

OCR

Oxford Cambridge and RSA

Tuesday 20 June 2017 – Afternoon

GCSE DESIGN AND TECHNOLOGY Graphics

A535/01 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	
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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.
- 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.
- Answer **all** the questions in Section A **and** Section B.
- Do **not** write in the barcodes.

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 **24** pages. Any blank pages are indicated.

SECTION A

Answer **all** questions.

You are advised to spend 40 minutes on this section.

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

- 1 A material that is **not** needed is known as:
- (a) Carbon offset
 - (b) Waste
 - (c) Recycled
 - (d) Biomass
- [1]
- 2 Data giving measurements relating to people is called:
- (a) Ergonomic
 - (b) Acetate
 - (c) Isometric
 - (d) Anthropometric
- [1]
- 3 CO₂ is a:
- (a) Finite energy source
 - (b) Recyclable plastic
 - (c) Greenhouse gas
 - (d) Carbon neutral fuel
- [1]
- 4 Which of the following is an example of tertiary recycling?
- (a) Making playground flooring from car tyres
 - (b) Selling an item at a car boot sale
 - (c) Growing a plant seedling in a toilet roll
 - (d) Changing plastic bottles into fleece fibres
- [1]

- 5 Composting is the breaking down of:
- (a) Organic materials
 - (b) Aluminium cans
 - (c) Thermoplastic packaging
 - (d) Toxic waste
- [1]

6 Give **one** example of using wind power to make electricity.

..... [1]

7 PVC (Polyvinyl chloride) is a recyclable thermoplastic.
Name **one** other recyclable thermoplastic.

..... [1]

8 Complete the name of the ethical organisation by filling in the missing letters below.

Ethical T _ _ _ _ _ I _ _ _ _ _ [1]

9 Name the term used for products that are designed to have a limited or pre-determined life span.

..... [1]

10 State the final stage in a life cycle of a product that is not recycled.

..... [1]

Decide whether the statements below are **true** or **false**.

Tick (✓) the box to show your answer.

	True	False	
11 Soya based inks are environmentally friendly.	<input type="checkbox"/>	<input type="checkbox"/>	[1]
12 Hydropower is a non-renewable energy source.	<input type="checkbox"/>	<input type="checkbox"/>	[1]
13 Biodegradable plastics will eventually rot away.	<input type="checkbox"/>	<input type="checkbox"/>	[1]
14 The Mobius loop symbol shows that a product can be recycled.	<input type="checkbox"/>	<input type="checkbox"/>	[1]
15 Globalisation is an economic process.	<input type="checkbox"/>	<input type="checkbox"/>	[1]

5
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16 Fig. 1 shows a Point of Sale Display stand (POSD) for toothbrushes.

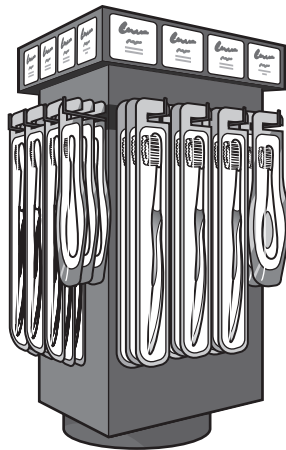


Fig. 1

(a) The toothbrush POSD shown in Fig. 1 can be both functional and aesthetic. Explain the terms functional and aesthetic, giving one example for each.

(i) **Functional**

Explanation

.....

Example

..... [2]

(ii) **Aesthetic**

Explanation

.....

Example

..... [2]

(b) Give **two** reasons why corrugated card has been used for the toothbrush POSD shown in Fig. 1.

1

.....

2

.....

[2]

(c) The toothbrush POSD shown in Fig. 1 is to be manufactured and delivered to the retailer in flat-pack form.

Describe **four** benefits to manufacturers and retailers of using flat-pack products.

1

.....

2

.....

3

.....

4

.....

[4]

- (d) The manufacturer wants to re-design the toothbrush POSD shown in Fig. 1 to make it more interesting to the consumer by adding a smart material.

