

STUDENT NUMBER Letter

PRODUCT DESIGN AND TECHNOLOGY

Written examination

Wednesday 4 November 2015

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	12	12	45
B	11	11	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 16 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

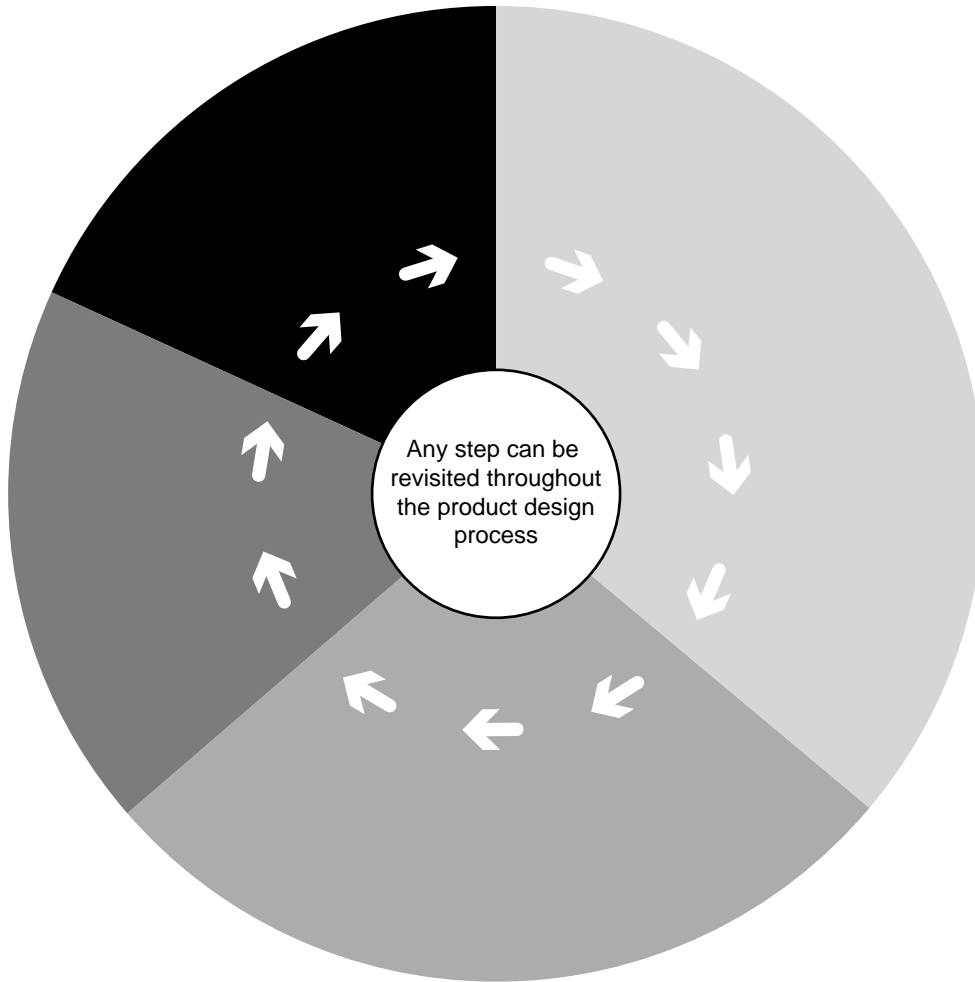
- You may keep the detached **design brief** insert.

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.

The product design process: Stages and steps



Question 1 (3 marks)

In the table below, identify three steps from the stages of the product design process. The planning and production stage has been completed for you.

Stage	Step
investigating and defining	
design and development (conceptualisation)	
planning and production	<i>production plan or production</i>
evaluation	

Use the following information to answer Questions 2–8.

Cellet Hand Stand for Tablet Devices

Due to copyright restrictions,
this material is not supplied.

Source: © Cellet Products, Inc.

Question 2 (3 marks)

The primary function of the Cellet Hand Stand is to hold a tablet device.

- a. Identify a secondary function of the Cellet Hand Stand.

1 mark

- b. Explain the importance to the end user of the secondary function that you have identified in part a.

2 marks

Question 3 (3 marks)

The role of research and development is very important in the development of a new product.

Identify **one** area of research and explain the importance of carrying out this research **before** the Cellet Hand Stand is manufactured.

Identify _____

Explain _____

Question 4 (3 marks)

Identify **one** design element **or** design principle (parameter) used in the Cellet Hand Stand and explain how this design element or design principle enhances this product.

Identify _____

Explain _____

Question 5 (4 marks)

Explain the benefits of continuous (volume) production to both the manufacturer and the end user of the Cellet Hand Stand.

Manufacturer _____

End user _____

Question 6 (3 marks)

Using the headings below, taken from the five Ps of marketing, design a marketing plan for the Cellet Hand Stand. One example has been completed for you.

