



Oxford Cambridge and RSA

Monday 12 May 2025 – Afternoon

**AS Level in Design and Technology:
Product Design**

H006/01 Principles of Product Design

Time allowed: 1 hour 45 minutes



You can use:

- a ruler (cm/mm)
- a scientific calculator
- geometrical instruments



Please write clearly in black ink. **Do not write in the barcodes.**

Centre number

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Candidate number

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First name(s)

Last name

INSTRUCTIONS

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- Answer **all** the questions.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.

INFORMATION

- The total mark for this paper is **90**.
- The marks for each question are shown in brackets [].
- Quality of extended response will be assessed in questions marked with an asterisk (*).
- This document has **24** pages.

ADVICE

- Read each question carefully before you start your answer.

- 1 Table tennis is a sport in which players use a bat to hit a ball back and forth over a net at the centre of a table.

Portable retractable nets have recently been developed for users to access the sport more easily as they can be attached to any table.

Fig. 1.1 shows a portable retractable net attached to a table.

Fig. 1.1



Fig. 1.2 shows a portable net retracted.

Fig. 1.3 shows a portable net partly extended.

Fig. 1.4 shows a portable net extended and being attached to a table.

Fig. 1.2

Fig. 1.3

Fig. 1.4



- (a) Identify a target market for the portable net.

..... [1]

- (b) Identify **two** design constraints that would have influenced the designer in the development of the portable net shown in **Fig. 1.1**.

Justify **each** of your answers.

1

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2

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[4]

- (c) Analyse the design of the table tennis net shown in **Fig. 1.2**, **Fig. 1.3** and **Fig. 1.4**.

- (i) Describe **one** way that the table tennis net design could impact on a user's lifestyle.

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..... [2]

- (ii) Identify and explain **one** improvement that could be made to the aesthetics of the table tennis net design.

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..... [2]

- (d)** It is important for the designer of the table tennis net to learn from existing products.

Discuss the challenges and opportunities for a designer when analysing existing products to inform their design decisions.

Use examples of products in your answer.

..... [8]

- 2 **Fig. 2.1** shows a seat belt, tongue assembly and buckle. The tongue is inserted into the buckle to secure a person in a vehicle.

Fig. 2.2 shows the tongue assembly. It is made from two parts. Part A is a plastic moulding. Part B is a metal plate.

Fig. 2.1



Fig. 2.2



- (a) Identify a suitable metal for part B shown in **Fig. 2.2**.

Justify your answer.

.....

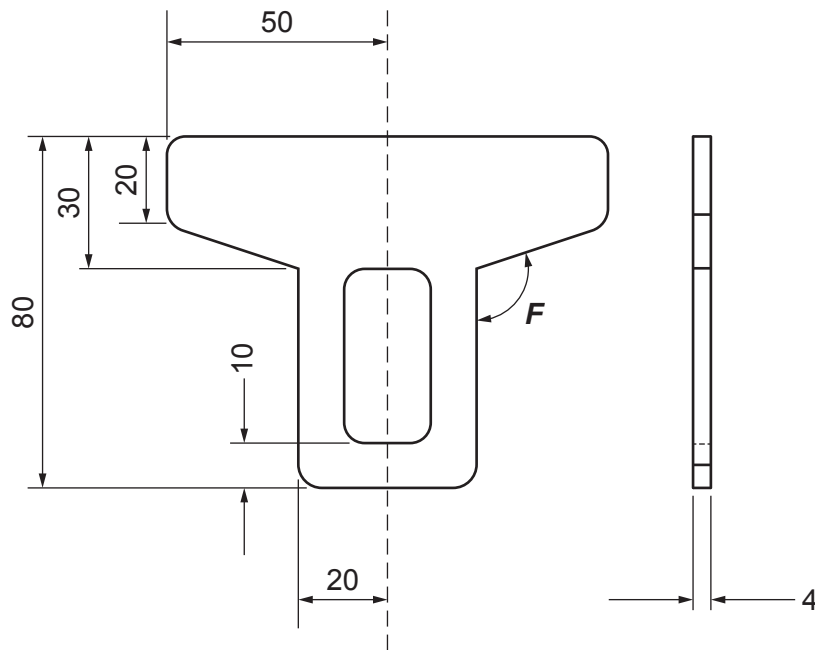
.....

