OCR
Oxford Cambridge and RSA

Thursday 16 June 2016 – Morning

GCSE DESIGN AND TECHNOLOGY Resistant Materials

A565/01 Sustainability and Technical Aspects of Designing and Making

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
None

Duration: 1 hour 30 minutes

Candidate forename		Candidate surname	

Centre number						Candidate number				

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** 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. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- 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 **80**.
- Your quality of written communication is assessed in questions marked with an asterisk **(*)**.
- This document consists of **20** pages. Any blank pages are indicated.
- Dimensions are in millimetres unless stated otherwise.

SECTION A

Answer **all** the questions.

You are advised to spend 40 minutes on this section.

On Questions 1–5 circle your answer.

1 Taking a product apart before recycling is called:

(a) Disassociation

(b) Disassembly

(c) Disruption

(d) Distortion **[1]**

2 The process of creating a new artefact starts with:

(a) Product design

(b) Product placement

(c) Product development

(d) Product evaluation **[1]**

3 Safety goggles are worn in the workshop to protect the wearer's eyes from:

(a) Long hair and loose clothing

(b) The bright lights in the workshop

(c) Flying splinters, sparks and dust

(d) Direct sunlight **[1]**

4 The concept of Fair Trade is:

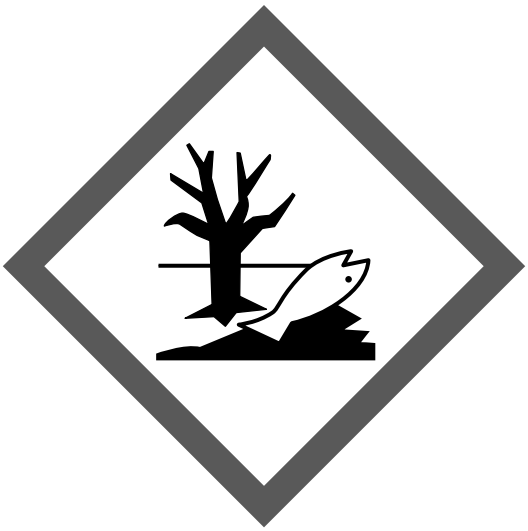
(a) Producers only receive enough for their goods to cover their costs

(b) Producers are forced to sell their goods at a loss

(c) Producers are not allowed to sell their goods abroad

(d) Producers receive a reasonable price for their goods **[1]**

5 The symbol shown below can be found on cans of paint containing highly volatile organic compounds (HVOCs).



The meaning of this symbol is:

(a) Water pollution

(b) Do not apply in winter

(c) Dangerous for the environment

(d) No fishing **[1]**

6 The letters C F C stand for

Chlorinated **F**luoro **C** ..... **[1]**

7 Which of the 6Rs refers to adapting a product to suit an alternative use?

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

8 The measurement of the total CO_2 given off during the manufacture of a product is called the Carbon ..... **[1]**

9 Products and materials that cannot be recycled may have to be disposed of in

L ..... sites. **[1]**

10 A risk assessment will identify ..... in the workplace. **[1]**

Decide whether the statements below are **True** or **False**.

Tick (✓) the box to show your answer.

		True	False	
11	Cultural groups should not be consulted when designing products.	☐	☐	**[1]**
12	Market research only focuses upon gender issues.	☐	☐	**[1]**
13	Using the cheapest materials will always extend a product's life.	☐	☐	**[1]**
14	Disposal is the final step in a product's life cycle.	☐	☐	**[1]**
15	User safety is an important factor when designing a product.	☐	☐	**[1]**

16 Fig. 1 shows an educational toy for young children.

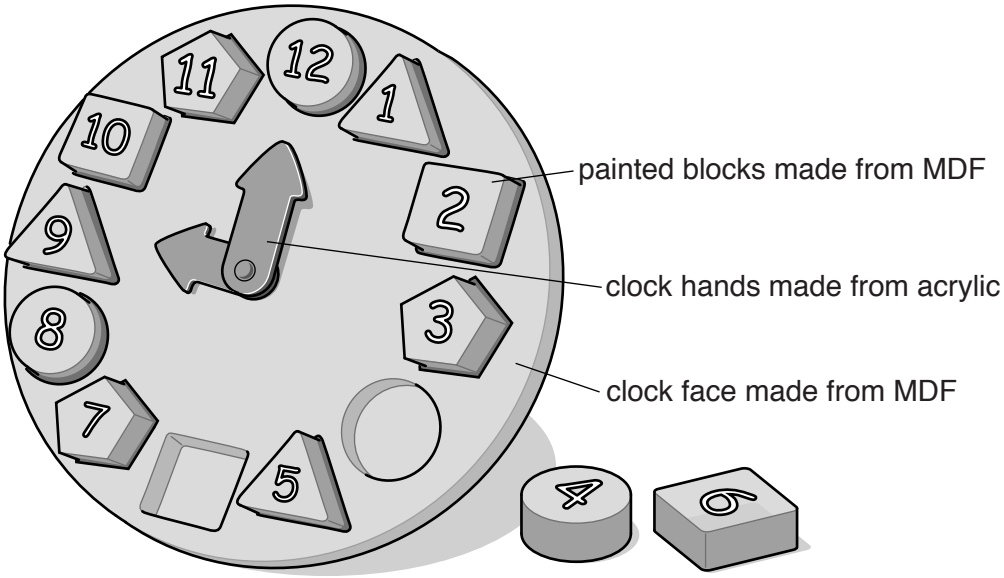


Fig. 1

(a) Name **one** relevant piece of user research that would be carried out before designing this toy.

