



1999 HSC

# Textiles and Design

Notes from the Examination Centre

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Published by  
Board of Studies NSW  
GPO Box 5300  
Sydney NSW 2001  
Australia

Tel: (02) 9367 8111

Fax: (02) 9262 6270

Internet: <http://www.boardofstudies.nsw.edu.au>

May 2000

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ISBN 0 7313 4428 6

200072

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# **1999 Higher School Certificate**

## **Textiles And Design**

### **Notes from the Examination Centre**

#### **Introduction**

In 1999, the candidature for Textiles and Design was 671, of whom 483 candidates presented for the 2/3 Unit (Common) paper and 158 for the 3 Unit paper. Generally candidates this year were well briefed for this examination; again the majority selected Section III in the 2/3 Unit (Common) paper for their fourth question.

#### **2/3 Unit (Common)**

##### **Section I**

The properties and performance questions were the more popular in this section, with Question 4 being the most popular.

##### **Section II**

The culture questions had the largest number of candidates in this section, with Question 5(b) being the most popular. This question required the comparison of contrasting cultures and was presented in a structured format.

The more structured format in the History of the Textile Industry, Question 6(a), was also more popular than the essay type, Question 6(b).

The Australian Textile Industry section had a very small response and the standard of the answers varied considerably.

##### **Section III**

86% of candidates chose their fourth question from this section, the most popular choice being Question 9, relating to a child's summer play clothes outfit. The design questions, 8, 9 and 10 relating to clothing, were more popular than those related to soft furnishings.

#### **3 Unit (Additional)**

Less than one third of the candidates presented for the 3 Unit (Additional) paper. The colour question, 2(a), was the most popular in the Science and Technology Section I. Theatre design, Question 5(a), was also very popular in Section II.

Question 3(a) attracted extremely low numbers, and only one candidate attempted Question 3(b).

Some candidates have difficulty in interpreting questions that contain words with which they are unfamiliar. Candidates should be encouraged to read more widely to improve their use of words.

#### **Marking Criteria**

All questions for Textiles and Design are marked out of 25. In this report, a summary of the points required to achieve a good answer is given for each question, as well as a brief summary of poor responses.

## 2/3 Unit Common

### Section 1 – Science and Technology

#### Question 1 Dyeing and Printing

- (a) Describe the methods of imparting colour in EACH of the following:
- stock dyeing
  - piece dyeing
  - hand screen printing
  - rotary screen printing.
- (b) In industry, which of the above colouration methods would:
- (i) be most costly?
  - (ii) enable manufacturers to respond quickly to consumer demands?
- Justify your choice for each answer given.
- (c) Name and describe THREE colour-fastness tests that a manufacturer could use for quality control.

#### Sample responses

(a) Stock Dyeing – fibre stage

- Dyed at fibre stage in a loose form
- Dye pushed through perforated metal cylinder, this allows for thorough dye penetration.
- Agitation and high temperature needed
- Good dye coverage
- May produce interesting colour effects by the blending of dyed fibres
- Large quantities of fibres can be dyed in one operation by using very fast dyes, resulting in dyed fibres with very good washfastness.
- Method: Conical Pan System
- Woollens are often stock dyed.

Piece Dyeing

- Dyeing of a woven or knitted fabric in the piece
- Level dye is necessary for a solid colour or shade
- Design effects are possible, with different fibres being used in the fabric, eg warp dyed and weft not dyed
- Methods of application:
  - Winch Dyeing – fabric dyed in rope form
  - Jig Dyeing – fabric dyed in open width in a repeated action backs forward through the dye bath and then through pad rollers which force the dye into the fabric and removes excess dye.

### Hand Screen Printing

- Principle – applying a design to the surface of the fabrics required for a short run or unique application.
- Method
  - Design is applied to a flat screen by the use of a photosensitive lacquer or film, the areas of the screen that are open allow the printing paste to be transferred to the fabric.
  - One screen is used for each colour in the design.

### Rotary Screen Printing

- Principle of applying a small repeat design to a fabric surface for long run applications.
- Method
  - This method combines the advantages of roller printing and screen printing. Circular screens are prepared as for normal screen printing. The dye is forced through the rotating screen from the central axil to print the fabric.
  - Most rotary screens printing machines have up to 12 rotary screens, one screen for each colour.

