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Write your **student number** in the boxes above.

Letter

Product Design and Technologies

Question and Answer Book

VCE Examination – Monday 17 November 2025

- Reading time is **15 minutes**: 11.45 am to 12 noon
- Writing time is **1 hour 30 minutes**: 12 noon to 1.30 pm

Approved materials

- Coloured pencils, water-based pens and markers

Materials supplied

- Question and Answer Book of 20 pages

Students are **not** permitted to bring mobile phones and/or any unauthorised electronic devices into the examination room.

Contents	pages
16 questions (90 marks)	2–19

Instructions

- Answer **all** questions in the spaces provided.
- Write your responses in English.

Use the following information to answer Questions 1–3.

Australians work from home for a multitude of reasons.

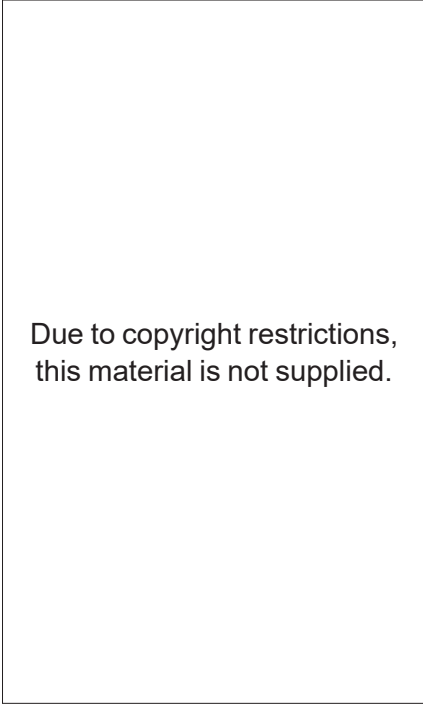
36% of Australians usually work from home

- The main reasons people usually worked from home was to work more flexibly or choose their own hours
- This is followed by operating a business from home or having a home-based job

Source: Australian Bureau of Statistics, Characteristics of Employment, Australia, August 2024, <www.abs.gov.au/media-centre/media-releases/many-casual-employees-enjoy-flexibility-casual-work>; licensed [CC-BY 4.0](https://creativecommons.org/licenses/by/4.0/)

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A home office requires furniture often found in an office; however, a home office is aesthetically different from an office. The office chair shown in Figure 1 was evaluated in a user trial with 50 participants who either ran a business from home or were able to work flexibly from home. The user trial questions (Graph 1 and Graph 2 on the following page) were focused on the visual features of the product and how the product could fit aesthetically into a home office. The results are shown on page 4.



Due to copyright restrictions,
this material is not supplied.

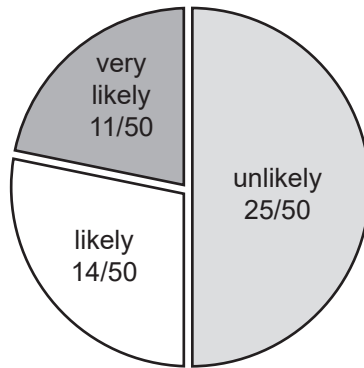
Figure 1

Source: Epic Office Furniture, <<https://epicofficefurniture.com.au>>

User trial – Survey on home office chair preferences

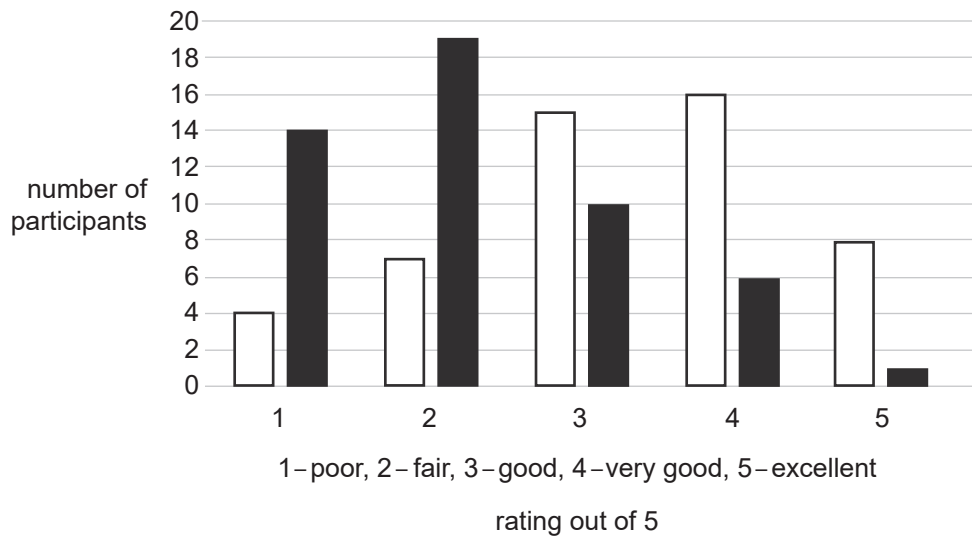
A survey was conducted to find out the home office chair preferences of 50 participants who work from home. The results are presented below.