.....

..... [2]

(b) Fig. 2.3 shows the front and side views of part B. All measurements are given in mm.

Fig. 2.3



(not to scale)

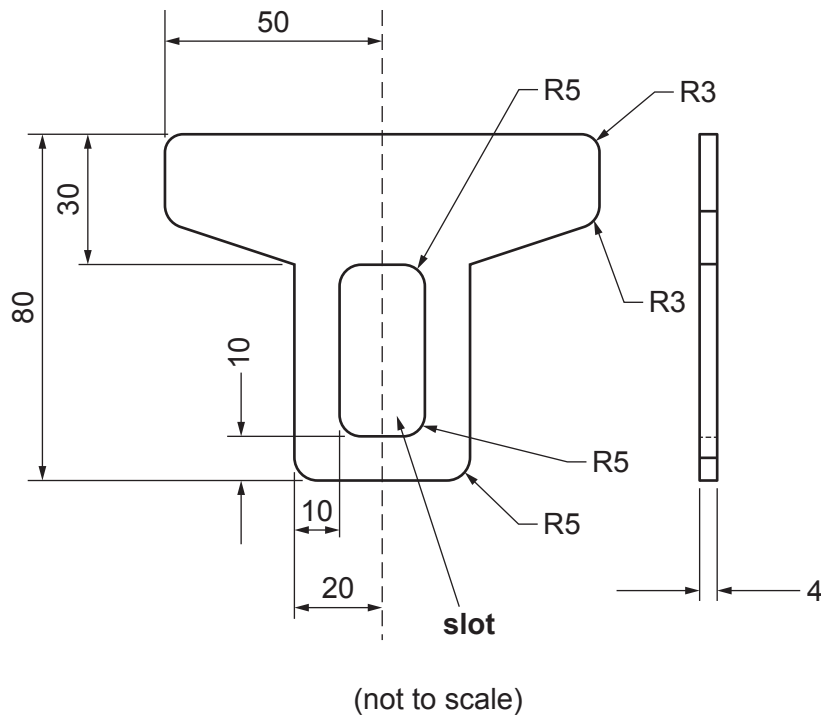
(i) Calculate the angle F shown in Fig. 2.3. Show your working.

[4]

F °

Fig. 2.4 shows the views of part B as shown in **Fig. 2.3**. All measurements are given in mm.

Fig. 2.4



- (ii) The area of the slot without the curved corners is 800 mm^2 .

Calculate the area of the slot shown in **Fig. 2.4**. Give your answer in mm^2 and show your working.

Use the formula: $A = \pi r^2$

where:

A = area of a circle

r = radius

[4]

