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STUDENT NUMBER

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Figures										
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VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY



**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

<i>Section</i>	<i>Number of questions</i>	<i>Number of questions to be answered</i>	<i>Number of marks</i>
A	2	2	43
B	6	6	57
			Total 100

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.

_____ 1 mark

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

i. _____

Justification _____

ii. _____

Justification _____

4 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.

_____ 1 mark

- 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

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

2 marks

Total 7 marks

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.

_____ 1 mark

- 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.

_____ 1 mark

- 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?

2 marks

- 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.

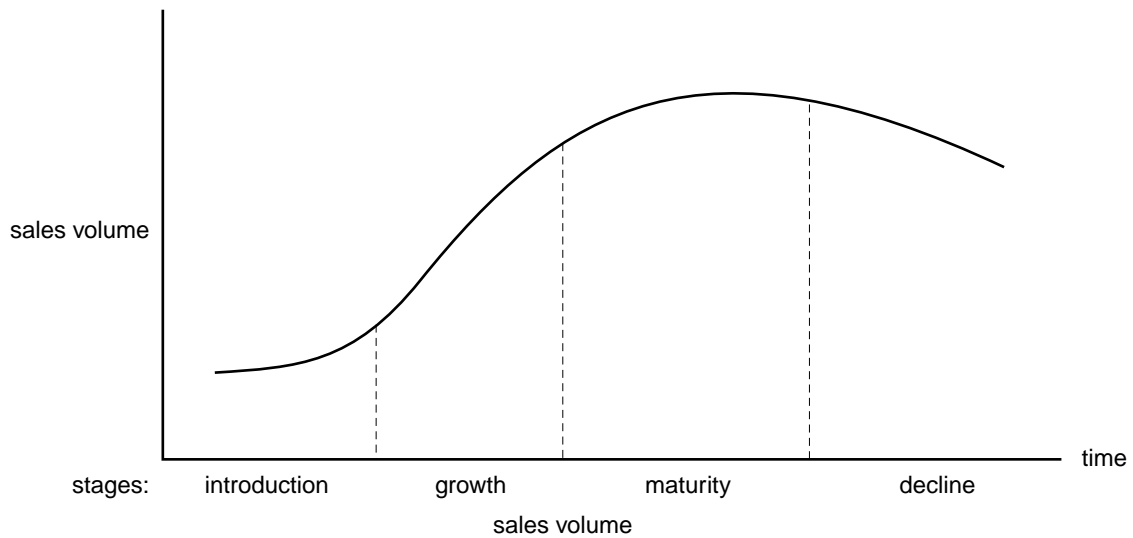
- v. Place** – Name **two** places where the pet’s water bowl could be sold.

3 + 2 + 3 + 4 + 2 = 14 marks

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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?

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

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.

4 marks

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.

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)

CONTINUED OVER PAGE

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

Justification

- ii.** The selection of materials

Justification

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

Justification

iv. The size or measurements of the product

Justification

3 × 4 = 12 marks

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**SECTION B – continued
TURN OVER**

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 × 4 = 12 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.

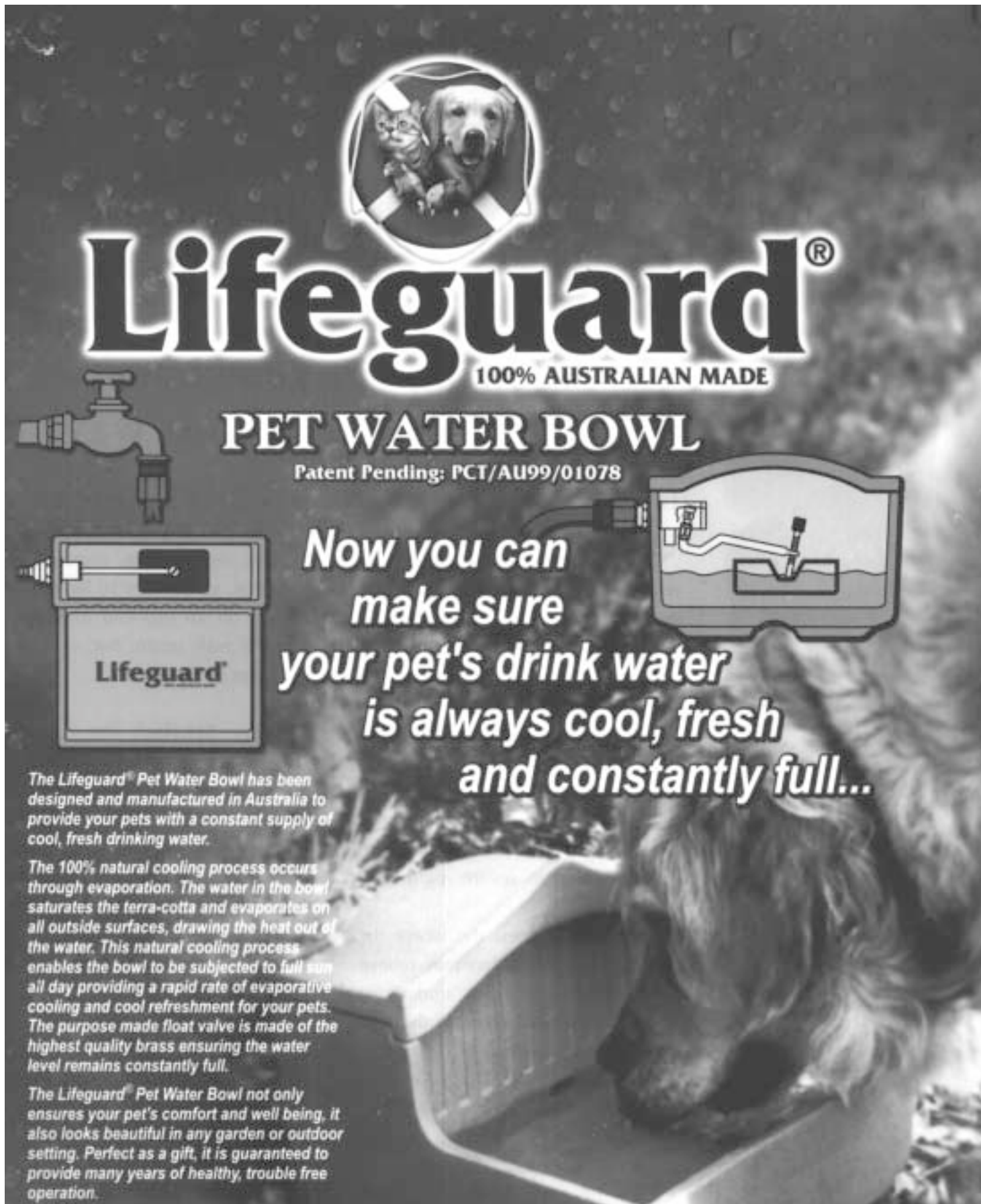
- ii. Explain what is being checked.