### (b) (i) Hand screen printing

- Labour intensive
- Takes more time
- Requires more floor space
- Limited short runs
- Limited design due to screen
- New screen needed for each design / colour change.

### (ii) Piece Dyeing or Rotary Screen Printing

#### Piece Dyeing

- fabrics already produced, simply have to be dyed on demand
- responds to colour trends when required
- less labour intensive, less costly.

#### Rotary Screen Printing

- less labour intensive
- more economical / less costly
- can be used on relatively short or longer print runs
- produces accurately printed fabrics
- screens can be quickly changed to allow design and pattern changes.
- most common method used in industry.

(c) Washfastness Test

- coloured fabric sandwiched between white nylon and white cotton fabrics.
- washed in standardised washing solution.

Wet fastness

- coloured fabric prepared as above
- placed between glass to enhance contact.

Light fastness

- samples prepared with black cardboard covering half the sample
- samples exposed to tungsten glass for 2 hours
- grey scales used to determine the level of discolouration or bleeding
- crocking – rubbing white fabric against coloured fabric to test for surface.

**Difficulties encountered by candidates**

Some candidates were unable to distinguish the difference between dyeing methods, especially between stock and piece dyeing. Many could not name or identify machinery used in the dyeing process. There was a basic understanding of hand screen printing as a hobby, but many could not relate it to commercial manufacture. Rotary screen printing was given little attention.

**Question 2 Finishing**

*Finishes may be used to provide the following fabric properties:*

- *easy care*
- *altered appearance and handle*
- *dimensional stability*
- *environmental protection*

(a) *Name ONE finish for EACH of the above properties.*

(b) *Select TWO of the finishes that you named in part (a).*

*For EACH finish:*

- describe how the finish is applied;*
- explain how the finish produces the desired result;*
- state TWO examples of textile articles that would benefit from the finish, and justify your choices;*
- describe how you would assess the effectiveness of the finish using scientific tests.*

### Sample responses

(a) The following are some examples of the finishes that were named:

- Easy care, eg permanent press, Superwash, permanent creasing of wool, drip dry, wash 'n' wear, spot & stain, wrinkle resistant.
- Altered appearance and handle, eg singeing, scouring, bleaching, milling, carbonizing, mercerising, starching and weighting, calendaring, ie. embossing, schreinerling, moireing, glazing, crêping, beetling, brushing, raising, napping, shearing, pressing, decatizing, burling and mending, softening, stentering or tentering.
- Dimensional stability, eg crabbing, London-shrinking, heat setting, resin treatments, mercerisation, Superwash wool, sanforising, felting, relaxation shrinkage, crabbing.
- Environmental protection, eg flame retardant, water-repellent, water-proofing, mildew/rot proofing, mothproofing, anti-static, anti-slip.

(b) Sanforising – dimensional stability

- (i) Sanforising is a mechanical finishing technique for producing cotton fabric with less than 1% shrinkage during laundering.

Damp fabric is placed on a taut felt blanket or rubber belt that passes around a feed-in roller. The fabric is forced to stretch at the outside curve of the blanket where it is ironed by an electrically heated metal shoe. The blanket then reverses its direction around a steam-heated drum. At this point the blanket surface is shortened and the fabric adhering to it is forced to conform with the blanket of the compress and is dried.

- (ii) Shrinkage is a problem common to many fabrics. There are two types of shrinkage – relaxation shrinkage (occurs in first wash shrinkage of the actual fabric) and progressive shrinkage (occurs in subsequent washes – shrinkage of the actual fibre). Sanforising is a treatment against relaxation shrinkage. This process allows for the accommodation and shrinkage of the yarns which are held under tension during the fabric manufacturing process by physically forcing the yarns to become pressed more closely together.

- (iii) Cotton skirt

Cotton flannelette pair of pyjamas

These would benefit because the buyer could wash them and wear them, without worry of shrinkage. The garment would remain the same size.

- (iv) Test using a control.

Cut a piece of finished and unfinished fabric (square 20cm x 20cm). Wash both under the same conditions. Measure and compare size of both.

Results - unfinished fabric should be smaller than finished fabric.

### Mercerisation

- (i) Fabric is immersed in a solution of sodium hydroxide (18-25%) under minimum tension. The alkali causes the fibre to swell, resulting in an almost circular cross-section. The yarns are then held under tension, while the sodium hydroxide is rinsed away.



