Victorian Certificate of Education 
2001

DESIGN AND TECHNOLOGY

Written examination

Friday 9 November 2001
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

<table>
<thead>
<tr>
<th>Section</th>
<th>Number of questions</th>
<th>Number of questions to be answered</th>
<th>Number of marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>2</td>
<td>43</td>
</tr>
<tr>
<td>B</td>
<td>6</td>
<td>6</td>
<td>57</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Materials
• Question and answer book of 22 pages with a detachable Design Brief insert in the centrefold.
• Coloured pencils, markers, a shape template and a human figure template (fibres/yarn fabrics students).

Instructions
• Detach the Design Brief insert from the centre of this book during reading time.
• Write your student number in the space provided on this book.
• 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.
SECTION A

Instructions for Section A
For Question 1, select one material area and answer all questions relating to that area. For Question 2 answer all questions.

Question 1
A scenario has been developed for each of the materials that can be studied. Choose one of these scenarios and answer the questions.

Fibres/yarn fabrics
A friend has asked you to make summer nightwear for her eight-year-old child. They live in Melbourne and their house temperature remains comfortable for most of the year. The child is fashion conscious and the mother wants an easy-care garment.
Use your knowledge of the properties and characteristics of materials to answer the following.
a. Name a suitable type of fabric for the summer nightwear.  

b. Name two relevant properties of this material that make it suitable for the nightwear. Justify both properties.
   i. Justification

   Justification

   Justification

   Justification

   Justification

   ii. Justification

   Justification

   Justification

   Justification

3 marks
c. A few months later the nightwear has become the favourite bedtime clothing, but the child has had a growth spurt and the nightwear has to be lengthened. Describe four steps you would take to lengthen the garment.

2 marks
Total 7 marks
Metal

You have been asked to choose decorative lacework panels for a front veranda. Use your knowledge of the properties of materials to answer the following.

a. Name a suitable type of metal for the decorative panels.

b. Name two **relevant** properties of the material that make it suitable for the decorative panels. Justify both properties.
   
i. ______________________________________________________________________
   
   Justification ______________________________________________________________________
   
   ______________________________________________________________________
   
   ______________________________________________________________________
   
   ______________________________________________________________________
   
   ii. ______________________________________________________________________
   
   Justification ______________________________________________________________________
   
   ______________________________________________________________________
   
   ______________________________________________________________________
   
   ______________________________________________________________________

 4 marks

b. When installing the panel you break a section. Describe four steps you would take to repair the broken panel.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

 2 marks
Total 7 marks

SECTION A – Question 1 – continued
Wood

You are to make a wooden letterbox for a house on a new housing estate.
Use your knowledge of the properties and characteristics of materials to answer the following.

a. Name a suitable material for the letterbox.

b. Name two relevant properties of the material that make it suitable for the letterbox. Justify both properties.
   i. _____________________________
      Justification _____________________________

   ii. _____________________________
      Justification _____________________________

   4 marks

c. After twelve months the surface of the letterbox has deteriorated from the effects of the weather. Describe four steps you would take to apply a protective surface to the letterbox.

   _____________________________

   _____________________________

   _____________________________

   _____________________________

   2 marks

Total 7 marks
Industrial ceramics

A council wants to install bench seats in a popular park. The seats are to be finished with a surface which will be easily maintained and will minimise damage from graffiti.

Use your knowledge of the properties of materials to answer the following.

a. Name a suitable ceramic material for the seats.

b. Name two relevant properties of the material that make it suitable for the bench seats. Justify both properties.
   
i. ____________________________
   
   Justification ____________________________

   ____________________________
   
   ____________________________

   ____________________________
   
   ii. ____________________________
   
   Justification ____________________________

   ____________________________
   
   ____________________________

   ____________________________

   4 marks

c. Unfortunately a corner of one of the seats has become chipped. Describe four steps you would take to repair the seat.

   ____________________________
   
   ____________________________

   ____________________________

   ____________________________

   ____________________________

   2 marks

Total 7 marks
Plastic

You want to make a plastic lamp base in a bright, shiny colour to match your bedroom. It needs to be about 300 mm high and support a simple lampshade. Use your knowledge of the properties of materials to answer the following.

a. Name a suitable material for the lamp base.

