Candidate forename		Candidate surname	

Centre number						Candidate number				

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION

A562

DESIGN AND TECHNOLOGY

Resistant Materials
Sustainable Design

MONDAY 10 JANUARY 2011: Afternoon
DURATION: 1 hour

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the question paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

None

READ INSTRUCTIONS OVERLEAF

DC (NF/SW) 11MEP01239 41096/1

INSTRUCTIONS TO CANDIDATES

- **Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully. Make sure you know what you have to do before starting your answer.**
- **Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).**
- **Answer ALL the questions in Section A AND Section B.**

INFORMATION FOR CANDIDATES

- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **The total number of marks for this paper is 60.**
- **Your quality of written communication is assessed in questions marked with an asterisk (*).**

SECTION A

Answer ALL questions.

You are advised to spend 15 minutes on this section.

On questions 1–5 (circle) your answer.

1 Which of the following is a renewable energy resource?

(a) Gas

(b) Oil

(c) Solar

(d) Coal **[1]**

2 The final stage of a life cycle assessment of a product is

(a) Disposal of the product

(b) Transporting the product

(c) Rethinking the product

(d) Using the product **[1]**

3 Anthropometrics is the name given to the measurement of

(a) A product

(b) Production

(c) Sales

(d) People **[1]**

4 An example of a sustainable resistant material is

(a) Pine

(b) Acrylic

(c) Aluminium

(d) Gold **[1]**

5 An example of a material that will deteriorate if left outside without a suitable surface treatment is

(a) Polyvinylchloride (PVC)

(b) Mild steel

(c) Nylon

(d) Stainless steel **[1]**

6 State the meaning of the symbol shown

_____ **[1]**

7 State the meaning of the term 'reforestation'.

_____ **[1]**

8 What do the letters COSHH stand for?

_____ **[1]**

9 State the meaning of the term 'eco footprint'.

_____ **[1]**

10 Name the group of materials whose properties can change due to changes in pressure, force, light or temperature.

_____ **[1]**

Decide whether each of the following is TRUE or FALSE.

Tick (✔) the box to show your answer.

	TRUE	FALSE
11 Grinding up thermoplastic products and remoulding them into new products is an example of primary recycling	☐	☐
		[1]
12 Biodegradeable means that a product will rot naturally in the environment	☐	☐
		[1]
13 The recycling of aluminium drinks cans uses more energy than making new aluminium	☐	☐
		[1]
14 Cultural issues are when designers consider ways in which people behave and relate to each other	☐	☐
		[1]
15 Ergonomics is how products interact with people	☐	☐
		[1]

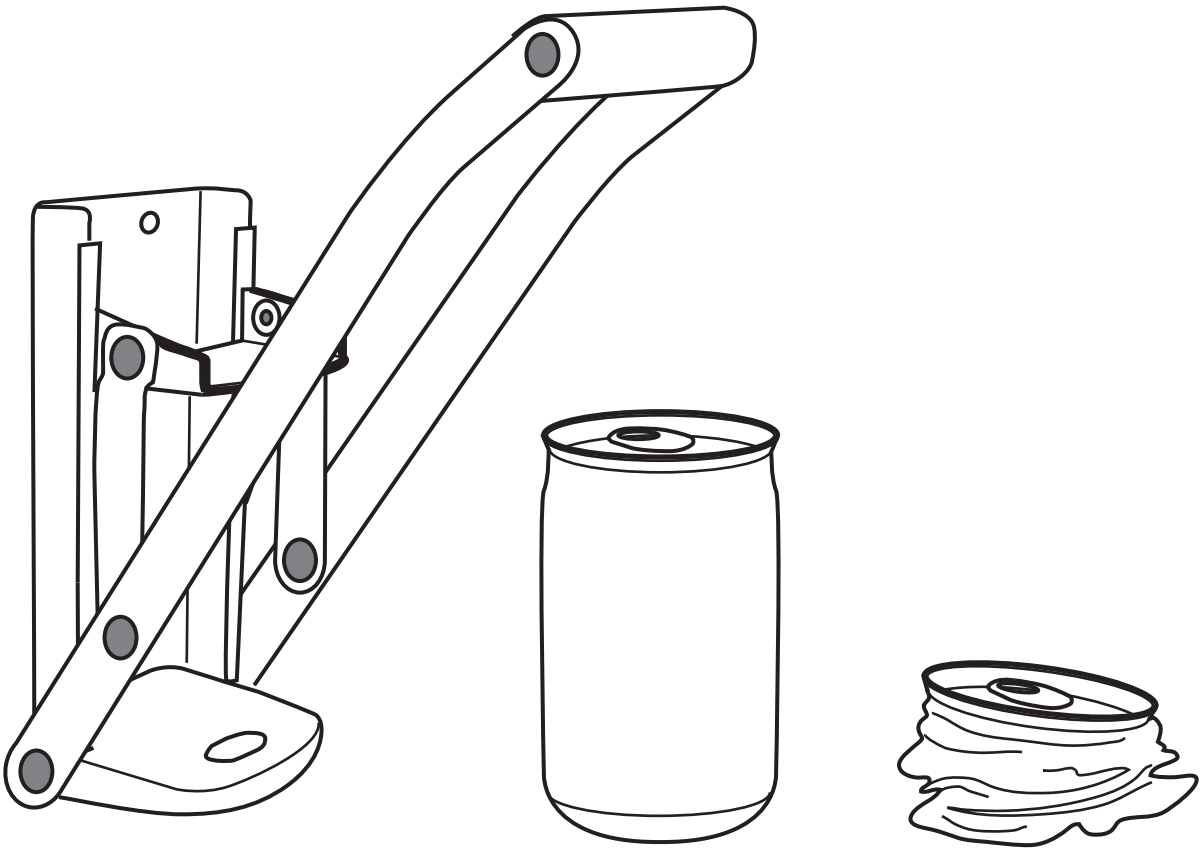
Total [15]