Graph 1
Likelihood of selection



Key unlikely likely very likely

Graph 2
Rating of fabric and style



Key fabric style

Do not write in this area.

Question 1 (7 marks)

- a.** Identify the type of data that was collected in this user trial. 1 mark

- b.** Identify **two** ethical research methods that can be used when gathering data. 2 marks

- c.** Using the information in Graph 2 of the user trial, interpret which feature was rated more highly overall. 1 mark

- d.** Using the results from both graphs, synthesise the feedback and summarise the findings in your response. 3 marks

Question 2 (5 marks)

- a.** A design can be improved or enhanced in response to feedback from end users. Based on the information provided, identify **two** areas in which the design of the home office chair could be improved or enhanced. 2 marks

- b.** Using the results from Graph 1 and Graph 2, justify **one** of the areas identified in your response to **part a**. 3 marks

Question 3 (3 marks)

The factors that influence product design are also used to evaluate a product. One of those factors is end users.

The two visualisations below show variations of home office chairs for people who work from home.

Add a total of **three** annotations to the visualisations below to highlight features of the chairs that are relevant to the end user.



Sources: yulicon/Shutterstock.com (LHS); Velox Raptor/Shutterstock.com (RHS)

Use the following information to answer Questions 4–11.

A pram plays a central role in the everyday life of a child. This innovative Greentom pram is based on a single-frame construction that can be combined in a variety of changeable positions as shown below. The seats allow parents to easily adjust the pram to suit the various stages of their child’s growth from newborn to four years of age. The Greentom pram features an ergonomic design suitable for flexible everyday use. After use, the Greentom pram’s materials can be recycled and reused.



Figure 2

Greentom prams are made from high-quality recycled materials that offer reliable and consistent performance. A lifetime warranty is offered on the pram frame. The Greentom frame is made from 5.5 kg of high-quality recycled polypropylene plastic and 74 recycled polyethylene terephthalate (PET) bottles.

To make the frame, recycled plastics are sorted, cleaned and shredded into flakes. These flakes are the raw material for the frame components. To make the fabric, recycled plastic drinking bottles are sorted, cleaned and shredded into flakes. These flakes become the yarn that the seat fabric is made from. Virgin plastics are made from raw materials that have not been previously used, whereas repurposed plastics are produced from recycled plastic materials. Virgin plastics are sourced from fossil fuels, a non-renewable resource. The use of virgin plastics can have a larger impact on the environment during production.

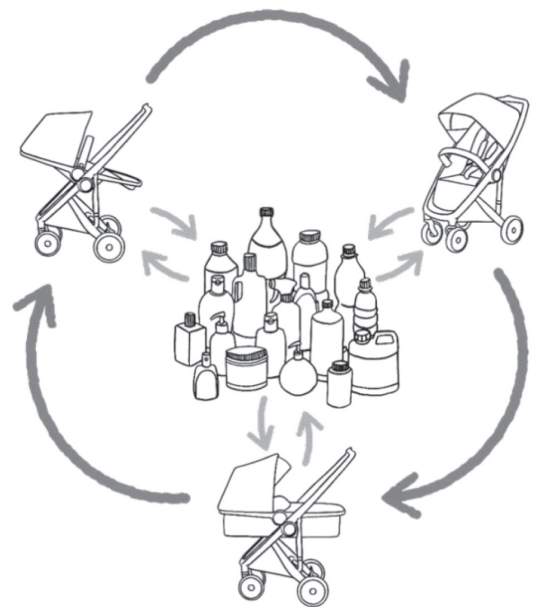


Figure 3

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Question 4 (4 marks)

Analyse how ethical considerations have been addressed in the design of the Greentom pram.