Area mm^2

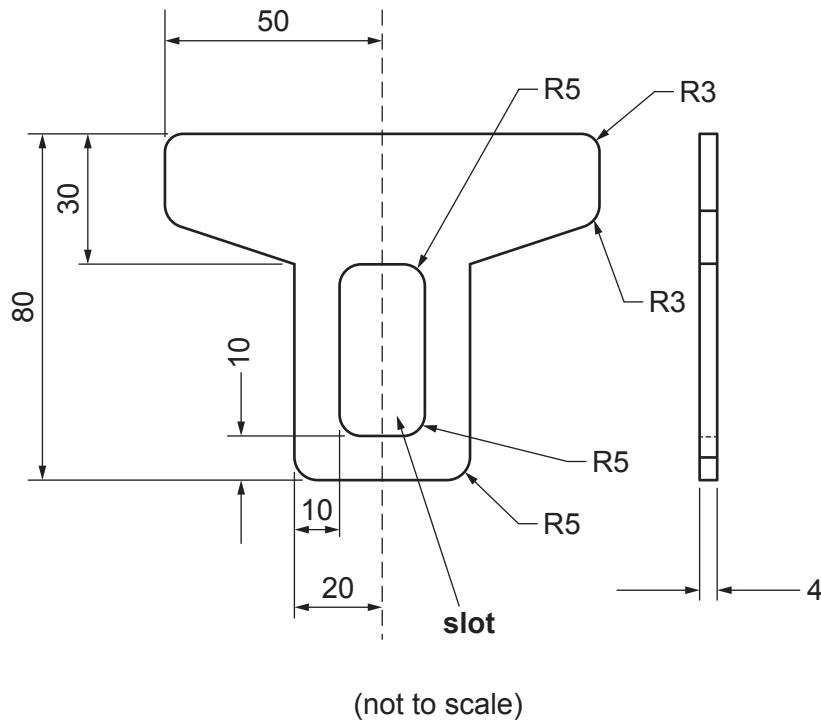
(iii) On the grid on the **page opposite** draw an isometric projection of part B.

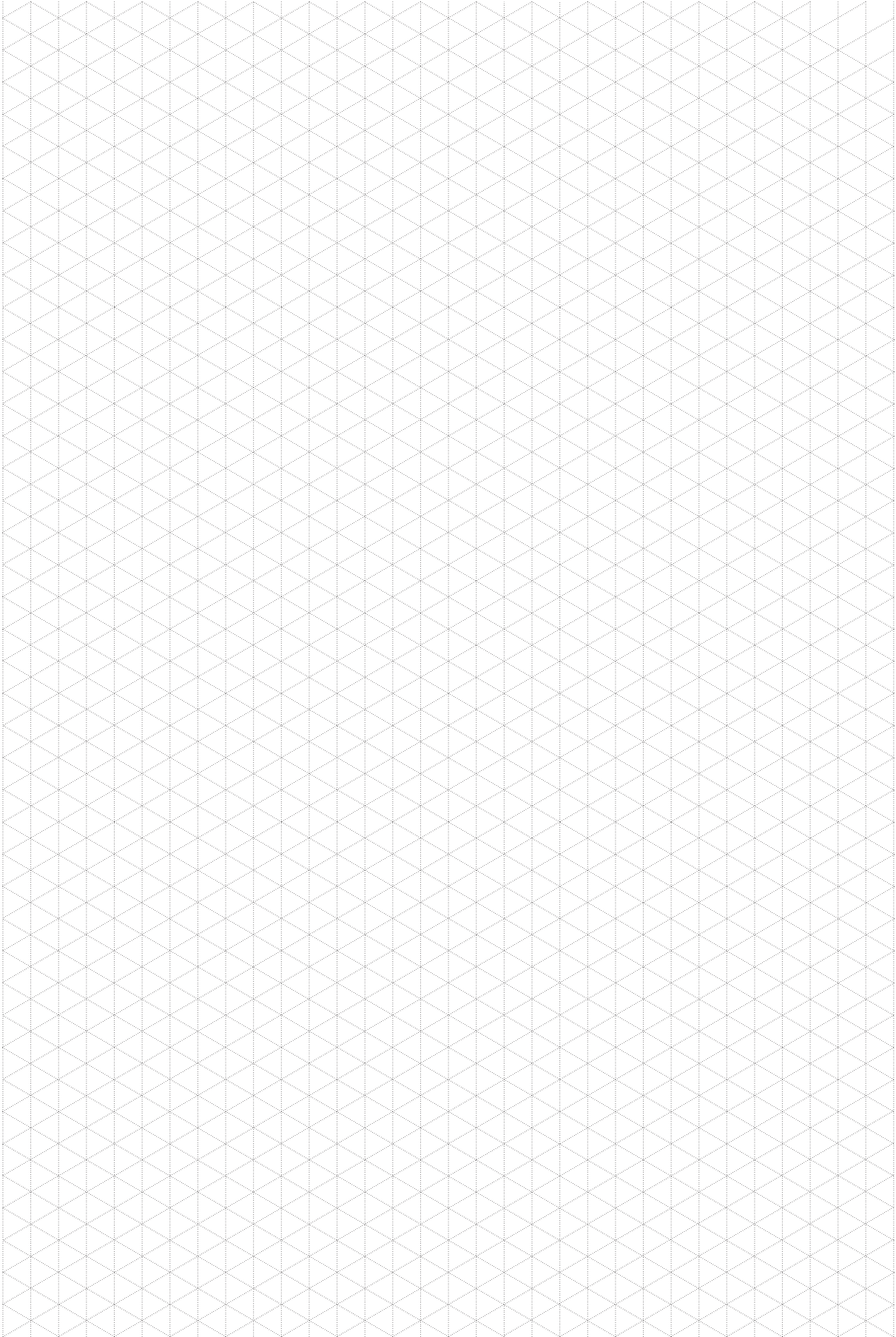
Use the scale 1:5.