SECTION B

Answer ALL questions.

You are advised to spend 45 minutes on this section.

16 Fig. 1 shows a can crusher.



can before and after crushing

Fig. 1

(a) Explain what is meant by the term 'product analysis'.

_____

_____

_____

_____

_____

_____

_____ **[3]**

(b) Disassembly is a good way of learning about a product.

List FOUR pieces of information that could be found from disassembly of the can crusher.

1 _____

2 _____

3 _____

4 _____

[4]

(c) Give THREE reasons why the can crusher can be considered an environmentally friendly product.

1 _____

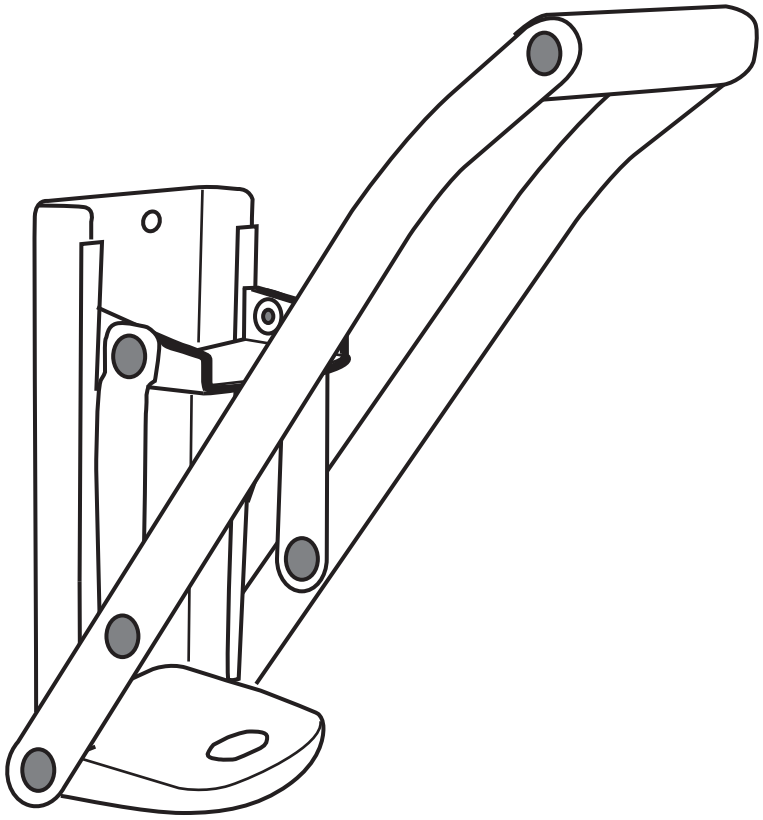
2 _____

3 _____

[3]

(d) When the can crusher is being used it often falls over.