People _____

Product free-standing, hand-shaped stand to hold tablet devices

Place _____

Promotion _____

Question 7 (4 marks)

- a. Explain what is meant by 'Life Cycle Analysis (LCA)'. 2 marks

- b. Identify **two** stages of the Life Cycle Analysis that the designer of the Cellet Hand Stand would need to consider. 2 marks

Question 8 (6 marks)

- a. Identify the three areas of sustainability. 3 marks

- ---
- ---
- ---

- b. Explain the relevance of one of the areas of sustainability identified in **part a.** to the Cellet Hand Stand. 3 marks

Area of sustainability

Relevance

Question 9 (3 marks)

In the product design process, the characteristics and purpose of drawings vary with the type of communication needed.

Identify **one** type of drawing and explain the purpose of this type of drawing.

Identify _____

Explain _____

Question 10 (4 marks)

Define 'IP' and explain why this concept is so important to a designer who is designing a new product.

Define _____

Explain _____

Question 11 (3 marks)

Identify and explain **one** form of obsolescence.

Identify _____

Explain _____

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 style that you intend to use in your design.

sci-fi style	
fantasy style	

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

three-piece coordinated costume for a male or female	
modular tables that will sit on the stage in front of the guests	
exhibitor's or retailer's room divider	
three-piece coordinated personal range of accessories for an attendant	

Question 1 (2 marks)

List **two** characteristics (profile) of your client or end user.

Question 2 (2 marks)

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

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

Question 3 (3 marks)

During the research stage you will test materials.

- a.** Identify **one** form of testing that you would carry out to select the most appropriate material for your design. 1 mark

- b.** Explain why this form of testing is applicable to the product that you will design. 2 marks

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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.

The product that you intend to design _____

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

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

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Question 5 (3 marks)

Identify and explain **one** design feature shown in your design.

Identify _____

Explain _____

Question 6 (3 marks)

Explain why annotations are important when developing a design option.

Question 7 (3 marks)

a. Identify **one** possible risk associated with the production of your product. 1 mark

b. Explain how you could reduce or eliminate this risk from the production process. 2 marks

Question 8 (3 marks)

Modifications to the product can occur at different steps during the product design process.

You have designed your product. Identify **one** step where modifications might occur and explain why they might occur at this step.

Identify _____

Explain _____

Question 9 (2 marks)

If a modification was made at the step identified in **Question 8**, how might the client be involved in making the modification?

Question 10 (3 marks)

Identify and explain the best way to test your finished product to ensure that it meets the needs of the client or end user.

Identify _____

Explain _____

Question 11 (3 marks)

During the product design process, you will need to write an evaluation report.

Explain why an evaluation report is an important part of the product design process.

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

D E S I G N B R I E F

The organisers of the Oz Comic-Con convention are thinking about having young designers create original products that would connect with their audience.

Oz Comic-Con gives fans the opportunity to meet a range of celebrity guests from the worlds of animation, comics, books, television, movies, anime, manga, video games, sci-fi and fantasy. Fans can experience an amazing range of group events, costumes, screenings and information sessions. They can also gain access to exhibitors, retailers, and autograph and photograph sessions.

The organisers of the Oz Comic-Con convention:

- request a creative, original design that supports and enhances the event
- require the products to be appropriate for a family-friendly environment
- require that **all** products reflect the event, that is, relate to animation, comics, books, television, movies, anime, manga, video games, sci-fi or fantasy
- want the products to combine **two or more** materials in a creative and innovative way
- need the products for the opening in June.

The organisers of the Oz Comic-Con convention have provided the young designers with suggestions on the look and feel of the products required.

Sci-fi style	Fantasy style
<ul style="list-style-type: none"> • strong, sharp lines • geometric, angular, clean shapes • sense of balance, movement and action • hard, smooth, metallic, sheer textures • cool, mechanical colours 	<ul style="list-style-type: none"> • gentle, curved lines • organic, graceful, sculptured shapes • calm, magical, mysterious • soft, tactile, harmonious textures • warm, pastel, organic colours

TURN OVER

SELECT A PRODUCT

Three-piece coordinated costume for a male or female
<ul style="list-style-type: none"> • fitted coat • matching knee-length dress or pant suit that can be worn underneath the fitted coat • creative and innovative headpiece or mask • combines two or more materials
Modular tables that will sit on the stage in front of the guests
<ul style="list-style-type: none"> • three modular tables • total maximum dimensions: 1500 mm in length × 600 mm in height • include three separate storage spaces to put a magazine in and/or personal items on • combine two or more materials
Exhibitor's or retailer's room divider
<ul style="list-style-type: none"> • maximum height: 1800 mm • must have 3D surfaces • must include openings, hooks and inserts • combines two or more materials
Three-piece coordinated personal range of accessories for an attendant
<ul style="list-style-type: none"> • neck piece • hand piece that can display time • decorative ear accessory, with wi-fi connection, that provides updates on the Oz Comic-Con convention's program of events • one piece must feature an innovative method of fastening • 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