- (ii) The finish achieves the desired result, ie. increased comfort, lustre and greater affinity for dyes because the cotton fibres are smoothed out and the twists unravel so that the shape changes.
- The alkali causes fibre to swell, resulting in an almost circular cross-section.
  - Tension results in the improved properties of increased lustre, strength and affinity for dyes.
- (iii) Cotton shirt  
Cotton summer dress
- These would benefit as they could be made by the wearer and would also give better lustre and greater strength. Desired colours could be obtained with increased dyeing.
- (iv) Effectiveness could be tested by comparing a square of mercerised fabric against a square of unmercerised fabric, comparing sheen and lustre of both and the effects of the fabrics on the skin, by testing the dyefastness, and by comparing the brightness of the two fabrics when the same dyes are used in the same quantities.

### Difficulties encountered by candidates

Many used inappropriate and/or obsolete finishes to match performance, while only general knowledge of the finishing process and its application was shown. The *result* of applying the finish was given instead of *how* the finish actually worked. Many could not justify their choice of ‘article’ in relation to the finish selected, while the scientific test was inappropriate for either the finish or the article identified.

### Question 3 Properties and Performance of Textiles

Consider the following textile applications:

- nonwoven surgical gown
- woven terry-towelling bath robe
- jacquard weave upholstery fabric
- weft-knit cycling shorts.

For **THREE** of the above textile applications:

- (a) describe the stated fabric structure with the aid of diagrams;
- (b) suggest a different fibre or fibre blend suitable for **EACH** application. Give reasons for your choice;
- (c) state **TWO** different functional properties that distinguish **EACH** textile application from the other;
- (d) explain the advantages of using the stated fabric structure and the fibre composition to provide the functional properties identified in part (c).

### Sample responses

- (a) Nonwoven surgical gown
- Chemically bonded (resin, Latex, heat-set)
  - Random laid web.
- Woven terry-towelling bath robe
- Base fabric – woven

- Terry pile loops. Thick pile yarns on separate warp beams under slack tension. When wefts are beaten up, warp yarn buckles into loops.

Jacquard weave upholstery fabric

- Intricate woven design
- Repeat motif
- Large number of warp and weft threads.

Weft-knit cycling shorts

- Interlocking loops, eg single jersey.

(Clear diagrams were required for each fabric structure.)

(b) Nonwoven surgical gown

- Cotton, cotton/polyester, cotton/wool, acetate, nylon, polyester. Anything except elastomeric.

Reasons: economical, absorbent.

Woven terry-towelling bath robe

- Cotton, linen, cotton/polyester (predominantly cotton)

Reasons: absorbent, comfort (feel against skin) easily laundered, economical, quick drying.

Jacquard weave upholstery fabric

- 100% wool, wool/polyester, cotton/polyester, 100% polyester, 100% linen

Durable, lustrous, comfortable, absorbent.

Weft-knit cycling shorts

- Cotton/polyester/elastomer  
cotton/elastomer, lycra  
wool/elastomer, spandex.

Elasticity, close-fit, comfort, ease of movement, safety.

(c) Functional properties and (d) the advantage of using such properties

Nonwoven surgical gown

- Disposable – eliminate contamination
- Absorbent for comfort of surgeon
- Impermeable to blood moisture.

Woven terry-towelling bath robe

- Absorbent – loops give greater surface area for absorbing water
- Warmth – air pockets trapped in loops
- Soft handling – comfort next to skin
- Easily dyed to allow design.

Jacquard weave upholstery fabric

- High yarn count, therefore durable
- Aesthetic qualities, easily dyed, lustre
- Abrasion resistant, prevents pilling.

Weft-knit cycling shorts

- Aesthetic – colour, safety
- Comfort – non-restricting
- Warmth – keep muscles warm, insulation
- Absorbency – absorbs moisture for comfort.

### Difficulties encountered by candidates

Many candidate diagrams were too simple and there was an inability to describe terry-towelling, as well as failure to refer to the basic weave or to show an understanding of the complex nature of jacquard weaving. Many candidates did not associate nonwoven surgical gowns with the fact that they are disposable.

Many did not chose a different fibre for each application, and a number were unable to link the fibre and fabric to their stated functions.

