

STUDENT NUMBER           Letter

# PRODUCT DESIGN AND TECHNOLOGY

## Written examination

Thursday 3 November 2016

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

Section	Number of questions	Number of questions to be answered	Number of marks
A	13	13	42
B	13	13	48
			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 **design brief** insert for Section B in the centrefold.

#### Instructions

- Detach the **design brief** insert from the centre of this book during reading time.
- Write your **student number** in the space provided above on this page.
- You may use diagrams, notes or sketches to help explain your answers.
- Use the space provided in this book for your design brief drawings.
- All written responses must be in English.

#### At the end of the examination

- You may keep the detached **design brief** 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.

**Question 1** (3 marks)

In the correct order, identify three components that are present in a folio that documents the product design process.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

*Use the following information to answer Questions 2–10.*

**The Focal Upright Locus Leaning Seat**

Due to copyright restrictions,  
this material is not supplied.

Source: [www.touchboards.com/focal-upright-flt-1000-bk-nb/](http://www.touchboards.com/focal-upright-flt-1000-bk-nb/)

<sup>1</sup>**homage** – respect or reverence paid

**Question 2** (1 mark)

The Focal Upright Locus Leaning Seat has been compared to a traditional office chair.

Identify **one** main difference between a traditional office chair and the Focal Upright Locus Leaning Seat.

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**Question 3** (2 marks)

Identify one qualitative and one quantitative method of evaluating the Focal Upright Locus Leaning Seat.

Qualitative method \_\_\_\_\_

Quantitative method \_\_\_\_\_

**Question 4** (3 marks)

A prototype of the Focal Upright Locus Leaning Seat has been produced.

Outline **three** advantages of using a qualitative rather than a quantitative method to research its viability.

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**Question 5** (4 marks)

Describe how performance and durability (parameters) can determine the quality of the Focal Upright Locus Leaning Seat.

Performance \_\_\_\_\_

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Durability \_\_\_\_\_

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**Question 6** (3 marks)

Explain why the Focal Upright Locus Leaning Seat is an example of socially responsible design.

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**Question 7** (2 marks)

Anthropometric data has been used to develop the adjustable seat height of the Focal Upright Locus Leaning Seat.

Define what is meant by anthropometric data.

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**Question 8** (4 marks)

The designer places value on a range of product attributes of the Focal Upright Locus Leaning Seat.

- a.** List two product attributes the designer would value for the Focal Upright Locus Leaning Seat, excluding performance and durability. 2 marks

1. \_\_\_\_\_

2. \_\_\_\_\_

- b.** Select one of the product attributes you have listed in **part a**. Provide one example of how this product attribute would apply to the Focal Upright Locus Leaning Seat. 2 marks

Attribute \_\_\_\_\_

Example \_\_\_\_\_

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**Question 9** (2 marks)

Computer-aided design (CAD) was used to design the Focal Upright Locus Leaning Seat.

Identify **two** ways that emerging technologies, such as CAD, could have an impact on how the Focal Upright Locus Leaning Seat was designed.

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**Question 10** (3 marks)

Identify the manufacturing system method that is most suited to producing the Focal Upright Locus Leaning Seat and explain why this method would be the most effective.

Method \_\_\_\_\_

Explanation \_\_\_\_\_

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**Question 11** (5 marks)

- a. Identify **one** creative design thinking technique. 1 mark

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- b. Identify **one** critical design thinking technique. 1 mark

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- c. How does the use of both creative and critical design thinking techniques help the designer to develop and refine their ideas? 3 marks

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**Question 12** (4 marks)

- a. Identify two quality measures that could be used in the production process. 2 marks

1. \_\_\_\_\_

2. \_\_\_\_\_

- b. Explain how one of the quality measures you have identified in **part a.** improves the quality of the production process. 2 marks

Quality measure \_\_\_\_\_

Explanation \_\_\_\_\_

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**SECTION B****Instructions for Section B**

1. Read the **design brief** insert.
2. Select one product that you intend to design and answer the following questions.

Tick (✓) the product that you intend to design.

low bench stool and low table	
rubbish bin(s) for recycling and non-recycling	
outfit for international street performer	
wearable adornments for a musician	

**Question 1** (2 marks)

Identify **two** constraints or considerations specified in the design brief.

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**Question 2** (1 mark)

Change **one** of these constraints or considerations into an evaluation criterion.

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**Question 3** (4 marks)

Select one property from the list below:

- elasticity
- absorbency
- hardness

Selected property \_\_\_\_\_

- a.** Describe a test that could be completed on your design to assess the selected property. 2 marks

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- b.** What is the significance of the test for your design? 2 marks

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**CONTINUES OVER PAGE**

**Question 4** (18 marks)

Draw and annotate a design option for the product you have selected on page 9. Draw your design on this page.

The product that you intend to design \_\_\_\_\_

Draw and annotate **two** processes from your design option.

Include at least **one** process from the **degree of difficulty list** in the **design brief** insert.

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<b>Assessment criteria</b>	
<b>i.</b> innovation and creativity in the design option	4 marks
<b>ii.</b> drawing, in the boxes, communicates how the processes are constructed and includes at least one process from the <b>degree of difficulty list</b>	4 marks
<b>iii.</b> function/suitability of the design option for intended use	3 marks
<b>iv.</b> use of visual, tactile and aesthetic product design factors in the design option	3 marks
<b>v.</b> annotations, on the design option, that indicate how the requirements of the design brief have been met	2 marks
<b>vi.</b> clarity and detail of drawing in the design option	2 marks

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**Question 5** (4 marks)

- a. Identify two visual, tactile and aesthetic principles from the product design factors that you have used in your design. 2 marks

1. \_\_\_\_\_

2. \_\_\_\_\_

- b. Explain how you have used one of the visual, tactile and aesthetic principles identified in **part a.** to convey food as the inspiration for your design. 2 marks

Principle \_\_\_\_\_

Explanation \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Question 6** (3 marks)

Identify the stage of the product design process where a designer would make a prototype or toile and explain why this stage is appropriate.

