



GENERAL CERTIFICATE OF SECONDARY EDUCATION
DESIGN AND TECHNOLOGY
ELECTRONICS AND CONTROL SYSTEMS
 Sustainable Design

A512

Tuesday 22 June 2010
Morning

Duration: 1 hour

Candidates answer on the Question Paper

OCR Supplied Materials:
None

Other Materials Required:
None



| | | | |
|--------------------|--|-------------------|--|
| Candidate Forename | | Candidate Surname | |
|--------------------|--|-------------------|--|

| | | | | | | | | | | |
|---------------|--|--|--|--|--|------------------|--|--|--|--|
| Centre Number | | | | | | Candidate Number | | | | |
|---------------|--|--|--|--|--|------------------|--|--|--|--|

MODIFIED LANGUAGE

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- 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).

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 (*).
- This document consists of **12** pages. Any blank pages are indicated.

Section A

Answer **all** questions.

You are advised to spend 15 minutes on this section.

On questions 1–5 **circle** your answer.

1 The symbol below stands for:



- A Children's equipment
- B Conformity to European standards
- C Charity establishment
- D British standards

[1]

2 Smart materials:

- A Respond to environmental changes.
- B Are used to keep windows clean.
- C Make plants grow.
- D Allow you to make small measurements.

[1]

3 With reference to the 6R statements, which of the following is **reuse**:

- A Taking product back to the shop.
- B A product from natural materials.
- C A manufactured product.
- D Putting materials or components to another purpose.

[1]

4 A chemical store of electrical energy is:

- A Solar heated water.
- B Brine from sea water.
- C Zinc chloride paste.
- D Fermented cow manure.

[1]

5 Sustainable timber used in structures is:

- A Cut down every year.
- B Taken from managed forests.
- C Taken from cut and clear forests.
- D Recycled to compost.

[1]

6 What does the abbreviation RoHS stand for?

..... [1]

7 Fig. 1 shows a reel of solder.

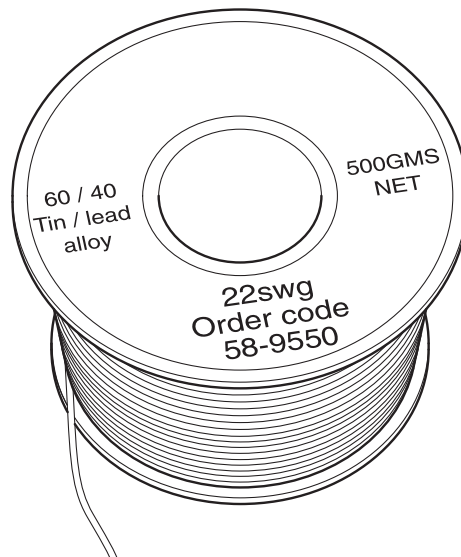


Fig. 1

What could be unsafe about the product shown?

..... [1]

8 The battery in Fig. 2 has no power left in it.

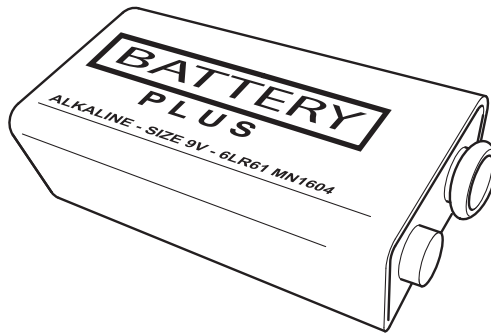


Fig. 2

How should the battery be disposed of?

..... [1]

9 Name **one** environmentally friendly packaging material.

..... [1]

10 Name **one** organisation which helps producers to get a realistic price for their product.

..... [1]

Decide whether each of the following statements is **true** or **false**.
Tick (✓) the box to show your answer.

| | True | False | |
|---|--------------------------|--------------------------|-----|
| 11 Putting waste into a landfill site is a method of recycling. | <input type="checkbox"/> | <input type="checkbox"/> | [1] |
| 12 Energy is saved by using a computer screensaver. | <input type="checkbox"/> | <input type="checkbox"/> | [1] |
| 13 A bicycle dynamo uses a source of renewable energy for the lights. | <input type="checkbox"/> | <input type="checkbox"/> | [1] |
| 14 Designers of new products should plan for recycling. | <input type="checkbox"/> | <input type="checkbox"/> | [1] |
| 15 WEEE regulations cover the safe disposal of electronic products. | <input type="checkbox"/> | <input type="checkbox"/> | [1] |

Section A Total [15]

Section B

Answer **all** questions.

You are advised to spend 45 minutes on this section.

16 Consumers are encouraged to reduce the energy they use in the home.

(a) (i) Give **two** benefits of reducing energy use in the home.