Use the measurements in **Fig. 2.4** which is repeated below. All measurements are given in mm.

[6]

Fig. 2.4





3 Fig. 3.1 shows metal drinks cans that are a popular method of packaging cold drinks.

Fig. 3.2 shows the side, top and base view of a drinks can.

Fig. 3.1



Fig. 3.2



- (a) The drinks can shown in **Fig. 3.1** and **Fig. 3.2** is manufactured from an aluminium alloy.

Use annotated sketches and/or notes to show how **the body** shown in **Fig. 3.1** could be manufactured as a batch of 100 000 from an aluminium alloy.

Identify any relevant equipment, machinery and materials.

[5]

(b) Fig. 3.3 shows details of the ring pull used to open the drinks can shown in Fig. 3.1.

Fig. 3.3



- (i) Use annotated sketches and/or notes to show how **the ring pull** shown in **Fig. 3.3** could be manufactured as a batch of 100 000 from an aluminium alloy.

Identify any relevant equipment, machinery and materials.

[5]

- (ii) Identify the method used to join the ring pull to the lid.

Justify your answer.

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..... [2]

- (c) Describe how the manufacturer could minimise waste in the manufacture of the can.

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..... [2]

- (d) Identify and describe **two** physical tests that the manufacturer could carry out to ensure the drinks can meets its intended purpose.

1

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..... [4]

15
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- 4 **Fig. 4.1** and **Fig. 4.2** show two views of playground equipment designed for children aged six to ten years old.

Fig. 4.1



large slide

side part A

side part B

Fig. 4.2



small slide

(a)

(i) Identify a suitable material for the side of the large slide shown in **Fig. 4.1**.

..... [1]

(ii) Identify **two** properties of the material that make it suitable.

Justify **each** of your answers.

1

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[4]

(iii) Identify and explain **two** reasons why the side of the large slide is made in two parts.

1

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[4]

(b) Analyse the playground equipment in **Fig. 4.1** and **Fig. 4.2**.

(i) Explain how anthropometrics has been used in the design of **three** different features of the playground equipment.

Design feature 1

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Design feature 2

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Design feature 3

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[6]

(ii) Explain **two** ways in which the designer has given the playground equipment a long lifespan.

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[4]

(iii)* Discuss the influence of safety considerations on the design of the playground equipment.

Use specific examples of safety considerations in your answer.

[8]

- 5** Past and present designers have influenced the style and function of products from different perspectives.

(a) Identify **two** designers of the present day.

For **each** designer, describe how they have influenced the style of products.

Chosen designer 1

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.....

Chosen designer 2

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[4]

(b)* Discuss the impact of key historical movements on developments in product design.

Use examples of key historical movements and products in your answer.

[8]

END OF QUESTION PAPER

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