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

(b) State **one** safety precaution to be taken when working with MDF.

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

(c) Explain why this toy is not environmentally friendly when it has reached the end of its useful life.

.....

.....

.....

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

(d) When in use, the number blocks easily fall out of the clock face.

Use sketches and notes to show modifications for the toy that will:

- stop the number blocks from falling out easily
- allow the number blocks to be easily removed and replaced.

[4]

(e) Give **three** modifications that would make the educational toy more suitable for users who have restricted manual skills.

1 .....

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2 .....

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3 .....

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[3]

(f) Give **three** design features of the educational toy that would ensure the safety of the user.

1 .....

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2 .....

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3 .....

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[3]

(g)* Many toys are manufactured in one country and sold throughout the world.

Discuss the advantages and disadvantages of globalisation for manufacturers and consumers.

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..... **[6]**

SECTION B

Answer **all** the questions.

You are advised to spend 50 minutes on this section.

17 Fig. 2 shows a metal bracelet.

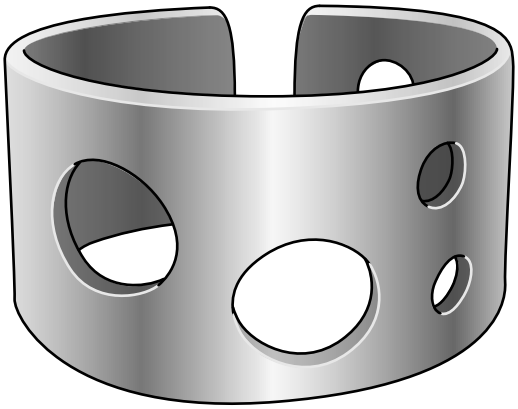

Fig. 2

(a) Name **one** suitable non-ferrous metal from which the bracelet could be made.

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

(b) Explain **two** reasons why your chosen metal is suitable for making the bracelet.

1 .....

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2 .....

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[4]

(c) Fig. 3 shows the flat strip of metal from which the bracelet shown in Fig. 2 is to be made.

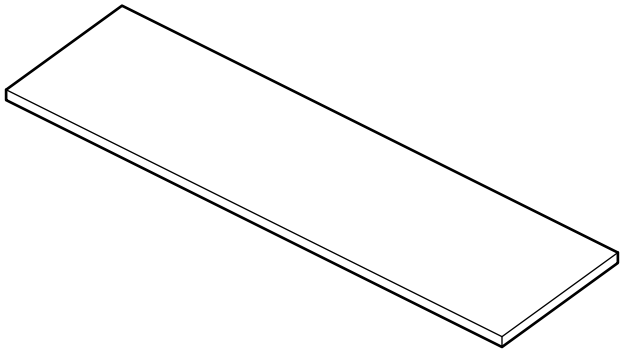

Fig. 3

(i) State an appropriate thickness for the strip of metal.

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

(ii) Explain how anthropometric data could be used to determine the total length of the metal strip for the bracelet.

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

(d) The table below shows three of the processes used to make the bracelet by hand. Complete the table by naming the tools you would use to carry out each task.

Process	**Tool(s) required**
Cut metal sheet to length	
Form holes in sheet metal	
Smooth cut edges	

[3]

(e) Use sketches and notes to show how the metal strip could be curved to shape.

Include details of any tools and their method of use.

[4]

18 Fig. 4 shows a storage unit for a mobile phone and accessories.

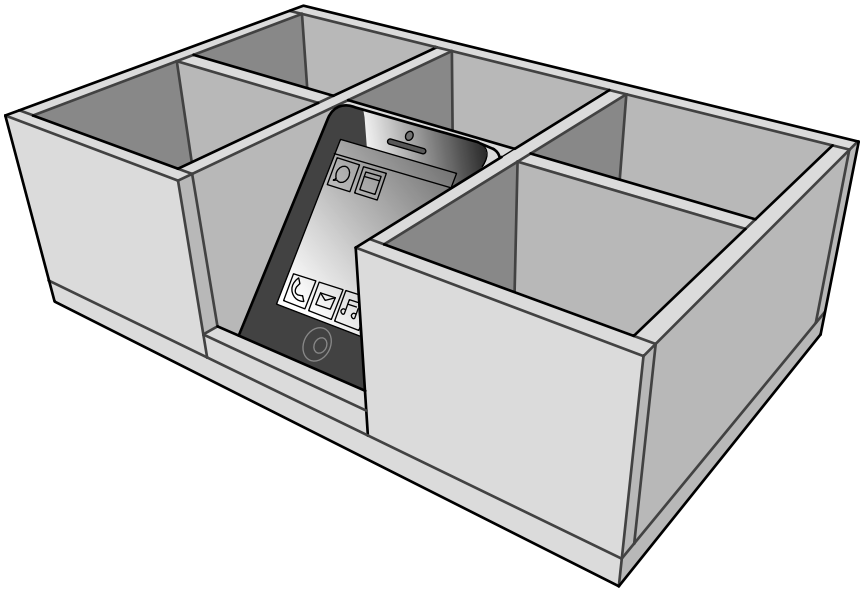

Fig. 4

(a) Give **one** reason why 5 mm thick acrylic would be suitable for making the storage holder.