Produce an annotated sketch to show how the design could be developed to improve the can crusher when in use.



[3]

(e) Give two factors which the designer would need to consider to enable the can crusher to be sold as an environmentally friendly product.

_____

_____

_____

_____

_____

_____ **[2]**

Total [15]

17 Fig. 2 shows a garden table made from recycled plastic.

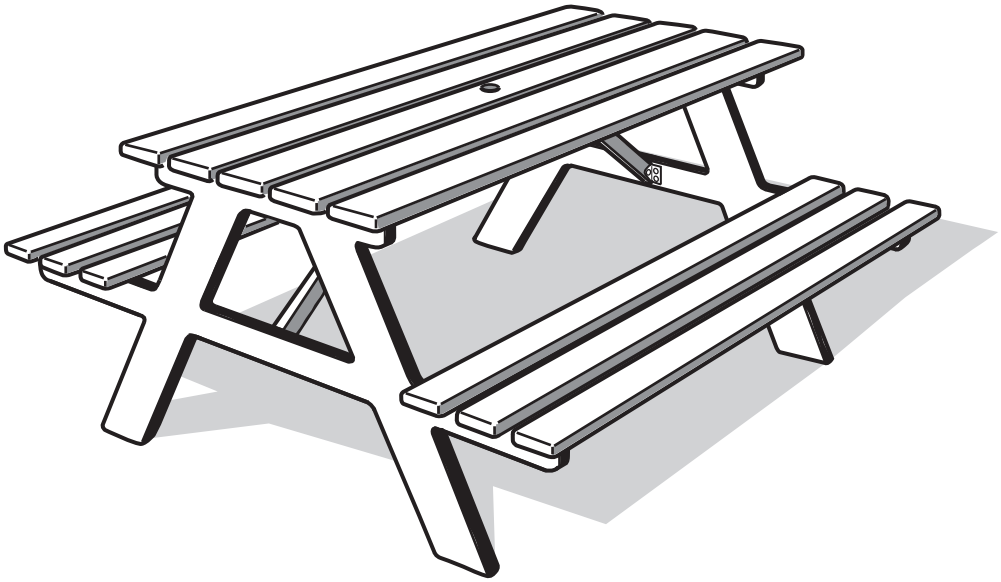


Fig. 2

(a) Name TWO user groups who may NOT find this table easy to use and give a reason why this design may not be suitable.

User group 1 _____

Reason _____

_____

_____ **[3]**

User group 2 _____

Reason _____

_____

_____ **[3]**

(b) The table is fastened together using bolts, nuts and washers.

Name a specific material for these components which will not deteriorate when used outside.

_____ **[1]**

(c) Fig. 3 shows a symbol moulded into each part of the table.

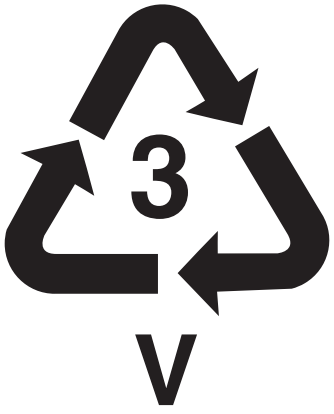


Fig. 3

Give TWO reasons why the information given by this symbol would be beneficial when disposing of the product at the end of its useful life.

1 _____

2 _____

[2]

(d*) Discuss why the user may prefer a table made from recycled plastic rather than the same design made from solid wood.

_____

_____

_____

_____

_____

_____ **[6]**

Total [15]

18 (a) Explain TWO environmental issues associated with the manufacture of products.

Issue 1 _____

_____

_____

_____ **[2]**

Issue 2 _____

_____

_____

_____ **[2]**

(b) Give TWO reasons why many designers now refuse to design products which contain chlorofluorocarbons (CFCs).

1 _____

_____ **[1]**

2 _____

_____ **[1]**

(c) Describe TWO ways in which the energy needed to transport products from where they are manufactured to the consumer can be reduced.

1 _____

_____

_____

_____

2 _____

_____

_____

_____

[4]

(d) Explain the meaning of 'Carbon offsetting'.

_____

_____

_____

_____

_____ **[3]**

(e) Describe ONE practical way in which companies carry out 'Carbon offsetting'.

_____

_____

_____

_____ **[2]**

Total [15]

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