



**Victorian Certificate of Education
2006**

SUPERVISOR TO ATTACH PROCESSING LABEL HERE

STUDENT NUMBER

Figures
Words

Letter

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DESIGN AND TECHNOLOGY

Written examination

Monday 6 November 2006

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	3	3	35
B	4	4	47
			Total 82

- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers, coloured pencils, markers, a shape template and a female human figure template and a male human figure template.
 - 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 10 pages with 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.
 - All written responses must be in English.
- At the end of the examination**
- You may keep the detached Design Brief Insert.

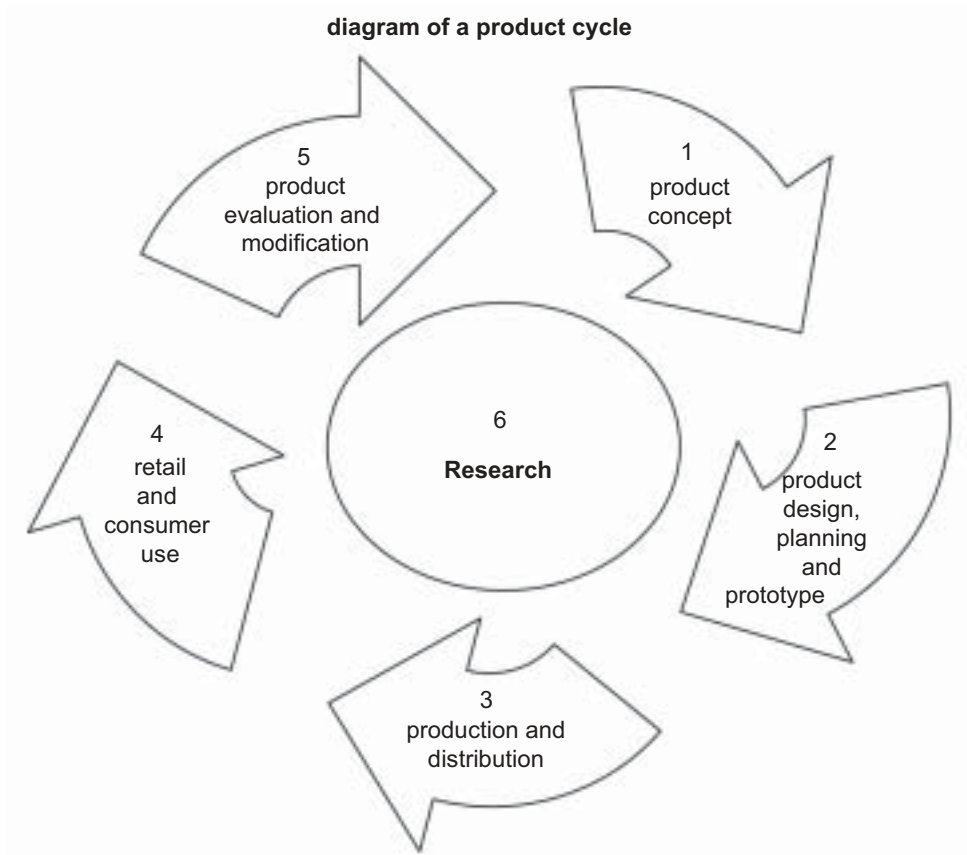
Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

SECTION A

Instructions for Section A
 Answer **all** questions in the spaces provided.

Question 1

The diagram below shows a product cycle. Each stage within the product cycle has been given a number.



Oakwood is a company which designs and produces tissue boxes. Oakwood is evaluating the product and is using the product cycle as a guide for the evaluation.

In column 1 of the table below, Oakwood have listed the processes within the tissue box product cycle.

From the diagram above select the correct stage of the product cycle when the process occurs. Write the number for this stage in column 2.

Column 1	Column 2
Process	Stage of product cycle
Investigate existing product designs	
Purchase and use of product	
Generate initial ideas	
Work on practical and technical aspects of the product design	
Suppliers – provide materials and product components	
Gather information on cost, sales and profits	

6 marks

Question 2

Product: Portable Surf Shower

The Portable Surf Shower is a design concept award winner. The designers displayed extensive knowledge in responding to the needs of the intended user.

The Portable Surf Shower contains cold water which is heated when the cord of the Portable Surf Shower is plugged into a car cigarette lighter or mobile phone charger.

The Portable Surf Shower was originally designed for surfers so that they could have a quick wash before going home or to work after surfing at the beach. Nowadays there are fewer showers available at beaches because of water restrictions so there is a need for an alternative.

While initially designed for Australia's surf culture, this idea also addresses the needs of campers and bushwalkers and, most importantly, deals with ecological issues.



