

GENERAL CERTIFICATE OF SECONDARY EDUCATION
DESIGN AND TECHNOLOGY
Industrial Technology
Sustainable Design

A542

Thursday 16 June 2011
Morning

Duration: 1 hour

Candidates answer on the question paper.

OCR supplied materials:

None

Other materials required:

None



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. 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**.
- 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 is assessed in questions marked with an asterisk (*).
- This document consists of **16** pages. Any blank pages are indicated.

Section A

Answer **all** questions.

You are advised to spend 15 minutes on this section.

For questions 1-5 **circle** your answer.

- 1** What type of energy resource is ground source heating?
- (a) Non-renewable
 - (b) Renewable
 - (c) Non-rechargeable
 - (d) Rechargeable [1]
- 2** The measurement of size, shape and movement of the human body is:
- (a) Ergonomics
 - (b) Eugenics
 - (c) Anthropometrics
 - (d) Aromatherapy [1]
- 3** An industry can become more sustainable by:
- (a) Planning the supply and demand of materials
 - (b) Keeping a stock of components ready for use
 - (c) Using specialist machinery and workers
 - (d) Having an assembly line [1]
- 4** Vehicles that use a combination of electricity and fossil fuel are called:
- (a) Kinetic energy recovery vehicles
 - (b) Hybrid vehicles
 - (c) Regenerative braking vehicles
 - (d) Fuel cell vehicles [1]

- 5 A sustainable product is designed and made to reduce its impact on:
- (a) Industrial production processes
 - (b) Waste to energy power stations
 - (c) Materials, energy and environment
 - (d) Low pay and employer injustice [1]

6 State **one** of the 6Rs that can be described as extending product life.
..... [1]

7 Name a raw material used to make plastics.
..... [1]

8 Is aluminium a recyclable or non-recyclable material?
..... [1]

9 Workers in a factory are protected from what types of material by COSHH regulations?
..... [1]

10 Name a gas that is responsible for global warming.
..... [1]

Decide whether the statement is **true** or **false**.

Tick (✓) the box to show your answer.

	True	False	
11 ETI is a workers' Union that fights for better pay and conditions	<input type="checkbox"/>	<input type="checkbox"/>	[1]
12 FSC wood is not sustainable	<input type="checkbox"/>	<input type="checkbox"/>	[1]
13 Energy used in manufacturing is part of a product's carbon footprint	<input type="checkbox"/>	<input type="checkbox"/>	[1]
14 Products at the end of their life span should be put in landfill sites	<input type="checkbox"/>	<input type="checkbox"/>	[1]
15 Rechargeable NiCad batteries are toxic	<input type="checkbox"/>	<input type="checkbox"/>	[1]
			Total [15]

Section B

Answer **all** questions.

You are advised to spend 45 minutes on this section.

16 Fig. 1 shows two portable music players designed in different decades.

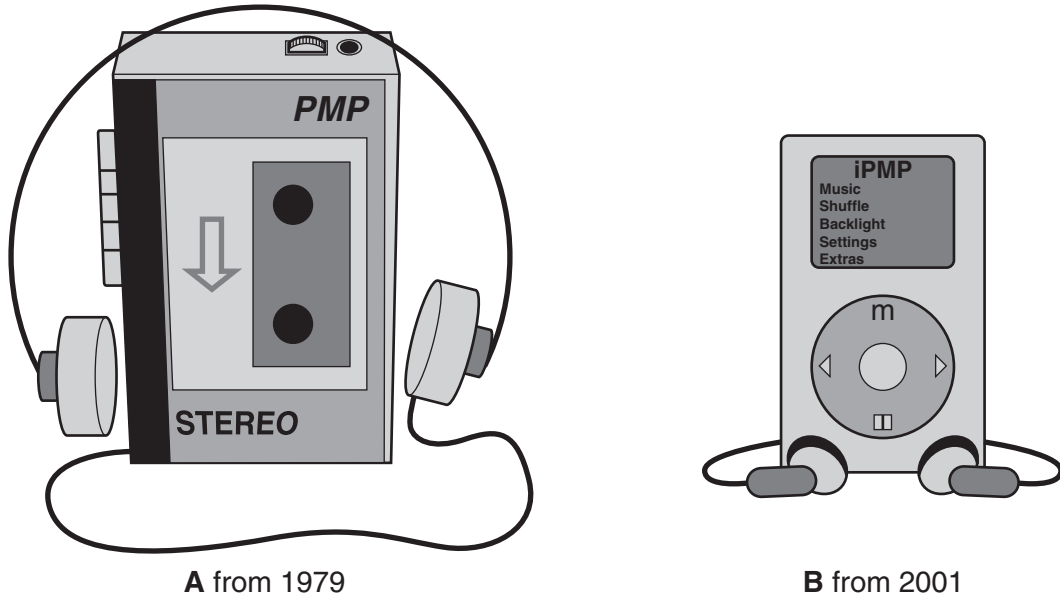


Fig. 1

(a) State **three** ways player **B** has advanced over player **A**.