In the space below, use sketches and notes to show **one** suitable design for a toothbrush POSD that includes a smart material.

The design must:

- Display and hold toothbrushes
- Incorporate a suitable smart material
- Have images and text that appeal to children and parents.

SECTION B

Answer **all** questions.

You are advised to spend 50 minutes on this section.

17 Fig. 2 shows a playing card packet.

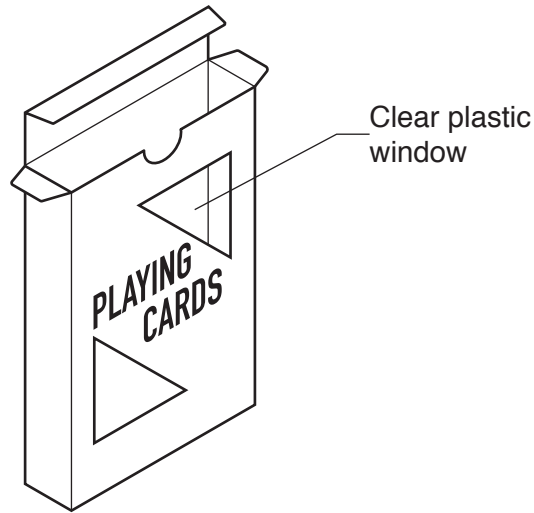
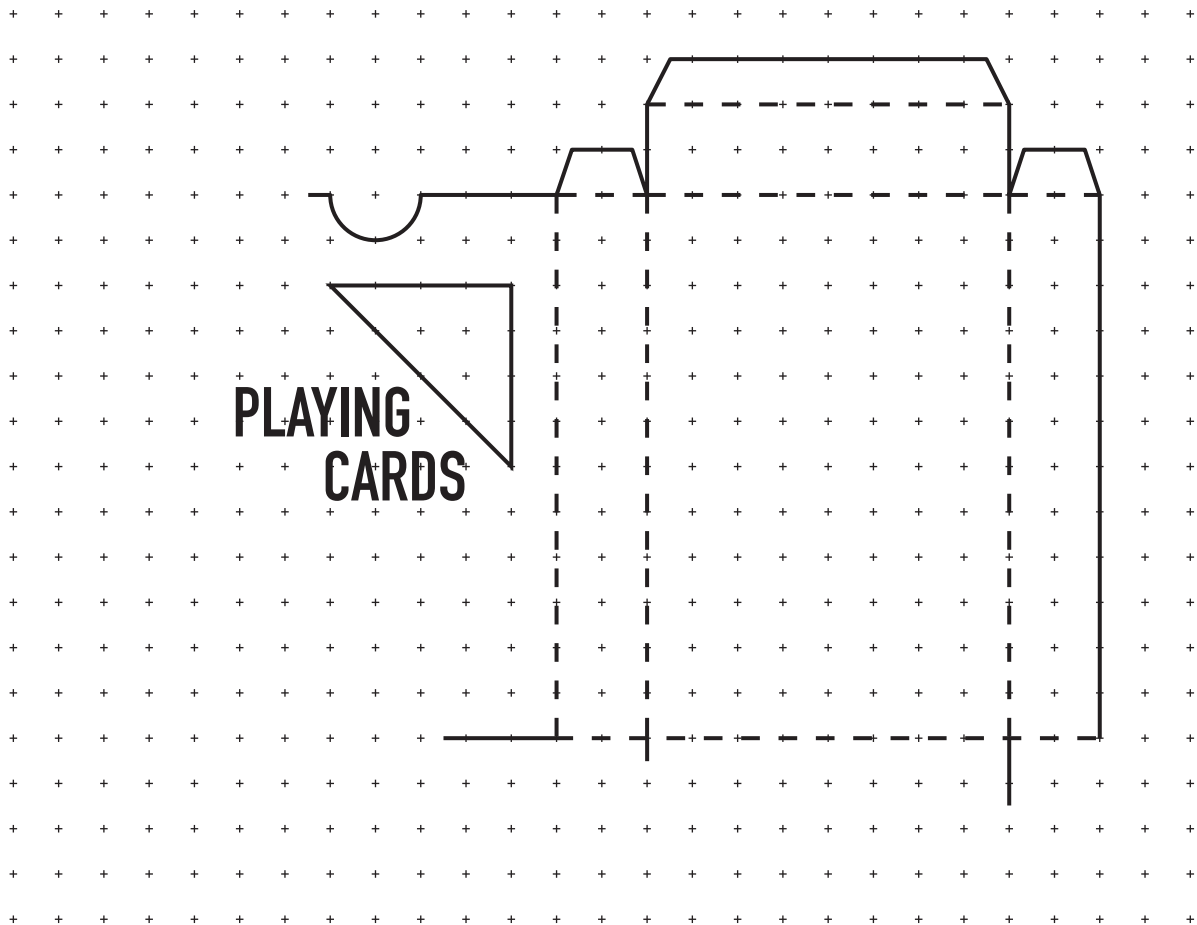