_________________________________________________________________________

1 mark

b. Name two relevant properties of the material that make it suitable for the lamp base. Justify both properties.

i. ______________________________________________________

Justification ___________________________________________

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

ii. __________________________________________________________________

Justification ________________________________________________________

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

4 marks

c. After constant use the area on the lamp base near the switch has lost its shine. Describe four steps you would take to return the shine to the lamp base.

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

2 marks

Total 7 marks
Question 2

Marketing

Companies can achieve effective marketing by concentrating their marketing strategies on ‘product, package, price, promotion and place’.

The market mix combines product, package, price, promotion and place to successfully market a product.

Your client is promoting a pet’s water bowl in the magazine advertisement.

Read the advertisement on the back of the Design Brief insert and answer the following questions.

a. Which particular magazine readers would be the potential customers or target market for the pet’s water bowl?

b. i. Product – Name three product features that you would focus on when marketing the pet’s water bowl.

ii. Packaging – Name two features to use in the packaging of the pet’s water bowl to enhance its ‘market appeal’.

iii. Price – List the information the company needs to establish the selling price of the pet’s water bowl.
iv. **Promotion** – Name and justify **two** other ways of promoting the pet’s water bowl to reach the target market.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

v. **Place** – Name **two** places where the pet’s water bowl could be sold.

________________________________________________________________________
________________________________________________________________________

3 + 2 + 3 + 4 + 2 = 14 marks
A product’s life cycle has four phases (introduction, growth, maturity and decline). Each phase represents the volume of sales over the product’s lifetime.

**Product life cycle graph of the pet’s water bowl**

- **c. i.** At what stage of the product’s life cycle did the volume of sales peak?

- **c. ii.** List **two** possible causes for the peak in sales.

- **c. iii.** Name **two** other products that might be in competition with the pet’s water bowl.
iv. Briefly explain two advantages the pet’s water bowl has over its competitors.

Advantage 1

Advantage 2

v. Briefly explain two disadvantages of the pet’s water bowl.

Disadvantage 1

Disadvantage 2

1 + 2 + 2 + 2 + 2 = 9 marks

d. Explain the connection between the market mix and the product life cycle of any product.
e. List three reasons for the decline of sales of any product.

i. 

ii. 

iii. 

3 marks

f. Discuss how the decline stage of any product’s life cycle could be delayed.

4 marks

Total 36 marks
SECTION B

Instructions for Section B

Select one of the design briefs provided in the Design Brief insert. Four of the design briefs have an allocated (designated) materials area. There is a general design brief which any student may choose as an alternative. Students may select any material or combination of materials for this general design brief. Answer all questions for only one design brief. Click here for Design Brief

Selected design material/s ______________________________________

Selected product _____________________________________________

If you have chosen the general design brief, please select whether the recipient is male or female and what their interests or hobbies are.

Gender ____________________________

Special interests and hobbies (that you choose)

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________
Question 3
After you read the design brief, select the four most important specifications. They may be either considerations and/or constraints that you will need to address when designing your product.

The four specifications must relate to the following areas.

   i.  the function and performance of the product
   ii. the selection of materials
   iii. the construction of the product/the complex processes used
   iv.  the size or measurements of the product

   i.  Specification relating to the function and performance of the product

   ii. Specification relating to the selection of materials

   iii. Specification relating to the construction of the product/the complex processes used

   iv.  Specification relating to the size or measurements of the product

4 marks
Question 4
Develop criteria for evaluation based on the specifications that you have listed in Question 3. The criteria could be used by the client to evaluate the end product. The evaluation criteria are to be written as questions. Justify the relevance of each criterion.

i. The function and performance of the product

______________________________

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______________________________

Justification

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ii. The selection of materials

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______________________________

Justification

______________________________

______________________________

______________________________

iii. The construction of the product/the complex processes used

______________________________

______________________________

______________________________

Justification

______________________________

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______________________________
iv. The size or measurements of the product

Justification

3 \times 4 = 12 \text{ marks}
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Question 5
You are to develop one annotated design option that addresses your selected design problem. The option is to be innovative, imaginative and exciting.
Your design must include
• annotations to show how it meets the criteria
• all relevant measurements
• all production processes that would be used to make the product
• all intended materials
• all finishes
• how the function or performance of the product is met
• any other details that will enable the client to visualise clearly all the details of the finished design.
ANNOTATED DESIGN OPTION
Question 6

a. Refer to the question you formulated in Question 4i. Explain how your design option specifically answers your evaluation question about the function and performance of the product.

