

Write your name here	
Surname	Other names
Centre Number	Candidate Number
<b>Edexcel GCE</b>	
<b>Design and Technology</b> <b>Product Design: Resistant Materials Technology</b> <b>Advanced Subsidiary</b> <b>Unit 2: Design and Technology in Practice</b>	
Wednesday 18 May 2011 – Afternoon <b>Time: 1 hour 30 minutes</b>	Paper Reference <b>6RM02/01</b>
<b>You do not need any other materials.</b>	Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches it must be dark (HB or B). Coloured pens, pencils and highlighter pens must not be used.
- **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 70.
- 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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Answer ALL the questions. Write your answers in the spaces provided.

- 1 Figure 1 shows a wheelbarrow. The frame of the wheelbarrow is made from aluminium.

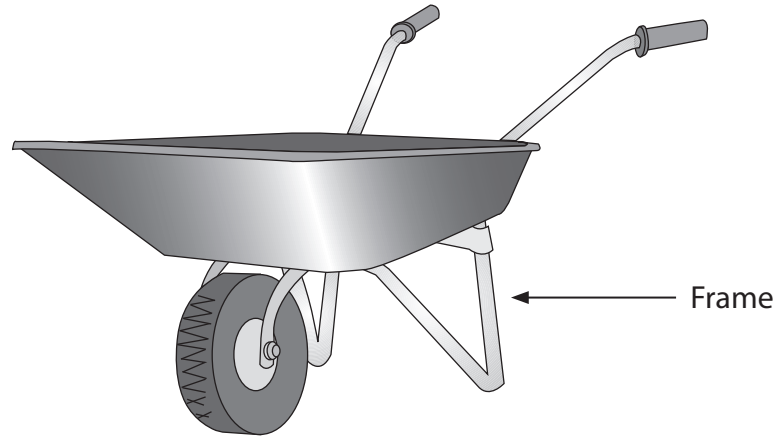


Figure 1

- (a) Explain **three** reasons why the frame of the wheelbarrow is made from aluminium.

(6)

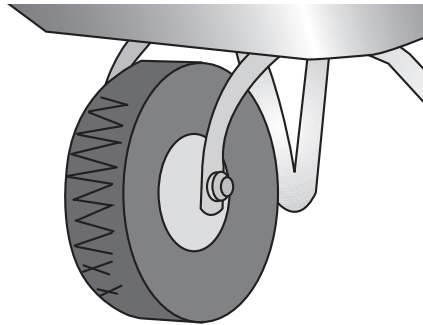
1 .....

2 .....

3 .....



(b) Figure 2 shows an enlarged view of the wheelbarrow wheel.



**Figure 2**

A bush is used as the bearing mechanism on which the wheel of the wheelbarrow rotates.

Give **two** reasons why a bush is used in preference to a ball-bearing for the wheelbarrow.

(2)

1 .....

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2 .....

.....

**(Total for Question 1 = 8 marks)**



2 Risk assessment is a necessary part of health and safety legislation.

(a) Explain **three** control measures that an employer can use to reduce the chances of an accident occurring in a workshop.

(6)

1 .....

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2 .....

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3 .....

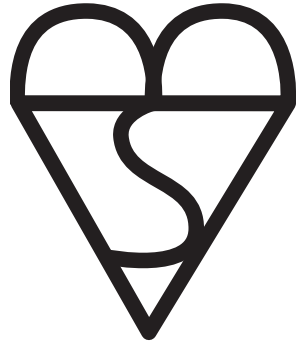
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(b) Figure 3 shows the 'Kitemark'.



**Figure 3**

Outline what the symbol signifies in terms of a product's quality.

(4)

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**(Total for Question 2 = 10 marks)**



3 Figure 4 shows a plastic clothes peg.



Figure 4

(a) Justify **three** reasons why mass production methods would be used to produce plastic clothes pegs.

(6)

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(b) Outline what is meant by total quality management (TQM).

(4)

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**(Total for Question 3 = 10 marks)**



4 Figure 5 shows four polypropylene (PP) wastepaper bins.



**Figure 5**

(a) Give **four** reasons why the wastepaper bins are manufactured from polypropylene (PP).  
(4)

1 .....

2 .....