- a. What is the purpose of this product?

1 mark

- b. List **two** clients or users for this product.

2 marks

- c. Ergonomics (human factors), especially size and weight, were important in designing the Portable Surf Shower.

Explain why size and weight were important in the design.

2 marks

- d. Functional factors, as well as ergonomics, were also important in the design of the Portable Surf Shower.

Give one functional factor (excluding ergonomics) the designer needed to consider and explain the relevance of this factor in producing a quality product.

3 marks

- e. Explain how the Portable Surf Shower addresses environmental concerns.

2 marks

- f. What is the difference between responding to a consumer demand and creating a consumer demand?

Use the example of the Portable Surf Shower in your answer.

3 marks

- g. The Portable Surf Shower will be marketed to very specific groups of potential users.

Suggest one marketing strategy to attract one of the groups of users you mentioned in **part b**.

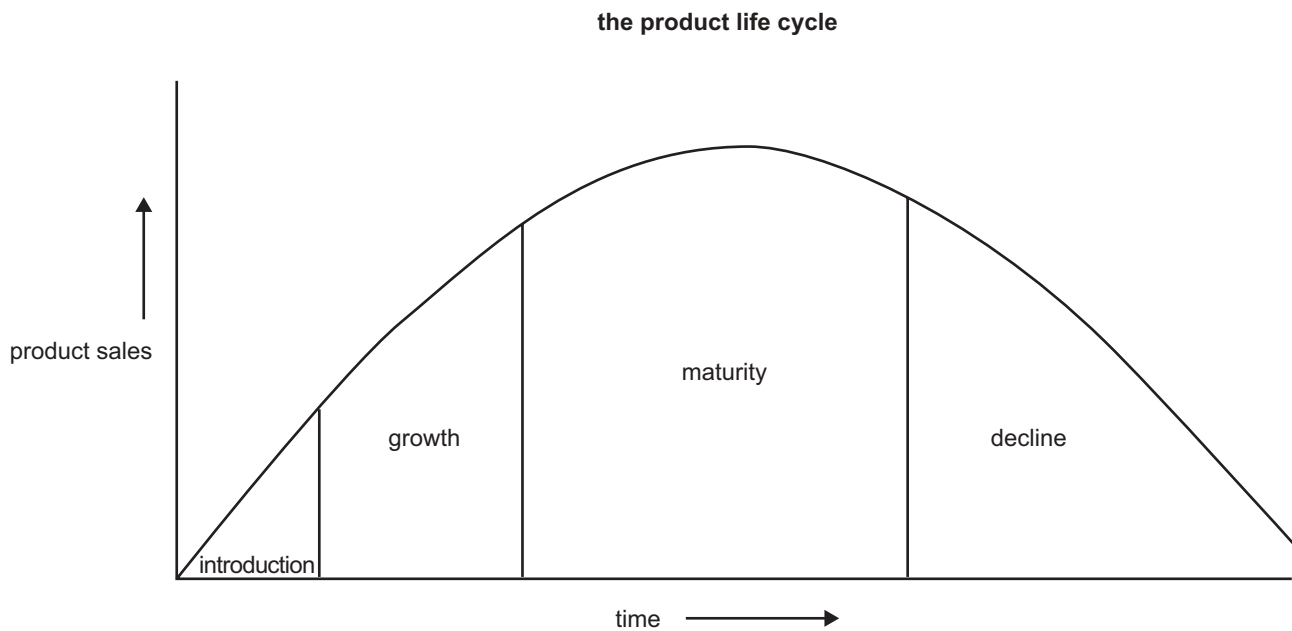
Justify this strategy.

(1 + 2) = 3 marks

- h.** Pricing is important if the product is to sell well.

What factors need to be considered by the company when deciding on the best price for the product?

2 marks



- i.** Marketing will change according to the stage of the product life cycle.

Compare the aims of marketing during the **introduction** stage to those of the **maturity** stage.

4 marks

Total 22 marks

Question 3

A company has developed a new coffee machine.

The company has tried to make sure the processes used to develop and manufacture the coffee machine take into account environmental concerns.

Below is a life cycle analysis (LCA) of the coffee machine. Column 1 shows each stage of the LCA.

Column 2 lists the actions taken to ensure each stage is 'environmentally friendly'.