- 1
 - 2
 - 3
- [3]

(b) Give **two** ways in which the portable music players could be disposed of with minimum impact on the environment at the end of their life.

- 1
 - 2
- [2]

(c) Give **two** benefits of repairing a product.

Benefit 1

.....

Benefit 2

..... [2]

(d) Name a portable device that could be used for recharging batteries when there is no access to mains chargers.

.....

..... [1]

(e) Some manufacturing industries use sustainable sources of electrical energy.

(i) State **two** sources of sustainable electrical energy.

1

.....

2

..... [2]

(ii) Give **three** advantages of using electricity from sustainable sources.

Advantage 1

.....

.....

Advantage 2

.....

.....

Advantage 3

.....

..... [3]

(iii) Give **two** disadvantages of using electricity from sustainable sources.

Disadvantage 1

.....

.....

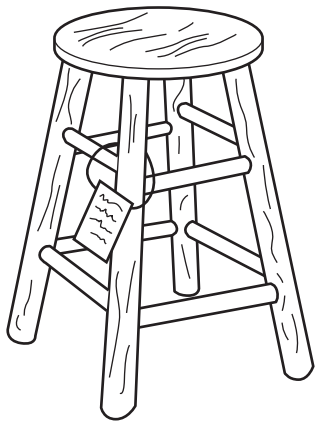
Disadvantage 2

.....

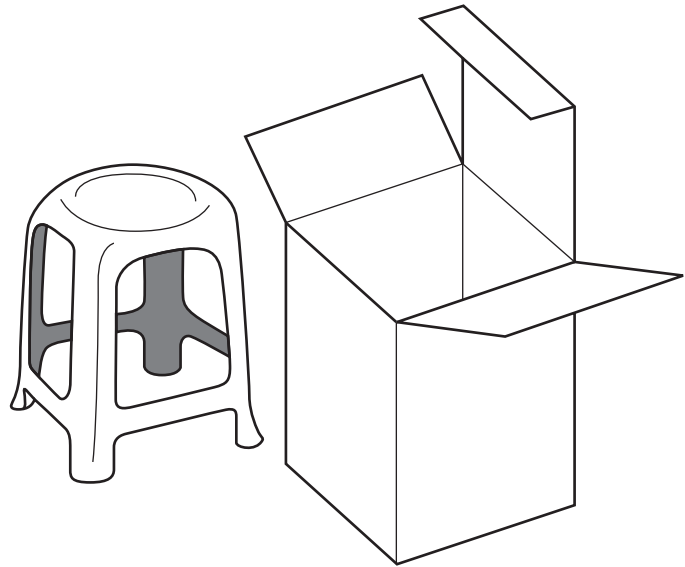
..... [2]

Total [15]

17 Fig. 2 shows two stools for sale in a furniture shop.



wooden stool **A** with point of sale swing tag



plastic stool **B** and cardboard packaging

Fig. 2

(a) (i) State how the following 6Rs could be applied to stool **A**.

RETHINK	
REDUCE	
REUSE	

[3]

(ii) State how the following 6Rs could be applied to stool **B**.

RECYCLE	
REPAIR	
REFUSE	

[3]

(c) (i) State **one** example of the use of chlorofluorocarbons (CFCs).

..... [1]

(ii) Explain the effect of CFCs on the environment.

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

Total [15]

18 Fig. 3 shows a kitchen cabinet.

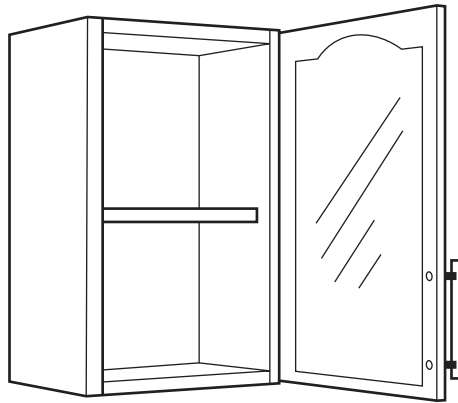




Fig. 3

(a) Complete the table below to show the symbols, materials and parts used in the kitchen cabinet shown in Fig. 3.

The first one has been done for you.

Symbol	Material	Part
	Polypropylene	Shelf support
		
FSC		
	Steel	Handle

[5]

(b) Fig. 4 shows a symbol found on the packaging for the kitchen cabinet.



Fig. 4

(i) State what this symbol means.

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

(ii) Give **two** ways in which cardboard packaging can be collected for recycling.

1

.....

2

..... [2]

(iii) Explain the term 'tertiary recycling'.

.....

.....

.....

..... [2]

(c) Many companies are now described as global.

State what is meant by the term 'global'.

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

(d) Many products are made and packaged in China and sold in the UK.

(i) Give **two** advantages of **making and packaging** products in China.

Advantage 1
.....
.....
Advantage 2
.....
..... [2]

(ii) Give **two** disadvantages of **selling** products made in China in the UK.

Disadvantage 1
.....
.....
Disadvantage 2
.....
..... [2]

Total [15]

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