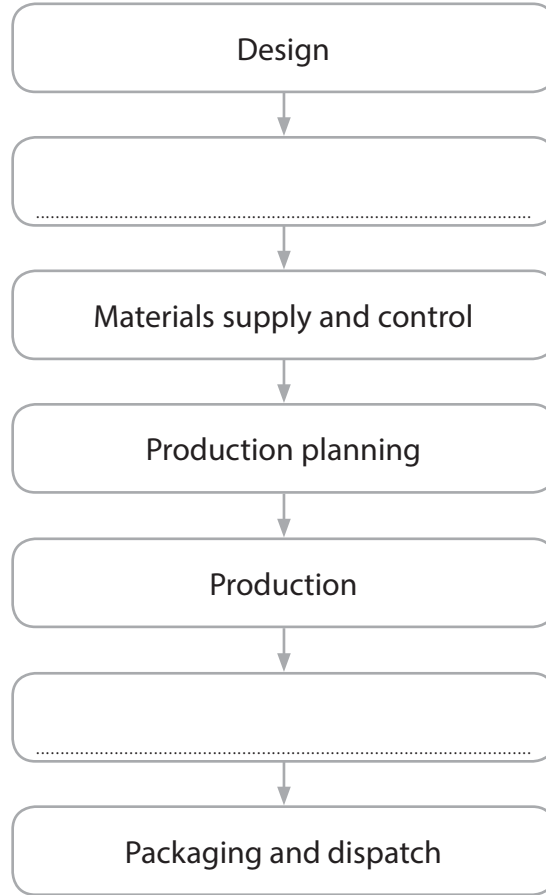
BLANK PAGE



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

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

(2)



(ii) State the stage in manufacturing where images and text are created for the deck.

(1)

Stage

(b) List **three** activities carried out at the materials supply and control stage when manufacturing skateboards.

(3)

- 1
- 2
- 3



(c) Describe the production planning stage when manufacturing skateboards.

(3)

.....

.....

.....

.....

.....

.....

.....

(Total for Question 9 = 9 marks)



10 (a) State a specific metal commonly used for the bearings of the skateboard. (1)

.....

(b) Sand casting is a process used to produce the trucks for the skateboard.

(i) State **three** production processes, other than sand casting, used during the manufacture of skateboards. (3)

Process 1

.....

Process 2

.....

Process 3

.....

(ii) Explain why sand casting is a suitable process for making the trucks. (3)

.....

.....

.....

.....

.....

.....

(c) Explain how the use of modern materials has reduced the environmental impact of manufacturing skateboards. (3)

.....

.....

.....

.....

.....

.....

(Total for Question 10 = 10 marks)



BLANK PAGE



11 Information and communication technology (ICT) plays an important role in the manufacture and sales of skateboards.

(a) (i) State **two** uses of ICT at the design stage.

(2)

- 1
- 2

(ii) Describe **two** uses of ICT in the packaging and dispatch stage.

(4)

- 1
-
-
-
- 2
-
-
-

(b) Explain **one** benefit of the use of ICT to the distributor of skateboards.

(2)

-
-
-
-



(c) Explain the impact ICT has on the design, development and production of skateboards.

(4)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for Question 11 = 12 marks)



12 A manufacturer of skateboards is considering increasing its use of automation. It is aware that an increase in its use of automation will have an impact on the workforce and working environment.

(a) Explain **two** different effects the increased use of automation will have on the workforce.

(4)

1

.....

.....

2

.....

.....

(b) Explain **two** benefits the increased use of automation will have on the working environment.

(4)

1

.....

.....

2

.....

.....

(c) State **two** other issues that the manufacturer should consider, other than the impact on the workforce and working environment.

(2)

1

.....

.....

2

.....

.....

(Total for Question 12 = 10 marks)



13 Most modern production processes generate heat.

Explain how waste heat can be used by a manufacturer of skateboards.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for Question 13 = 4 marks)



*14 Discuss the benefits of using 'just-in-time' techniques when manufacturing skateboards.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for Question 14 = 6 marks)

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

