

STUDENT NUMBER Letter

PRODUCT DESIGN AND TECHNOLOGY

Written examination

Thursday 4 November 2021

Reading time: 9.00 am to 9.15 am (15 minutes)

Writing time: 9.15 am to 10.45 am (1 hour 30 minutes)

QUESTION AND ANSWER BOOK

Structure of book

<i>Section</i>	<i>Number of questions</i>	<i>Number of questions to be answered</i>	<i>Number of marks</i>
A	5	5	45
B	7	7	45
			Total 90

- Students are permitted to bring into the examination room: pens, lead and coloured pencils, water-based pens and markers, highlighters, erasers, sharpeners and rulers.
- Students are NOT permitted to bring into the examination room: blank sheets of paper and/or correction fluid/tape.
- No calculator is allowed in this examination.

Materials supplied

- Question and answer book of 17 pages
- Detachable insert for Section B in the centrefold

Instructions

- Detach the insert from the centre of this book during reading time.
- Write your **student number** in the space provided above on this page.
- All written responses must be in English.

At the end of the examination

- You may keep the detached insert.

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

SECTION A**Instructions for Section A**

Answer **all** questions in the spaces provided.

Use the following information to answer Questions 1 and 2.

**The DOC sofa bunk bed**

The DOC sofa bunk bed converts with one simple movement from a sofa into two single beds with wooden slatted bases.

All covers are fully removable and washable, depending on the fabric used.

- designed and made in Italy
- 2-year warranty on mechanism

The DOC sofa bunk bed is a contemporary sofa solution that was designed with space saving in mind. Its simplicity makes it perfect for apartments, guest rooms, dormitories or holiday homes, among many other applications. It is a sleek and attractive sofa that caters for functionality as much as it does for design.

Source: adapted from 'DOC sofa bunk bed',
<www.bonbon.co.uk/products/doc-sofa-bunk-bed?variant=18926276149317>

DO NOT WRITE IN THIS AREA

Question 1 (14 marks)

- a. Identify **one** potential end user of the DOC sofa bunk bed and outline the context in which this end user would use this product. 2 marks

- b. Prior to the manufacture of the DOC sofa bunk bed, the designer would have worked through the investigating and defining stage of the product design process.
Explain the goals of **two** of the steps of the investigating and defining stage. 4 marks

- c. The visual, tactile and aesthetic product design factors relate to the product’s design elements, such as form, appearance and feel.
Identify **one** design element and explain how this element has been incorporated into the design of the DOC sofa bunk bed to appeal to the end user identified in **part a**. 4 marks

DO NOT WRITE IN THIS AREA

- d. Discuss how user-centred design could have been considered in the design of the DOC sofa bunk bed.

4 marks

DO NOT WRITE IN THIS AREA

Question 2 (9 marks)

- a. The DOC sofa bunk bed could be manufactured on either a low-volume or high-volume production scale.

Compare the benefits and problems of both production scales.

5 marks

- b. Designers use various approaches to incorporate sustainability practices in product design.

Identify one system, model or strategy to assess the sustainability of a product and use it to analyse the sustainability of the DOC sofa bunk bed.

4 marks

System, model or strategy _____

Analysis _____

DO NOT WRITE IN THIS AREA

Use the following information to answer Questions 3–5.



LumiCharge desk lamp – a multifunctional eye-friendly LED desk lamp

Whether you are a student, business owner or simply someone who likes to read before going to bed, you will appreciate all that this lamp has to offer! Not only is this a functional light-emitting diode (LED) desk lamp but it is also a convenient place to charge your mobile phone, making this an all-in-one workstation!

Features

- a 10-watt wireless fast charger and universal phone dock, so that no matter what type of mobile phone you have, you can charge it with ease
- an LED lighting system that contains three different hues and ten levels of brightness, ensuring that you have the lighting that you need for any situation
- a built-in motion sensor that turns the night light on when you enter a dark room, ensuring that you do not run into anything
- a smart LED display that conveniently shows you the time, date, day of the week and temperature
- multiple built-in alarm options
- a memory setting to remember the last hue and brightness that you have used

Home and office decor

Boasting modernity, sophistication and an overall minimalistic presence, this desk lamp will add a stylish touch to your space.

Source: adapted from 'Lumicharge V1.1',
<<https://thelumicharge.com/products/dimmable-led-desk-lamp>>

DO NOT WRITE IN THIS AREA

Question 3 (8 marks)

- a. Explain the importance of research and development for the company or the designer of the LumiCharge desk lamp. 2 marks

- b. Select **one** feature of the LumiCharge desk lamp and explain **one** type of qualitative data that could have assisted the designers with the development of this feature. 2 marks

- c. Identify one new or emerging technology that could have been used in the design of the LumiCharge desk lamp and analyse how this technology could have influenced the design. 4 marks

Technology _____

Analysis _____

Question 4 (6 marks)

Analyse the benefits and problems of planned obsolescence, including associated environmental issues, for both the producer and the consumer of the LumiCharge desk lamp.

Producer _____

Consumer _____

DO NOT WRITE IN THIS AREA


DO NOT WRITE IN THIS AREA

CONTINUES OVER PAGE

**SECTION A – continued
TURN OVER**

Question 5 (8 marks)

The Multifunctional LED desk lamp is another commercial product, similar to the LumiCharge desk lamp.