Fig. 2

(a) Complete the development (net) of the playing card packet below.



- (b) The overall size of the playing card packet net is 170 mm × 146 mm.
 The nets are to be cut from one piece of card.
 Tick (✓) the smallest size of card that the net could be cut from.

A1	A2	A3	A4	A5

[1]

- (c) The playing card packet is to be made by hand.
 Complete the table below to show **one** tool, piece of equipment or adhesive used to make the packet for each of the processes listed in the table.

Process	Tool, piece of equipment or adhesive
Drawing out the net onto card	
Cutting out the net	
Scoring the fold lines	
Assembling the net	

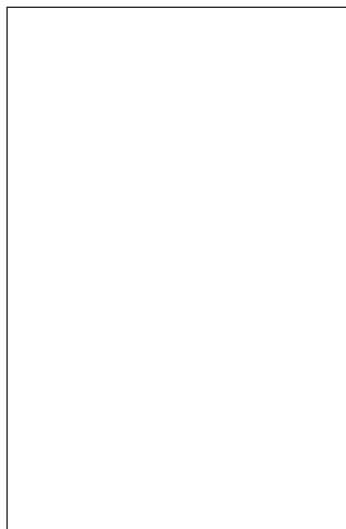
[4]

- (d) The playing card packet has two clear windows.
 Tick (✓) the most suitable material for the clear windows.

Acetate	3 mm Acrylic	1 mm Acrylic	HIPS	Foam board

[1]

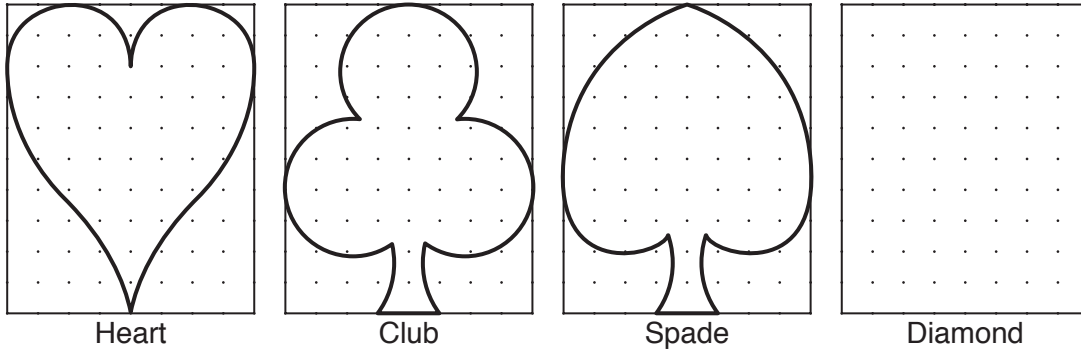
- (e) The designer of the playing card packet wants the back of the packet to look like it is made from softwood.
 On the outline below, add appropriate texture to make it appear to look like softwood.