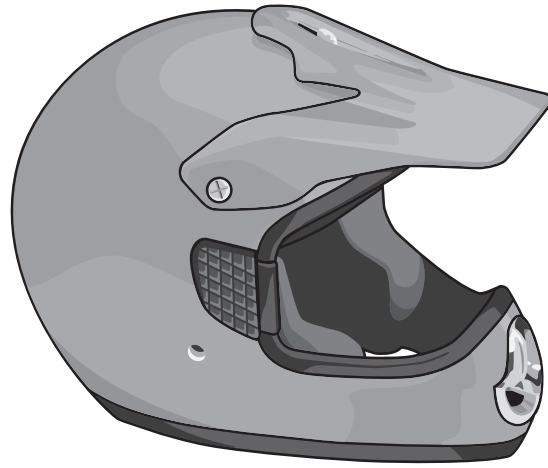
3 .....

4 .....





\*(b) Figure 6 shows a motorcycle crash helmet which is made from carbon fibre.



**Figure 6**

Evaluate the use of carbon fibre in the manufacture of crash helmets.

(6)

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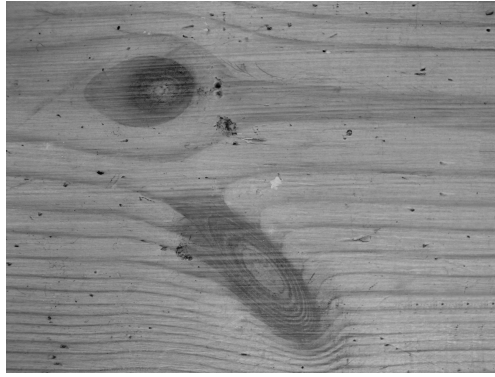
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**(Total for Question 4 = 10 marks)**



5 Figure 7 shows knots in a piece of timber.



**Figure 7**

(a) (i) State why knots occur in timber.

(1)

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(ii) Describe why knots are a problem when working timber.

(3)

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(b) Once a tree is felled, the timber is usually seasoned before it can be used.

Explain **three** advantages of using kiln seasoning in preference to natural seasoning.

(6)

1 .....

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2 .....

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3 .....

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**(Total for Question 5 = 10 marks)**



6 Figure 8 shows three different types of cam follower.

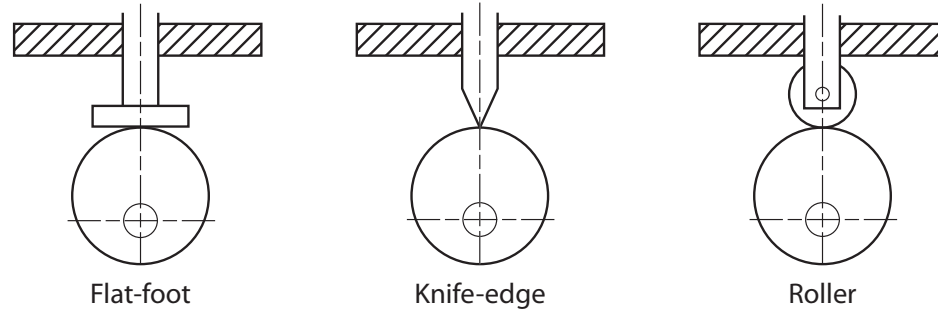


Figure 8

(a) Give **two** operational characteristics for each of the cam followers.

(6)

Flat-foot

1 .....

2 .....

Knife-edge

1 .....

2 .....

Roller

1 .....

2 .....



(b) Reactive glass is used in a range of products.

Describe how reactive glass is able to change its state from clear to tinted and back again.

(2)

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(c) Give **two** advantages of using solar panels to heat domestic hot water.

(2)

1 .....

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2 .....

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**(Total for Question 6 = 10 marks)**



7 Computer aided design (CAD) can be used to create 3D 'virtual' models.

(a) Outline **four** advantages of using a 'virtual' model as part of the design development process.

(4)

1 .....

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2 .....

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3 .....

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4 .....

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\*(b) Figure 9 shows a number of turned aluminium chess pieces which have been manufactured using a computer numerically controlled (CNC) lathe.



Figure 9

Evaluate the use of computer aided manufacture (CAM) in the production of these chess pieces.

(8)

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Handwriting practice area with 18 horizontal dotted lines.

**(Total for Question 7 = 12 marks)**

**TOTAL FOR PAPER = 70 MARKS**



P 3 5 1 5 4 A 0 1 5 1 6





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