

**Thursday 21 June 2012 – Afternoon**

**GCSE DESIGN AND TECHNOLOGY**  
**Electronics and Control Systems**

**A512/01** Sustainable Design

Candidates answer on the Question Paper.

**OCR supplied materials:**

None

**Other materials required:**

None

**Duration:** 1 hour



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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**INSTRUCTIONS TO CANDIDATES**

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions in Section A **and** Section B.
- 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).
- Do **not** write in the bar codes.

**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 will be 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** Fitting double glazing to a house:

- (a) Lets in twice as much light
- (b) Reduces heat loss to the surroundings
- (c) Re-uses glass from an older house
- (d) Helps keep the loft well ventilated

[1]

**2** Fig. 1 shows a symbol often seen in public places. What does it represent?



**Fig. 1**

- (a) Danger – windy area
- (b) Keep Britain Tidy
- (c) Burn your rubbish here
- (d) Fairtrade

[1]

**3** Product life cycle analysis is about:

- (a) Greater use of bicycles
- (b) Taking your bicycle on the train
- (c) Considering the impact of a product on the environment
- (d) Giving away working products for re-use

[1]

- 4 Burning natural gas to provide heating:
- (a) Improves the efficiency of wind turbines
  - (b) Contributes directly to global warming
  - (c) Reduces wave power around the coast
  - (d) Is using a sustainable resource [1]

- 5 Wind-up electronic products:
- (a) Help save the planet's resources
  - (b) Emit carbon dioxide during use
  - (c) Cost a lot to operate
  - (d) Cause problems when recycled [1]

- 6 Complete the following to give the full meaning of the abbreviation COSHH.  
C ..... of S ..... H ..... to H ..... [1]

- 7 State the meaning of the term non-biodegradable.  
..... [1]

- 8 Give the name of **one** toxic material used in the electronics industry.  
..... [1]

- 9 State the term that describes the look of a product.  
..... [1]

- 10 Name the 6R that refers to the mending of broken electronic equipment.  
..... [1]

4

Decide whether each of the following statements is **true** or **false**.

Tick (✓) the box to show your answer.

	<b>True</b>	<b>False</b>	
<b>11</b> Eco-design relates to making lightweight objects in a factory	<input type="checkbox"/>	<input type="checkbox"/>	<b>[1]</b>
<b>12</b> Hydro-electric power generation contributes to global warming	<input type="checkbox"/>	<input type="checkbox"/>	<b>[1]</b>
<b>13</b> Anthropometrics refers to the measurement of humans	<input type="checkbox"/>	<input type="checkbox"/>	<b>[1]</b>
<b>14</b> Solar electric panels can help decrease household carbon emissions	<input type="checkbox"/>	<input type="checkbox"/>	<b>[1]</b>
<b>15</b> LED light bulbs need regular replacement	<input type="checkbox"/>	<input type="checkbox"/>	<b>[1]</b>
			<b>Total [15]</b>

**Section B**

Answer **all** questions.

You are advised to spend 45 minutes on this section.

**16** Fig. 2 shows a PDA (Portable Digital Assistant).



**Fig. 2**

**(a) (i)** Describe **one** change required if the PDA is to be of use to other cultures.

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

**(ii)** The PDA is assembled in China where the conditions of working can be different to the UK.  
Explain what is meant by conditions of working.

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

(b) (i) The assembly method used in the PDA allows for easy dismantling into its component parts.  
State why this is considered good design practice.

..... [1]

(ii) Describe **two** ways in which the use of an electronic touch screen can improve a product.

1 .....

.....

.....

2 .....

.....

..... [4]

(c) The paper instruction manual for the PDA has been replaced by web-based support.

Explain **two** benefits of this to the environment.

1 .....

.....

.....

2 .....

.....

..... [4]

(d) Explain what is meant by the carbon footprint of a product.

.....

.....

.....

..... [2]

**Total [15]**

17 Fig. 3 shows a compact fluorescent lamp.



Fig. 3

(a) (i) State why using these lamps is considered good environmental practice.

..... [1]

When the lamp wears out, some of the electronic components can be removed and re-used.

(ii) State how the glass remains of the compact fluorescent lamp should be disposed of.

..... [1]

(iii) Give the name of the harmful metal used in fluorescent tubes.

..... [1]

(iv) Describe how compact fluorescent lamps can contribute to the sustainability of a large building.

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

(b) Worn out, broken or faulty electronic products are often sent to developing countries for processing.

Explain **three** reasons for using this practice.

1 .....

.....

.....

2 .....

.....

.....

3 .....

.....

..... [6]

(c) Manufacturers of electronic products use large amounts of energy.

Describe **two** examples of practical carbon offsetting.

1 .....

.....

.....

2 .....

.....

..... [4]

**Total [15]**



18 Fig. 4 shows a printer cartridge in its protective packaging.



Fig. 4

(a) (i) State **two** environmental benefits of this type of protective packaging.

1 .....

2 ..... [2]

(ii) Name **one** non-renewable resource used to make plastic.

..... [1]

(b) Fig. 5 shows an example of sustainable packaging.

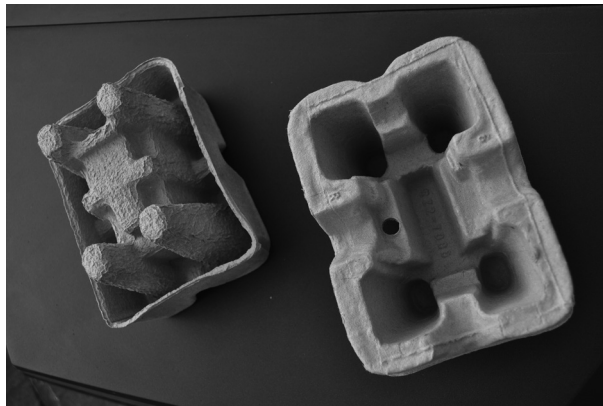


Fig. 5

(i) Name **one** material suitable for the manufacture of sustainable packaging.

..... [1]

(ii) Explain how your answer to (i) is sustainable.

.....

..... [2]

10

(c) The manufacturer wishes to promote the printer cartridge as an environmentally friendly product.

In the space below, show **three** pieces of information which could be found on the product packaging.

[3]



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