[1]



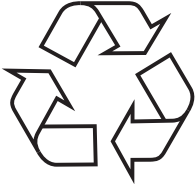
Turn over

- (f) Pictures of the four different suits are to be printed on the back of the packet. Complete the missing outline of the diamond in the box provided below. The diamond must:
- fit inside the box provided
 - have the same overall height and width as the other three pictures.



[1]

- (g) A symbol is to be printed onto the playing card packet to show the playing cards meet British standards. Tick (✓) the British standards symbol below.

			Item removed due to third party copyright restrictions

[1]

18 Fig. 3 shows a plastic wristband for a music festival.

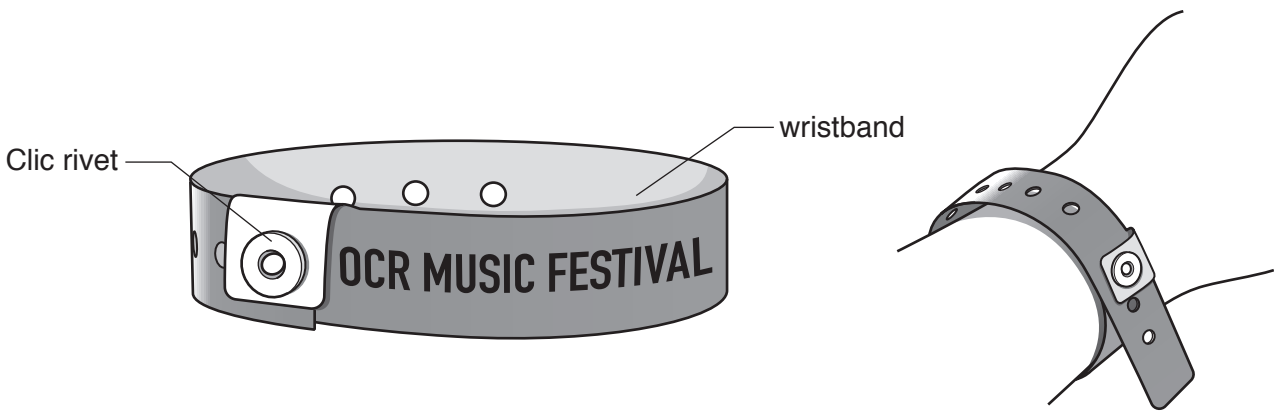


Fig. 3

(a) (i) State a suitable plastic for the wristband.

..... [1]

(ii) State **one** property of the plastic that makes it suitable for the wristband.

..... [1]

(b) Fig. 4 shows the net of one wristband.

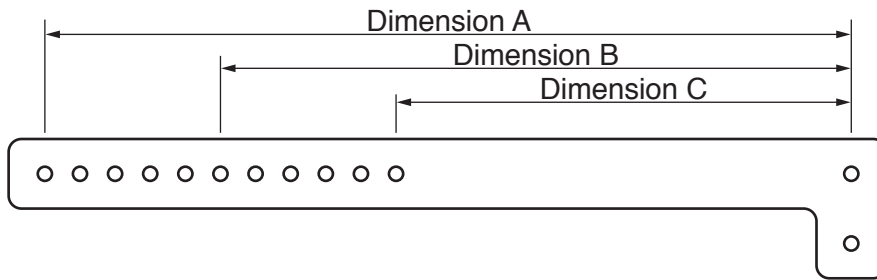
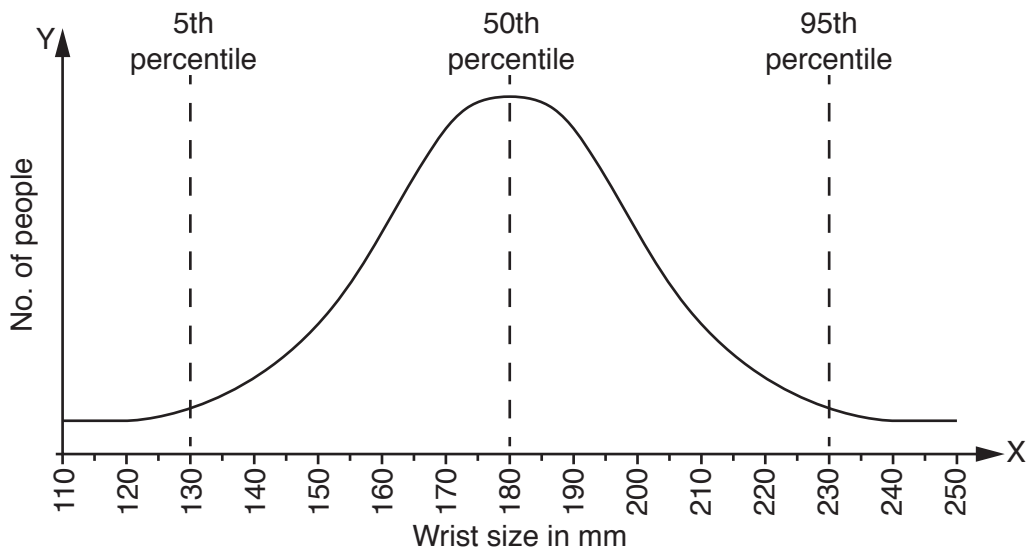