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

(b) Explain **two** reasons for modelling the storage unit before making it from acrylic.

1 .....

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2 .....

.....

[4]

(c) Use sketches and notes to describe how the parts of the storage unit shown in Fig. 4 would be marked out, cut, finished and fixed together.

Your answer should include details of:

- tools to be used
- finishing techniques
- named adhesive.

[4]

(d)* The storage unit could be designed using computer-aided design (CAD) software.

Discuss the benefits of creating the drawing of the storage unit using CAD compared to drawing it by hand.

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..... **[6]**

19 Fig. 5 shows a storage unit for use in a bedroom.

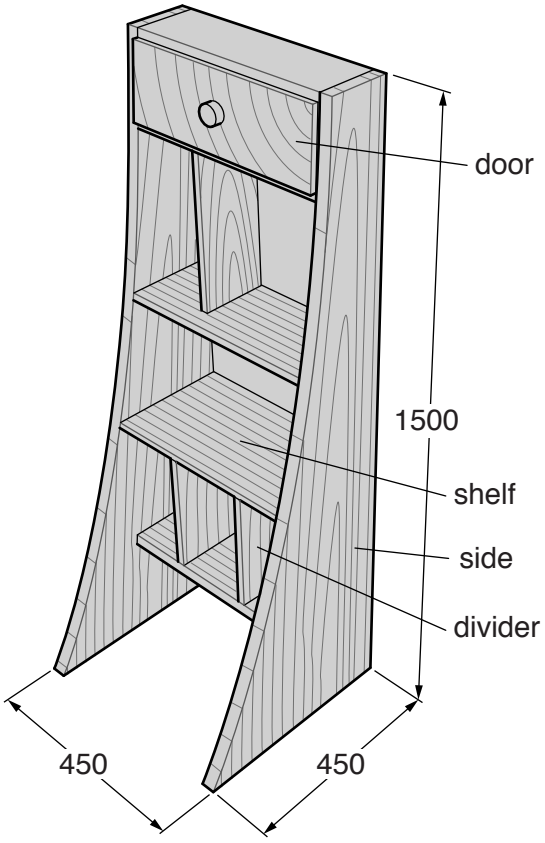

Fig. 5

(a) The unit is to be manufactured from 19 mm thick veneered MDF.

Name **one** suitable hardwood that could be used to veneer the MDF.

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

(b) Explain **two** benefits, other than cost, of using veneered MDF for the unit instead of solid wood.

1 .....

.....

2 .....

.....

[4]

(c) Fig. 6 shows a dowel butt joint to fix the top of the storage unit to the side.

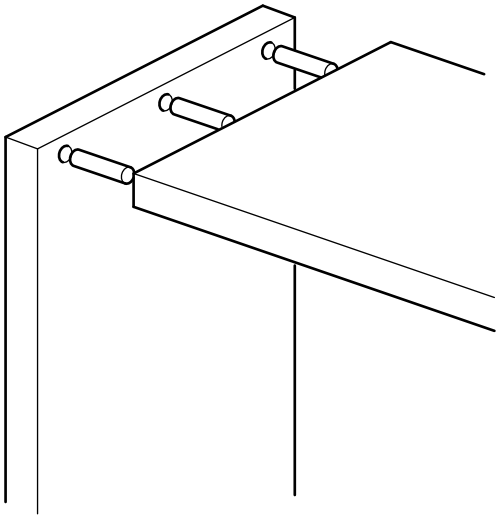

Fig. 6

List **four** stages required to mark out and make this joint.

1 .....

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2 .....

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3 .....

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4 .....

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[4]

(d) Fig. 7 shows a pre-manufactured component to be used on the storage unit.

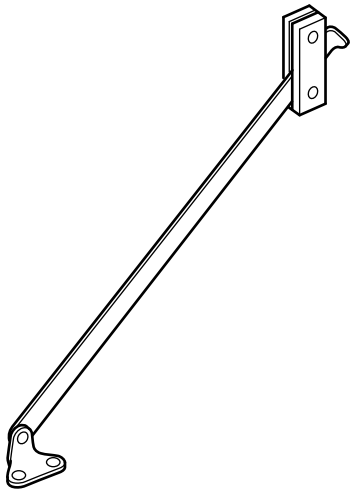

Fig. 7

(i) State the name of this component.

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

(ii) Explain where this component would be used on the storage unit.

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

(e) State **two** possible design issues that might make the storage unit unfit for its purpose.

1 .....

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2 .....

.....

[2]

(f) The veneered MDF is to be finished with a clear coating.

Name a suitable coating for the board.

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

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margins.