

STUDENT NUMBER Letter

PRODUCT DESIGN AND TECHNOLOGY

Written examination

Wednesday 5 November 2014

Reading time: 11.45 am to 12.00 noon (15 minutes)

Writing time: 12.00 noon to 1.30 pm (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 | 11 | 11 | 38 |
| B | 11 | 11 | 52 |
| | | | 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 white out liquid/tape.
- No calculator is allowed in this examination.

Materials supplied

- Question and answer book of 17 pages, including a detachable **design brief** insert 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)

When applying risk management, there are four steps that help to reduce occupational health and safety (OH&S) hazards and risks. One risk management step has been written for you in the table below.

List the other **three** risk management steps that you would apply throughout production. The steps do not have to be in order.

| | Risk management steps |
|----|------------------------------|
| 1. | |
| 2. | |
| 3. | |
| 4. | check controls |

Use the following information to answer Questions 2–8.

The company, Lifefactory, states in its publicity material that it is aware of its social responsibilities both to users of its products and to the environment. Lifefactory takes a holistic view of the processes involved in manufacturing and the materials used. That is why trusted core materials, such as glass and silicone, are used in so many of Lifefactory’s products.

Reusable by Design

At Lifefactory, we believe in building products that never become obsolete. Our baby bottles are a perfect example. When you invest in Lifefactory glass bottles, you get a modular system designed to grow with your family and perform for years to come.



Reuse the glass bottle throughout your baby’s early years.



Reuse the same bottle by adding a sippy cap during toddler years.



Reuse the bottle for years more with a flat cap as a storage container.



Relove forever as your favorite jar for just about anything.

Source: www.lifefactory.com/reusability

Question 2 (3 marks)

Imagine that you are a market researcher for the Lifefactory baby bottle. List three questions that you could ask a potential client in a questionnaire.

1. _____

2. _____

3. _____

Question 3 (4 marks)

The designers at Lifefactory believe that their clients will value several different attributes related to the design of the Lifefactory baby bottle.

- a. Identify **one** attribute of the baby bottle that designers at Lifefactory would view as important to the client. 1 mark

- b. Explain how this attribute will affect the life cycle of the Lifefactory baby bottle. 3 marks

Question 4 (5 marks)

- a. Define the cradle to cradle concept. 3 marks

- b. Using the Lifefactory baby bottle as an example, describe **one** long-term environmental benefit of the cradle to cradle concept. 2 marks

Question 5 (3 marks)

The designer has ensured that the Lifefactory baby bottle complies with international and Australian standards.

Identify **one** of these standards (international or Australian) and explain **one** step the manufacturer may have taken to ensure that it has been met.

Identify _____

Explain _____

Question 6 (3 marks)

Describe a potential client for the Lifefactory baby bottle.

Question 7 (3 marks)

Identify the most effective place (excluding the internet) where the Lifefactory baby bottle might be sold and justify why this place would be suitable.

Identify _____

Justify _____

Question 8 (3 marks)

Identify **one** specific form of promotion for the Lifefactory baby bottle and explain why you have chosen this specific form of promotion.

Identify _____

Explain _____

Question 9 (3 marks)

Identify **one** form of obsolescence and provide **one** problem of this form of obsolescence.

Form of obsolescence _____

Problem _____

Question 10 (2 marks)

The design of a product is influenced by a range of aspects (parameters).

Use an example to explain the difference between the primary function and the secondary function of a product.

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 retail shop that you intend to design for.

| | |
|------------|--|
| organic | |
| industrial | |

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

| | |
|--|--|
| outdoor winter clothing outfit | |
| multi-function unit | |
| multi-function floor lamp | |
| coordinated personal ornamental attire | |

Question 1 (4 marks)

- a.** Identify **one** constraint from the design brief. 1 mark

- b.** Change this constraint into an evaluation criterion question. 1 mark

- c.** Explain how you are going to resolve this constraint. 2 marks

Question 2 (4 marks)

Identify **one** specific material that you will use in your design.