Fig. 4

Anthropometric data has been used to determine the hole positions on the wristband. The chart below shows the anthropometric data collected.



Using the anthropometric data, complete the table below for the dimensions in Fig. 4.

Dimension A	Dimension B	Dimension C

[3]

(c) The wristbands are laid out and cut from sheets of plastic as shown in Fig. 5.

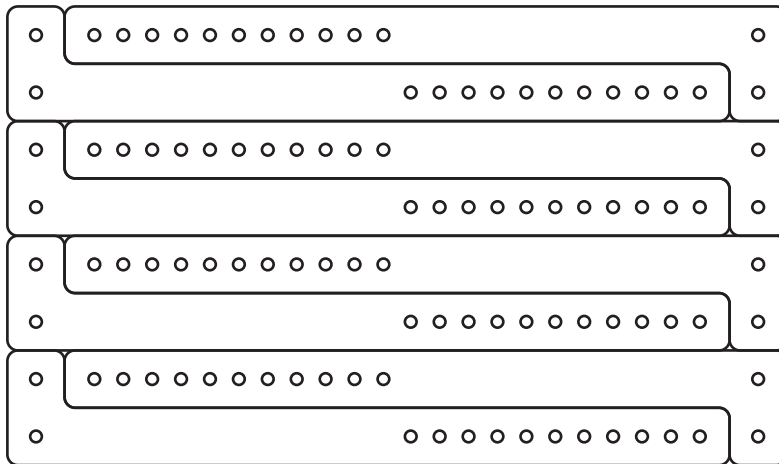


Fig. 5

(i) Give **one** reason why the wristbands are laid out in this way.

..... [1]

(ii) Tick (✓) the correct term used for the layout of the wristbands shown in Fig. 5.

Configuration	<input type="checkbox"/>
Dissemination	<input type="checkbox"/>
Justification	<input type="checkbox"/>
Tessellation	<input type="checkbox"/>
Dissipation	<input type="checkbox"/>

[1]

(d) The wristbands are fastened using a clic rivet.

Complete the sectional view of the wristband below to show the clic rivet.



[2]

- (e) During the music festival different groups will be performing on one of the four stages. The organisers of the festival require a set of signs to show where and when the different groups will be performing.

Use sketches and notes to show **one** idea for a sign.

The sign must:

- be made from a waterproof graphic material
- be free standing
- be able to collapse into flat pieces for storage
- be easy to update
- display information about the different bands, performance times and stage location.

17
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19 Fig. 6 shows a Styrofoam EXIT sign. The sign is to be suspended from the ceiling of a shop.