2 in 1 10W
Wireless Charger & Table Lamp

Wireless Charger
USB Charger

Multifunctional LED desk lamp

Features

- a 10-watt wireless charger and a USB charging port, which means you can charge two devices and use the desk lamp at the same time
- flicker-free light that brightens your space without harming your eyes, which is ideal for reading, working or studying
- multi-angle adjustment – this desk lamp can be adjusted to any angle that you want
- foldable design for convenience
- a touch-sensitive switch panel on the base, allowing you to adjust the hue and brightness of the light

Source: adapted from 'Multifunctional LED Desk Lamp with Wireless Charger',
<www.kogan.com/au/buy/fyy-multifunctional-led-desk-lamp-with-wireless-charger-32688962469985/>

- a. Compare two features of the Multifunctional LED desk lamp to the features of the LumiCharge desk lamp and evaluate these two features.

6 marks

Feature 1 _____

Feature 2 _____

- b. Identify **one** feature of the Multifunctional LED desk lamp that end users may value highly and explain why.

2 marks

**END OF SECTION A
TURN OVER**

DO NOT WRITE IN THIS AREA

SECTION B**Instructions for Section B**

Please remove the insert from the centre of this book during reading time.
 Use the material provided in the insert to answer the questions in this section.
 Answer **all** questions in the spaces provided.

Tick (✓) one product and one location from the lists below. Use this product and location to answer the questions that follow.

Product	
multifunctional bedhead	
dual-purpose sleeping bag	
decorative above-ground firepit	

Location	
coastal region	
forest	

Question 1 (8 marks)

Write one evaluation question for each of the constraints or considerations given in the design brief. Identify how each evaluation question could be checked or tested on the finished product.

Constraint or consideration	Evaluation question	How it could be checked or tested
be suitable for luxury accommodation		
reflect organic shapes and forms of the chosen location		
use materials that are suitable for the product's function		
be designed for adults		

Question 2 (5 marks)

Materials are selected based on their properties and characteristics. Research into materials includes testing their properties and characteristics to determine their suitability for the product.

- a. Identify **one** material property or characteristic needed for your product and describe **one** method to test this property or characteristic. 3 marks

- b. Apart from testing materials, describe **one** other area for research that you would need to explore. 2 marks

DO NOT WRITE IN THIS AREA

Question 3 (4 marks)

Draw one visualisation for your chosen design in the box provided below.

Your response to this question will be assessed against the following assessment criteria.

1	clarity and detail	2 marks
2	suitability/function for intended use of the product	2 marks



Question 4 (12 marks)

Draw one annotated view of your design based on the visualisation from Question 3. This drawing should provide enough detail to clearly show what the whole product will look like.

Your response to this question will be assessed against the following assessment criteria.

1	function/suitability and use of visual, tactile and aesthetic parameters in the design option	4 marks
2	four annotations to explain how the requirements of the design brief have been met	4 marks
3	innovation and creativity	2 marks
4	clarity and detail	2 marks



Question 5 (9 marks)

You will need to use several production processes to construct your product. Name one production process you will use.

Production process _____

- a. Identify what the production process that you have named aims to do and explain why it is suitable for your product. 3 marks

- b. Outline **three** techniques for monitoring the efficiency and/or effectiveness of this production process. 3 marks

- c. Suggest **one** quality measure that could be implemented during this production process. Explain how implementing this quality measure would ensure the overall quality of your product. 3 marks

DO NOT WRITE IN THIS AREA

Question 6 (4 marks)

Name **one** tool or piece of equipment used for the production process named in Question 5.

- a.** Describe **one** potential risk of using this tool or piece of equipment. 2 marks

- b.** Outline how to manage the potential risk described in **part a.** 2 marks

Question 7 (3 marks)

Explain how you would determine the extent to which your finished product meets the needs of the end user(s).

DO NOT WRITE IN THIS AREA

Insert for Section B

Please remove from the centre of this book during reading time.

Design scenario

As more and more people choose to go on holidays in rural and regional destinations of Victoria, the trend towards luxury camping has become increasingly popular. People are also choosing to go on holidays without the need for air travel, because it is environmentally damaging. One of the options available to holiday-makers is an upmarket form of camping known as ‘glamping’. This word is a blend of the words ‘glamorous’ and ‘camping’. Glamping holidays typically include staying in private, tent-like accommodation surrounded by nature and open space, for example, in coastal regions and in forests. Glamping sites are usually equipped with comfortable beds and multipurpose furniture inside a tent.

A newly established Victorian business that focuses on selling luxury products that enhance the glamping experience has invited designers to develop a range of high-quality, creative, modern, innovative products that will reflect the surrounding natural environment.

Of particular interest to the business are: a stylish, multifunctional bedhead, a fashionable, dual-purpose sleeping bag and a decorative above-ground firepit. The design aesthetic of each product must reflect the quality of a luxurious glamping experience.

The products must:

- be suitable for luxury accommodation
- reflect organic shapes and forms of the chosen location
- use materials that are suitable for the product’s function
- be designed for adults.

Select **one** product from the list below.

Product 1

Multifunctional bedhead
• includes a foldaway side table suitable to use for having meals
• includes a functional feature other than a mobile phone docking device
• is a freestanding unit

Product 2

Dual-purpose sleeping bag
• is functional while reading or eating in bed
• is adaptable to an inside and/or outside use other than sleeping
• is adaptable to both hot and cold conditions

Product 3

Decorative above-ground firepit
• has a decorative outdoor design
• includes a safety feature for collecting hot embers
• includes a cover