- iii. Explain why this check is needed.

1 + 2 + 2 = 5 marks

Total 8 marks

Refer to this advertisement when answering Question 2.



The advertisement features a background image of a dog drinking from a white Lifeguard Pet Water Bowl. At the top center, a circular inset shows a dog and a cat. The brand name 'Lifeguard' is prominently displayed in a large, bold, serif font, with '100% AUSTRALIAN MADE' written in a smaller font below it. Underneath, the words 'PET WATER BOWL' are written in a bold, sans-serif font, followed by 'Patent Pending: PCT/AU99/01078'. To the left, there is a diagram of a tap with a hose and a separate view of the Lifeguard Pet Water Bowl. To the right, a cutaway diagram shows the internal float valve mechanism. The central text reads: 'Now you can make sure your pet's drink water is always cool, fresh and constantly full...'. At the bottom left, there are three paragraphs of descriptive text.

Lifeguard[®]

100% AUSTRALIAN MADE

PET WATER BOWL

Patent Pending: PCT/AU99/01078

Now you can make sure your pet's drink water is always cool, fresh and constantly full...

The Lifeguard[®] Pet Water Bowl has been designed and manufactured in Australia to provide your pets with a constant supply of cool, fresh drinking water.

The 100% natural cooling process occurs through evaporation. The water in the bowl saturates the terra-cotta and evaporates on all outside surfaces, drawing the heat out of the water. This natural cooling process enables the bowl to be subjected to full sun all day providing a rapid rate of evaporative cooling and cool refreshment for your pets. The purpose made float valve is made of the highest quality brass ensuring the water level remains constantly full.

The Lifeguard[®] Pet Water Bowl not only ensures your pet's comfort and well being, it also looks beautiful in any garden or outdoor setting. Perfect as a gift, it is guaranteed to provide many years of healthy, trouble free operation.

Design Brief Insert

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



DESIGN AREA: GENERAL

Members of an extended family have decided to start a tradition. Prior to their children reaching their 18th birthdays, the parents will commission a unique gift to be made and presented to each child. You have been asked to create the first of these gifts and have been given the following guidelines.

The gift must

- reflect the young adult's
 - i. gender (student's choice)
 - ii. special interests or hobbies (student's choice)
 - iii. star sign (in this case the person is an Aquarius which would indicate a water theme)
- have heirloom qualities (can be passed down with pride from generation to generation)
- be an easily transportable size, no larger than 300 mm by 500 mm as the recipient may move interstate or overseas during their lifetime
- be made of high-quality materials.

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

DESIGN AREA: PLASTICS

You are required to design a lockable, brightly coloured prop container for a hospital clown who needs to be highly organised while moving from ward to ward changing appearance, making noise and generally creating fun and laughter.

The container will have a decorative outer surface. It should provide individual spaces for the following items.

- a tray to hold a pack of cards, balloons, face paints, and a mouth organ
- trick compartment, 300 × 50 × 150 mm
- bottle of water 75 mm diameter by 230 mm high
- 10 brightly coloured crayons each 20 mm diameter by 150 mm long
- make-up items including a wig, a nose, sponges, brushes and make-up.

The container must be

- constructed of plastic
- able to be carried in two different ways
- a bold, visible modern design
- fitted with compartments for the above items
- fitted with commercial latches and hinges.

The clown will need to be able to write on at least one surface of the container.

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

DESIGN AREA: CERAMICS

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 incorporation of bricks and terracotta in your design.

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

DESIGN AREA: WOOD AND/OR METAL

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 modular 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

Draw the whole divider, showing individual modules and attachments.

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

DESIGN AREA: FIBRES/YARN FABRICS

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.

- She intends to take one pair of dressy turquoise shoes.
- The clothing must be drip-dry and noniron for easy-care and packing.
- The elegant clothes must be suitable to wear out 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 illusion that she has an extensive wardrobe.
- She is a perfect size 14 and is 160 cm tall with brown hair. She loves colour and likes to wear up-to-the-minute fashions.

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