Question 5 (4 marks)

Compare and critique the environmental impacts of manufacturing with repurposed plastics to those of virgin plastics.

Question 6 (8 marks)

The sustainability strategy known as the 6Rs (Rethink, Refuse, Reduce, Reuse, Recycle, Repair) encompasses a holistic approach to design.

Critique the Greentom pram in relation to its application of 'Rethink', 'Reduce' and 'Recycle'.

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Question 7 (4 marks)

Discuss the importance of research and development when creating the Greentom pram. In your response, refer to **two** areas of research the designers may have investigated.

Question 10 (2 marks)

Discuss **one** way in which the use of new and emerging technologies may address an ethical consideration of the Greentom pram.

Question 11 (4 marks)

The Greentom pram is likely to face planned obsolescence in terms of its function at some stage. Identify one benefit and one issue of planned obsolescence for the consumer and the producer.

- **Consumer**

Benefit _____

Issue _____

- **Producer**

Benefit _____

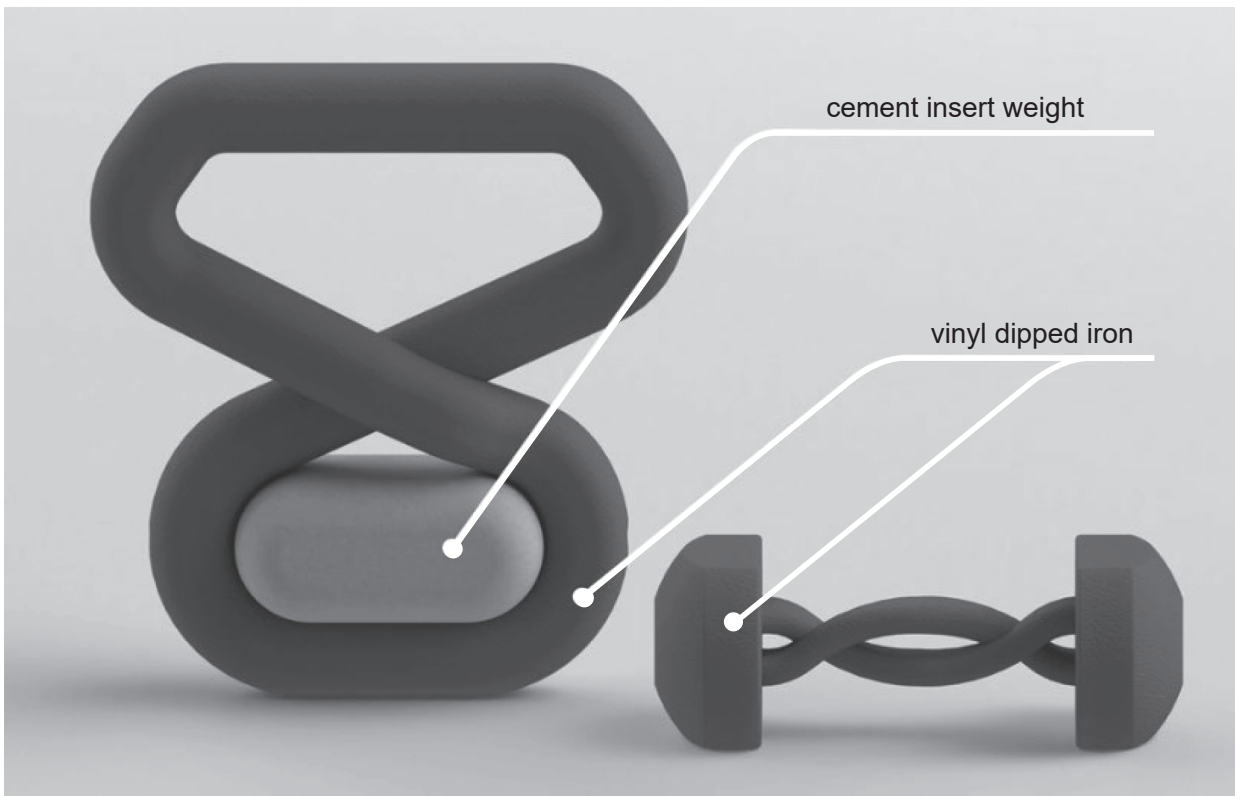
Issue _____

Use the following information to answer Questions 12–14.