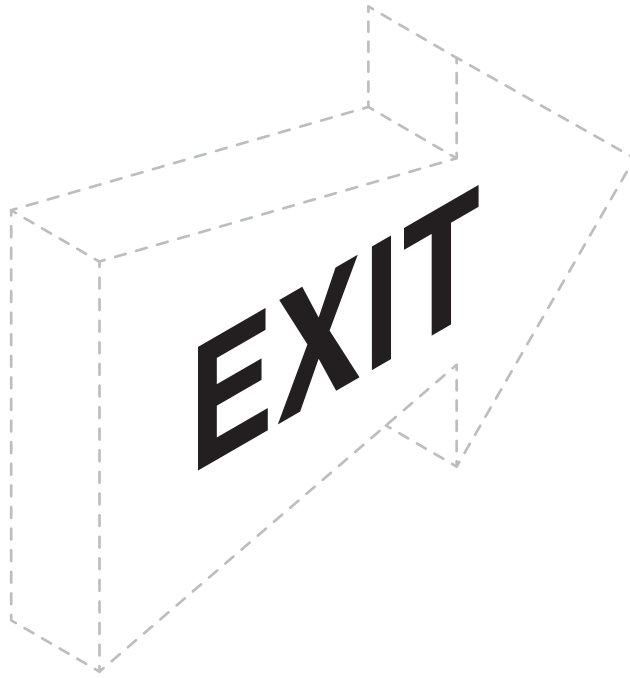


Fig. 6

(a) Apply thick and thin line technique to the drawing in Fig. 6.

[2]

(b) Complete the **two** unfinished orthographic views of the sign below.

The diagram shows an orthographic projection of an 'EXIT' sign. The sign is a rectangle with the word 'EXIT' written inside. On the right side of the sign, there is a right-pointing arrow. The front view is a simple rectangle. The top view is a circle with a center cross. The left view is a trapezoid. The drawing is on a grid with 15 columns and 15 rows.

[3]

(c) The arrow shape for the sign is to be cut from a large sheet of 50 mm thick Styrofoam.

Fig. 7 shows the sheet of Styrofoam with three possible positions for marking out and cutting the arrow shape.

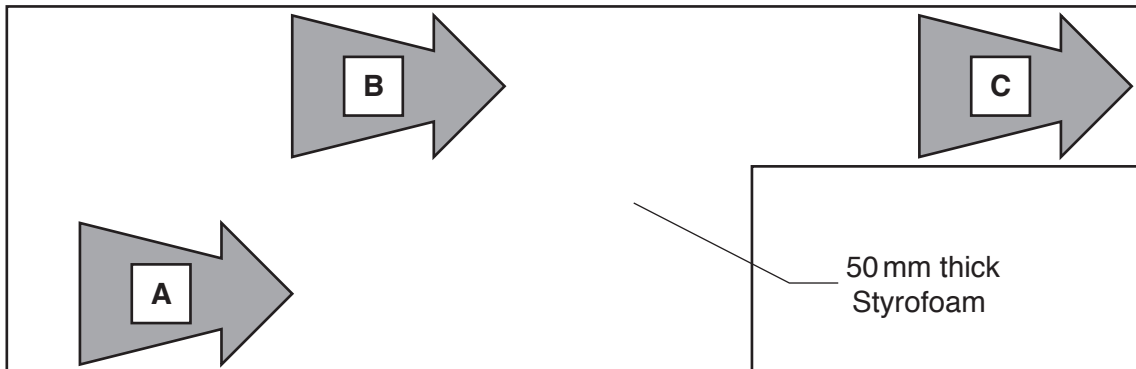


Fig. 7

Tick (✓) the most suitable position for the arrow.

Position A	Position B	Position C

[1]

(d) Name a suitable tool for cutting out the arrow shapes.

..... [1]

(e) The EXIT lettering is to be made and applied to the Styrofoam arrow shape. Describe how the EXIT lettering could be produced using CAD/CAM.

.....

.....

.....

.....

.....

..... [2]

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 margin(s).

A large area of lined paper for writing, consisting of 25 horizontal dotted lines. A solid vertical line runs down the left side of the page, creating a margin. The rest of the page is blank, intended for the student to write their answer.

A large rectangular area with a solid vertical line on the left side and horizontal dotted lines extending across the page, providing a grid for writing answers.



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