1
..... [1]

2
..... [1]

(ii) Give **two** everyday energy saving tips that a family can use in the home.

1
..... [1]

2
..... [1]

(b) (i) List **five** possible improvements for the **owner** of a house that has no energy saving features.

1
2
3
4
5 [5]

(ii) From your answer in (b)(i) choose the most important improvement to save energy.

Give a reason for your choice.

Most important improvement

.....

Reason for choice

.....

.....

..... [2]

(c) A new house could be built using sustainable materials.

Describe the use of **two** sustainable building materials.

Material 1
.....
.....
..... [2]

Material 2
.....
.....
..... [2]

Total [15]

17 Fig. 3 shows a wind up radio. It is used in remote parts of the world where electrical power and batteries are not always available.

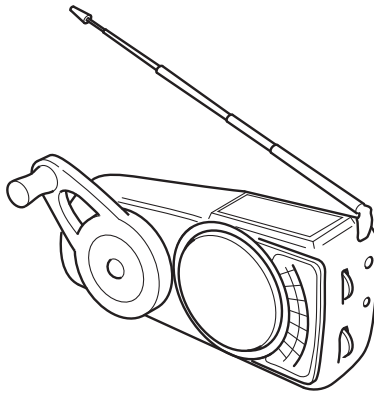


Fig. 3

(a) (i) Give **three** benefits of having a wind up radio.

- 1
- 2
- 3 [3]

(ii) Give **one** other application of wind-up technology.

.....
..... [1]

(iii) Describe how wind up products produce and store energy.

.....
.....
.....
..... [2]

(b) Energy from sustainable sources can contribute to the local economy in many parts of the world.

Give **three** sustainable energy sources.

- 1
- 2
- 3 [3]

(c) New electrical products for the home should follow Eco-design principles.

Give **three** Eco-design points the designer must consider.

- 1
- 2
- 3 [3]

(d) Describe the impact on the culture of remote areas of the world if television becomes easily available.

-
-
-
- [3]

Total [15]

18 Fig. 4 shows two controllers.

Electronic control products can contribute to safety and security in the home.

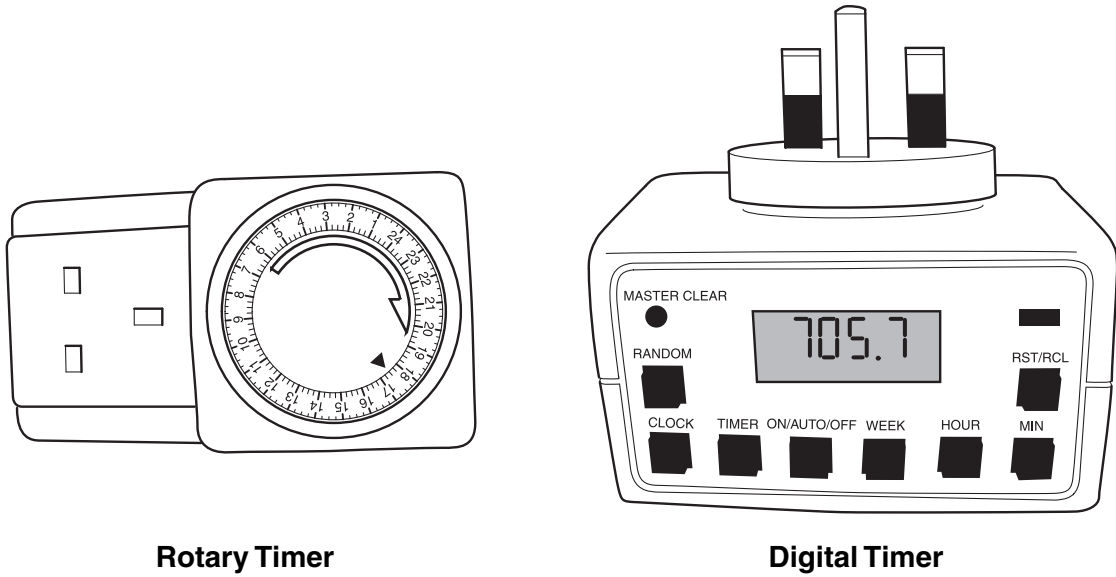


Fig. 4

(a) (i) State **two** ways that these controllers can contribute to safety and security in the home.

1 [1]

2 [1]

(ii) State **three** safety issues when using the controllers shown in Fig. 4.

1 [1]

2 [1]

3 [1]

Industry must change to reduce the carbon footprint of products.

(c) Give details of **two** changes industry should make to reduce the carbon footprint of products.

1

.....

.....

2

.....

..... [4]

Total [15]

Section B Total [45]

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