Stage \_\_\_\_\_

Explanation \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Question 7** (3 marks)

Identify and explain the importance of one component you could include in a production plan.

Component \_\_\_\_\_

Explanation \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Question 8** (2 marks)

What **two** actions would ensure that your product meets safety requirements for the end user?

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\_\_\_\_\_

**Question 9** (2 marks)

Your product will need to meet Australian and international standards.

What is the purpose of Australian and international standards?

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**Question 10** (2 marks)

Your product will be mass produced.

Explain how social sustainability could be achieved during production.

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**Question 11** (2 marks)

List **two** ways you could ensure the effectiveness and efficiency of your design planning and production activities.

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**Question 12** (2 marks)

Identify **two** different ways you could present information about the product's features to your client.

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**Question 13** (3 marks)

You need to provide the end user with instructions on how to care for your product.

Identify one instruction you would provide and explain its importance.

Instruction \_\_\_\_\_

Explanation \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**Insert for Section B**

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

**D E S I G N B R I E F**

The Melbourne World Street Food Festival is an event that focuses on street food from every part of the world. It is an environmentally sustainable event held in March at Federation Square in central Melbourne.

The festival celebrates multiculturalism, and how a diverse range of cultures can work and live together harmoniously.

Festival entertainment will include family-friendly music and interactive events. A party atmosphere will be created with carnival-style visual shows.

The organisers want the products that are used by festival stallholders and performers to represent and promote the traditions of the cultures involved. The organisers have requested that a range of products be developed for stallholders and performers, which use food as the inspiration for the design. Designers are asked to consider the cuisines, foods or ingredients, and traditions of the diverse range of cultures taking part in the festival.

The products must be:

- durable
- family-friendly so that people of all ages can use and/or enjoy them
- eye-catching
- environmentally sustainable.

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

<b>Low bench stool and low table</b>
<ul style="list-style-type: none"> <li>• table for two that provides space to support drinks</li> <li>• combines <b>two or more</b> materials</li> <li>• maximum stool height: 400 mm; maximum table height: 600 mm</li> <li>• represents shapes, textures and/or colours that reflect the cuisines, foods or ingredients, and traditions that inspire or make up the dishes sold at the festival</li> </ul>
<b>Rubbish bin(s) for recycling and non-recycling</b>
<ul style="list-style-type: none"> <li>• combines <b>two or more</b> materials</li> <li>• raised 200 mm off the ground</li> <li>• measurements of each bin: maximum height: 1000 mm, maximum length: 600 mm, maximum width: 600 mm</li> <li>• represents shapes, textures and/or colours that reflect the cuisines, foods or ingredients, and traditions that inspire or make up the dishes sold at the festival</li> </ul>
<b>Outfit for international street performer</b>
<ul style="list-style-type: none"> <li>• <b>three</b> pieces of clothing</li> <li>• combines <b>two or more</b> materials</li> <li>• made with a form of surface embellishment</li> <li>• represents shape, texture and/or colours that reflect the cuisines, foods or ingredients, and traditions that inspire or make up the dishes sold at the festival</li> </ul>
<b>Wearable adornments for a musician</b>
<ul style="list-style-type: none"> <li>• <b>three</b> pieces of adornment: shoulder plate (maximum length: 300 mm front and back), earrings and headpiece</li> <li>• combines <b>two or more</b> materials</li> <li>• represents shapes, textures and/or colours that reflect the cuisines, foods or ingredients, and traditions that inspire or make up the dishes sold at the festival</li> </ul>

Your design should include at least **two** processes with a degree of difficulty; **one** of these processes **must** be from the **degree of difficulty** list below.

<b>Degree of difficulty list</b>			
<p style="text-align: center;"><b>Metal</b></p> <ul style="list-style-type: none"> <li>• bronze brazing</li> <li>• cold bending</li> <li>• folding</li> <li>• forging</li> <li>• riveting</li> <li>• rolling</li> <li>• silver soldering</li> <li>• turning (using an engineer's lathe)</li> <li>• welding</li> </ul>	<p style="text-align: center;"><b>Polymers (plastics)</b></p> <ul style="list-style-type: none"> <li>• blow moulding</li> <li>• casting</li> <li>• injection moulding</li> <li>• riveting</li> <li>• turning (using an engineer's lathe)</li> <li>• vacuum forming</li> </ul>	<p style="text-align: center;"><b>Textiles</b></p> <ul style="list-style-type: none"> <li>• boning</li> <li>• buttonhole making</li> <li>• collar making</li> <li>• cuff making</li> <li>• piping</li> <li>• pleating</li> <li>• pocket making</li> <li>• rolled hemming</li> <li>• sleeve insertion</li> <li>• surface decoration</li> <li>• zip insertion</li> </ul>	<p style="text-align: center;"><b>Wood/Timber</b></p> <ul style="list-style-type: none"> <li>• biscuit jointing</li> <li>• crossed housing jointing</li> <li>• dovetail jointing</li> <li>• housing jointing</li> <li>• mortise and tenon jointing</li> <li>• rebate/shoulder butt jointing</li> <li>• routing (decorative edge)</li> <li>• spline and mitre jointing</li> <li>• veneering</li> <li>• wood turning (using a wood lathe)</li> </ul>

**END OF INSERT**