Describe, in detail, the research that you will undertake in relation to this material and explain how this research will influence your design.

Describe _____

Explain _____

Question 3 (2 marks)

During the design and development stage of your design, you will use various sources, such as the internet, and other products to develop your design.

What is your responsibility, as a designer, during this stage?

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Question 4 (18 marks)

Draw and annotate a design option for the product you have selected on page 8.

Draw your design on this page.

Draw and annotate **two** processes from your design option using the boxes and lines provided. Include **one** process from the **degree of difficulty list** in the **design brief** insert.

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

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Question 5 (3 marks)

Indicate with a tick (✓) which style you have chosen for your design.

organic

industrial

Describe how you have met the requirements of this style in your design.

Question 6 (3 marks)

Describe the benefits of a low-volume manufacturing system.

Question 7 (3 marks)

Identify **one** component of the production plan for your design and explain the role of this component in the production plan.

Identify _____

Explain _____

Question 8 (3 marks)

You sent the successful design option to the manufacturer.

Explain why it was inappropriate to send the design option to the manufacturer.

Question 9 (5 marks)

The product may go through some modifications during production.

a. Identify **one** modification that may occur during production. 1 mark

b. Identify **one** communication technique that you would use to explain the modification of the product to your client. 1 mark

c. Justify why this modification would have occurred. 3 marks

Question 10 (4 marks)

Quality measures will be implemented during the production of your product.

Identify **one** quality measure that will be implemented and describe why this method would work well during the production process.

Identify _____

Describe _____

Question 11 (3 marks)

Identify and describe **one** method that you would use to evaluate the effectiveness of this quality measure in relation to the finished product.

Identify _____

Describe _____

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

D E S I G N B R I E F

Hayley Peters is a retailer who has two small but very exclusive shops in an upmarket shopping complex. In both shops, a special range of handmade, one-off products is sold. In one retail shop, products that have an 'organic' style are sold, while in the other retail shop, products that have an 'industrial' style are sold.

- The organic style has its foundations in the natural world.
- The industrial style has its foundations in the mechanical world.

The products for sale include clothing, furniture and personal ornamental attire. The stock in both shops has been selling well, so Hayley wishes to expand her range.

You, as a designer/producer, have been asked to design and produce some products that would be appropriate for **one** of the shops, in either the organic **or** the industrial style.

The products are required for the winter retail cycle, which commences in April.

The retailer wants the products to combine **two or more** materials in a decorative way.

| Organic style | Industrial style |
|--|---|
| <ul style="list-style-type: none"> • curves • gentle shapes • cave-like • nature-based • soft textures • Art Nouveau | <ul style="list-style-type: none"> • clean, sharp lines • streamlined • hard lines and hard surfaces • cogs, wheels, nuts and bolts • abrupt connections • cubism |

TURN OVER

SELECT A PRODUCT

| |
|--|
| Outdoor winter clothing outfit |
| <ul style="list-style-type: none"> • winter cape • two coordinated pieces of clothing to be worn underneath the cape • head covering • must combine two or more materials |
| Multi-function unit |
| <ul style="list-style-type: none"> • maximum size: 1000 mm in length × 1000 mm in height • minimum of two functions from this list: seat, storage unit, side table, drawer • has a space between the floor and the unit • combines two or more materials |
| Multi-function floor lamp |
| <ul style="list-style-type: none"> • maximum height: 1800 mm • includes a shelf that provides safe, secure storage • provides lighting at two levels, with one lighting level suitable for reading • combines two or more materials |
| Coordinated personal ornamental attire |
| <ul style="list-style-type: none"> • three pieces chosen from this list: scarf clip, headpiece, tie clip, pair of cufflinks, pair of earrings • one piece must feature an innovative method of fastening • minimum length of 100 mm for scarf clip and headpiece; minimum length of 50 mm for tie clip; a total minimum length of 50 mm for pair of cufflinks or pair of earrings • combines two or more materials |

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.

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

END OF DESIGN BRIEF INSERT