Aesthetic home weights



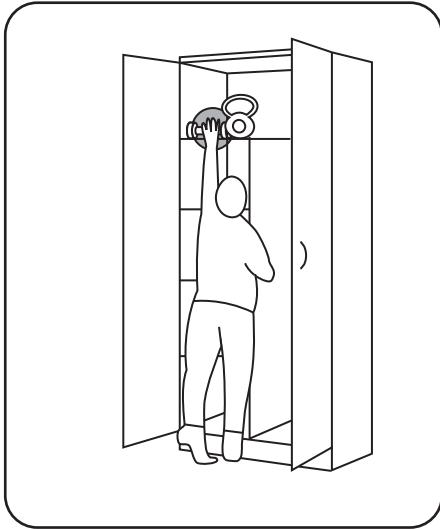
Final design



These aesthetic home weights were designed by industrial designer Liam Lo Cascio as a design project in response to the question ‘How might we better incorporate workout equipment into the home?’

‘Workout equipment is traditionally quite an eyesore and does not tie into the home environment very well. What if your workout equipment was also an aesthetic piece? Something you could leave out and not have to store away. This set includes a dumbbell and kettlebell designed to be left out and admired in the home.’

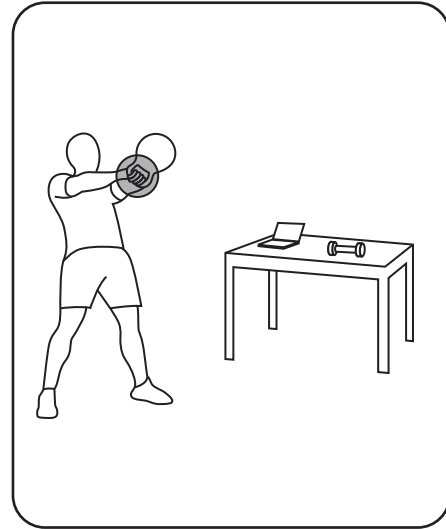
Design problem



To begin his exercises, Jason must remove his workout equipment from storage.

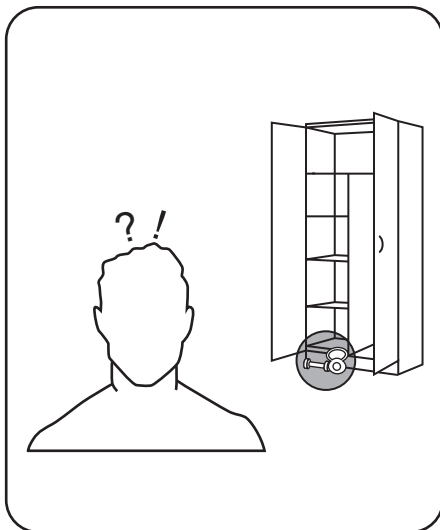
It is very high to reach and has the potential to cause injury to him.

Because the process is quite difficult, Jason finds he lacks motivation to begin his exercises as it is too much effort.



Jason follows the workout provided by his strength and conditioning coach.

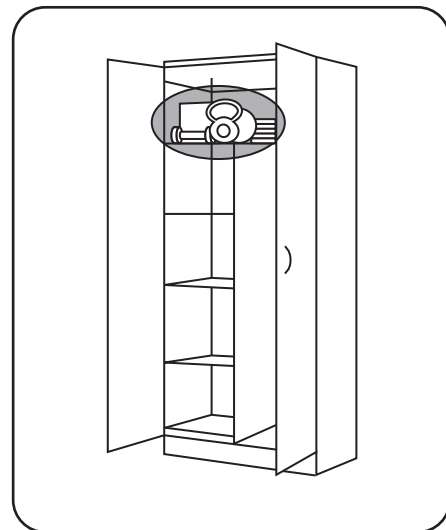
He finds the handle of the kettlebell to be too narrow, making it difficult to get both hands in.



After a tiring workout, Jason has to return his equipment to the cupboard.

His fatigued muscles make this process extremely difficult and dangerous.

If he leaves out his equipment to be put away later, it looks unsightly and makes his home look messy.



Jason wishes he could reclaim some of the storage in his home.

He is sick of having to force things into his cupboards in order to keep his small apartment tidy.

Figure 4

Question 12 (4 marks)

Describe **two** methods that use digital technologies to investigate current market needs in relation to the product.

Question 13 (9 marks)

a. The weights were designed with a focus on their appearance/aesthetics.