Column 1	Column 2
Stage of LCA	Actions taken to ensure coffee machine is environmentally friendly
Choice of material type	Use minimal material to reduce weight Use 100% recyclable materials
Manufacture	Minimise material wastage by using good quality management strategies Avoid mixing materials so that they are easily recycled Reduce the time in production by ensuring efficiency of production – therefore using less power
Product packaging and transport	Use reusable or recyclable packaging Reduce weight through appropriate packaging Choose efficient transport – bulk transport, trains and so on
Product use	Insulate coffee machine to keep water warmer for a longer time – therefore using less energy
Product disposal	Design the coffee machine so that it can be disassembled and recycled Minimise the number of separate components Avoid use of glues, metal clamps and screws so that disassembly is easier Locate non-recyclable parts in one area so that they can be easily removed and discarded

- a. List **two** environmental problems that the company producing the coffee machine has tried to overcome.

2 marks

- b. Explain how one of these environmental problems is being solved.

2 marks

- c. Why is it important for the company to consider the disposal of the product when choosing materials for the product?

3 marks

Total 7 marks

END OF SECTION A

SECTION B**Instructions for Section B**

Read the Design Brief Insert. Select one product that you intend to design and answer the following questions.

Name the product you intend to design.

You must select one image as inspiration for your design.

Identify the image you have selected.

(A – D)

Question 4

Identify one important specification (consideration or constraint) from the design brief. Your answer should **not** include cost or time.

a. i. Justify why you consider this specification to be important.

ii. Using the specification you have identified above, write one evaluation criterion as a question.

iii. How will you check that your product meets this criterion?

2 + 1 + 2 = 5 marks

b. i. List **two** tasks you need to carry out in your role as the **designer**.

ii. You decide to produce a prototype/working model/calico toile to show your client. Explain why you decide to do this.

2 + 3 = 5 marks

Total 10 marks

SECTION B – continued

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Question 5**The design option**

Draw and annotate your design in the space below.

- | | |
|--|---------|
| i. Use of image for inspiration | 3 marks |
| ii. Annotation of design specifications | 3 marks |
| iii. Clarity and detail of drawing | 3 marks |
| iv. Function/suitability for intended use | 3 marks |
| v. Innovation and creativity | 3 marks |

Total 15 marks

Question 6

- a. Referring to your design option, illustrate and briefly describe one complex process you will use in making your product.

Illustration	Description

(1 + 2) = 3 marks

- b. Justify your reason for using this complex process.

3 marks

- c. i. Give the specific name of **two** materials you have used in your design.

1. _____

2. _____

- ii. Describe the characteristics/properties of the specific materials you have listed above (excluding colour) and explain why they are suitable for your design.

	Material characteristics/properties	Suitability for design
Specific material 1		
Specific material 2		

2 + 4 = 6 marks

Total 12 marks

Question 7

- a. i.** Your design has impressed a leading manufacturer. The manufacturer is thinking of mass producing your product.

What is the value of doing further research and development before going into production?

- ii.** After a full-size sample/model has been made, market research is conducted.

Explain how market research could be useful to the manufacturer.

- iii.** What are some of the advantages (excluding cost) to the manufacturer of mass producing your product?

2 + 2 + 2 = 6 marks

- b. i.** Poor quality management can greatly affect a company.

List **two** possible effects of poor quality management on a company.

- ii.** Why is it important to consider the cost of poor quality management?

2 + 2 = 4 marks

Total 10 marks

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

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

A

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Your task is to design a product for the opening night of the festival for the Victorian Architectural Institute.

Design Brief Architectural Festival Opening

The Victorian Architectural Institute is holding a festival that will last for six weeks.

The theme of the festival is landmark architecture. The opening night and awards ceremony will be held in a prominent building on 10 January.

B

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Designers have been asked to submit design options for a variety of products that are required for the opening night. The convenors wish the products to have an individual feel and innovative quality about them; something that will make a statement as well as being functional.

C

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The convenors of the festival have provided four images of Melbourne architecture and have requested that the products reflect **one** of these images. The images (**A–D**) are shown on this page.

The products required are

- reception desk*
- freestanding lamp
- opening-night outfit

The products are required one week before the opening.

D

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* a desk where guests collect information and register for the festival

Reception desk

- height must be 720 mm
- must have one drawer for pens, paper
- must have a lockable section for valuables such as laptop computers
- must have at least two different materials incorporated into the design (these can be from the same material category or two different material categories)
- must be inspired by one of the images
- must include at least one complex process

Freestanding lamp

- height must be no more than 1800 mm
- must be able to hold at least two light globes
- must be freestanding
- must have at least two different materials incorporated into the design (these can be from the same material category or two different material categories)
- must be inspired by one of the images
- must include at least one complex process

Opening-night outfit

- must suit a person 1.8 m tall
- must conceal a heavy waistline/pear-shaped body
- colours must suit a male or female with dark brown hair
- must have at least two different materials incorporated into the design (these can be from the same material category or two different material categories)
- must be inspired by one of the images
- must include at least one complex process

END OF DESIGN BRIEF INSERT