                                                               
                                                               
                                                               
                                                               
                                                               
                                                               
                                                               
                                                               
                                                               
                                                               
                                                               3 marks

b. Explain how your design option would meet your criteria for the evaluation question relating to the selection of materials that you formulated in Question 4ii.

                                                               
                                                               
                                                               
                                                               
                                                               
                                                               
                                                               
                                                               
                                                               
                                                               
                                                               3 marks

Total 6 marks
Question 7
You want to mass-produce the product designed in Question 5. List four factors you may need to address before you begin production. Explain why you have identified each.

i. ________________________________________
Explanation

ii. ________________________________________
Explanation

iii. ________________________________________
Explanation

iv. ________________________________________
Explanation

3 \times 4 = 12 \text{ marks}
Question 8

a. Your client has decided to mass-produce the product you designed. Briefly explain one modification to your design that would make mass production more feasible.

__________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________

1 mark

b. Explain the implications of this modification.

__________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________

2 marks

c. In developing a production plan for the mass production you plan quality checkpoints to ensure a quality finished product.

i. Name a point at which a quality check would occur.

__________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________

ii. Explain what is being checked.

__________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________

iii. Explain why this check is needed.

__________________________________________________________________________________________________________________________

1 + 2 + 2 = 5 marks

Total 8 marks
Refer to this advertisement when answering Question 2.

Design Brief Insert

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

Your client is a shire council. It has developed an old brickwork site into a park with tourist facilities. The brickworks were famous in the early part of this century for unique handmade bricks and terracotta pipes. Your brief is to design a rubbish bin for the park.

The bin must:
• be able to be fitted with two removable solid inner plastic liners, which will be 900 mm high and 600 mm deep
• be designed with two separate compartments, one for food scraps and the other for recyclable rubbish
• have a clear design of purpose (it must be obvious that it is a container for rubbish)
• be weatherproof
• be fitted with a good water draining system so rain water can easily escape
• be animal proof — with a fitted lid, which facilitates rubbish collection but prevents wildlife getting into the bin at night. Any suitable material can be incorporated in making the lid
• reflect the heritage of the old site with the brickwork

Your design must show that three complex processes will be used in the production of the product.

DESIGN BRIEFS

Your client is an interior design company. They have requested a slim and elegant room divider for an apartment. The apartment has an open-plan design to create spaciousness so the purpose of the divider is to separate the kitchen and the dining room. It should be modifiable so sections can be disconnected and placed independently around the room if desired. It is crucial that the divider is well made and at the cutting edge of design as the apartments are to attract prospective purchasers. The colours used throughout the apartment are soft earth colours and the kitchen appliances are stainless steel. The divider will be visible from both kitchen and dining room.

The client has requested the divider must include these special features:
• overall dimensions, when all the modules are connected, are to be 1500 mm high x 2000 mm wide x 300 mm deep
• reasonably lightweight modules so they can be easily moved
• small drawers for items such as stationery and pens
• see-through spaces so that the room is not darkened when it is used as a divider
• cupboards with decorative doors
• castors that allow for easy cleaning

Your design must show that three complex processes will be used in the production of the product.

DESIGN BRIEFS

Your older sister is going overseas for a summer backpacker's tour of Europe. Since she will be visiting relatives and eating out in restaurants during her trip she will require some suitable clothes for these occasions. Her wardrobe will mainly consist of tee shirts and jeans so she has asked you to design a range of four mix-and-match garments.

• The clothing must be suitable to wear out to restaurants which have a strict dress code where jeans and tee shirts are not acceptable.
• The elegant clothes must be suitable to be worn to restaurants which have a strict dress code where jeans and tee shirts are not acceptable.
• She particularly wants the garments to create a distinctive look, so by mixing and matching she will have a wide range of styles to create the Fusion that she has an extensive wardrobe.

Your design must show that three complex processes will be used in the production of the product of the garments.