Identify one design element and one design principle that the designer has applied to the design of the weights, and critique how the designer has applied these factors.

6 marks

Design element _____

Design principle _____

Critique _____

Do not write in this area.

- b. Referring to aesthetics, make a judgment about how the dumbbell can have a positive impact on end users.

3 marks

Question 14 (2 marks)

The designer of the aesthetic home weights would have generated many product concepts through visualisations, which is an activity that can be found in the second diamond of the Double Diamond design approach.

Explain **one** purpose of creating visualisations.

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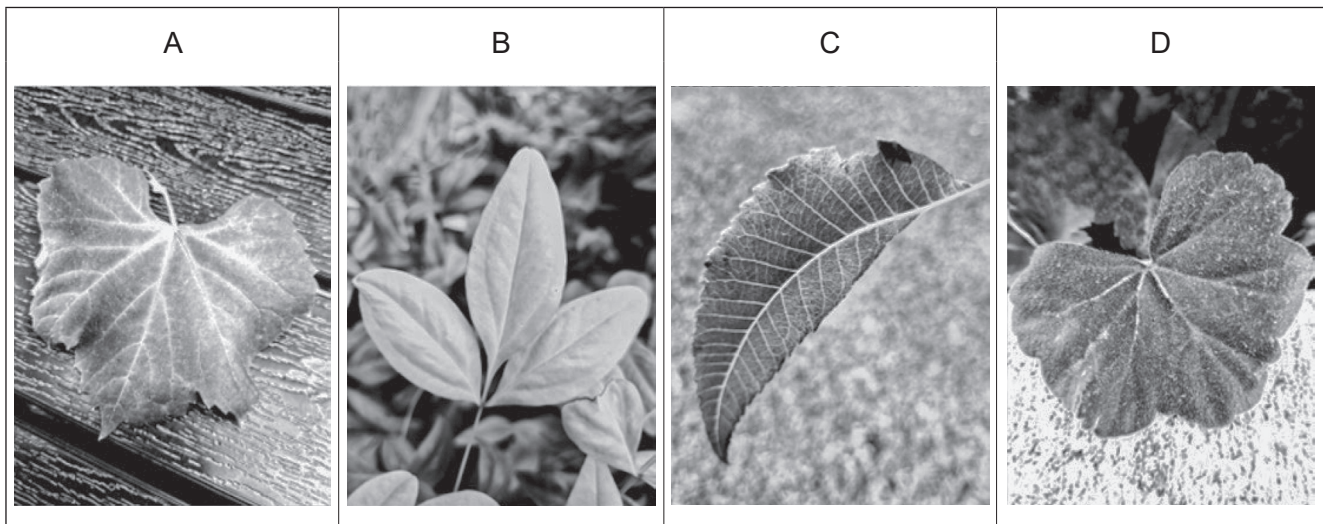
Question 15 (10 marks)

One of the aesthetic home weights on page 12 is a redesign of the traditional kettlebell weight shown below.

**Figure 5**

Source: Stephen Plaster/Shutterstock.com

Consider the following organic leaf shapes.

**Figure 6**

- a. In the boxes provided below, draw and annotate two visualisations of new kettlebell designs using the organic leaf shapes in Figure 6 as inspiration. Each visualisation should combine **at least two** of the organic leaf shapes in the new kettlebell concept.

8 marks

Visualisation 1	Visualisation 2
<p>Organic leaf shapes used as inspiration (circle two):</p> <p>A B C D</p>	<p>Organic leaf shapes used as inspiration (circle two):</p> <p>A B C D</p>

- b. Describe **one** design consideration you included into your visualisations in **part a** to ensure that your kettlebell design would be functional.

2 marks

Do not write in this area.

Question 16 (12 marks)

Cast iron and steel are materials manufactured in Australia and internationally, but production is generally more cost-effective in China. A kettlebell is typically made from cast iron or steel. Cast iron can be more expensive than steel.

Cast iron kettlebells increase in size as their weight increases. Kettlebells made from steel are usually all made to the same size but are hollow on the inside and filled with another material – such as sand – to get the desired weight. Coatings such as vinyl or rubber can be applied to kettlebells to achieve different aesthetics and grip textures. However, the manufacture of these coating materials involves processes that may release hazardous chemicals.

- a. Discuss how a designer or producer may evaluate the selection of materials for a product such as the kettlebell in relation to the social and economic considerations.

6 marks

Social _____

Economic _____

Do not write in this area.