### Question 4 - Properties and Performance of Textiles

*The fabric construction, including yarn and fibre type, often determines the end use of the fabric. This is evident in the following three groups.*

<i>Group A</i>	<i>Group B</i>	<i>Group C</i>
<p><i>Cotton fibre for:</i></p> <ul style="list-style-type: none"> <li>- <i>plain weave business shirt</i></li> <li>- <i>weft-knitted fleecy-lined tracksuit</i></li> </ul>	<p><i>Wool fibre for:</i></p> <ul style="list-style-type: none"> <li>- <i>tufted carpet</i></li> <li>- <i>twill weave worsted suit</i></li> </ul>	<p><i>Polyester fibre for:</i></p> <ul style="list-style-type: none"> <li>- <i>satin weave boxer shorts</i></li> <li>- <i>warp-knitted lingerie</i></li> </ul>

*Select Group A, B or C.*

*For EACH article in the group you have selected:*

- (a) describe the yarn structure;*
- (b) describe the fabric construction (support your description with diagrams);*
- (c) identify the performance criteria;*
- (d) explain how the fibre, yarn and fabric structure contribute to the performance criteria.*

**Sample responses**

GROUP A	Cotton Plain weave business shirt	Cotton Weft-knitted fleecy-lined tracksuit
(a) Yarn structure	<ul style="list-style-type: none"> <li>- carded or combed</li> <li>- medium/high twist</li> <li>- short staple fibres twisted together</li> </ul>	<ul style="list-style-type: none"> <li>- carded</li> <li>- soft/medium twist</li> <li>- short fibres</li> </ul>
(b) Fabric construction and diagram	<ul style="list-style-type: none"> <li>- plain weave – interlacing of 2 sets of yarns (warp and weft) at right angles to each other</li> </ul> <p>(Diagrams must be given)</p> <ul style="list-style-type: none"> <li>- each warp and weft alternately over and under</li> <li>- high count</li> </ul>	<ul style="list-style-type: none"> <li>- interlocking/interlooping</li> <li>- courses and wales ie. stripes</li> <li>- horizontal looping</li> <li>- single yarn going backwards and forwards</li> </ul>
(c) Performance criteria	<ul style="list-style-type: none"> <li>- comfortable</li> <li>- absorbent</li> <li>- crisp, smooth feel</li> <li>- crease resistant</li> <li>- easily laundered</li> <li>- good strength</li> <li>- durability</li> <li>- good conductor of heat</li> </ul>	<ul style="list-style-type: none"> <li>- warmth</li> <li>- stretch</li> <li>- absorbent</li> <li>- easily laundered</li> <li>- doesn't snag easily</li> <li>- comfortable</li> </ul>
(d) Fibre, yarn and fabric performance criteria	<p>Fibre: cotton</p> <ul style="list-style-type: none"> <li>- heat conductor</li> <li>- absorbent</li> <li>- comfortable</li> <li>- easily laundered</li> <li>- durable</li> </ul> <p>Yarn: medium/high twist</p> <ul style="list-style-type: none"> <li>- crisp</li> <li>- smooth</li> <li>- strong</li> <li>- durable</li> </ul>	<p>Fibre: cotton</p> <ul style="list-style-type: none"> <li>- warm</li> <li>- absorbent</li> <li>- easily laundered</li> <li>- comfortable</li> </ul> <p>Yarn: soft/medium twist, short fibres</p> <ul style="list-style-type: none"> <li>- warm</li> <li>- absorbent</li> <li>- easily laundered</li> <li>- comfortable</li> </ul>

GROUP A	Cotton Plain weave business shirt	Cotton Weft-knitted fleecy-lined tracksuit
	Fabric: plain weave - strong, smooth - good conductor - easily laundered	Fabric: weft knot fleecy - warm - stretch - comfortable

GROUP B	Wool tufted carpet	Wool twill weave worsted suit
(a) Yarn structure	- woollen (shorter fibres) - med/high twist - plyed yarn	- tight twist - worsted (longer fibres)
(b) Fabric construction and diagram	- yarns inserted into a primary backing fabric - yarns caught on the other side - cut or loop pile - loops held by adhesive (Diagrams must be given)	- interlacing of yarns right angled to each other - diagonal line effect - half-order of interlacing
(c) Performance criteria	- resilient - sound proof - stain/soil resistant - abrasion resistant - dyeability - static electricity - dimensional stability	- dimensional stability - crease resistant - soils less - smart appearance - dry-cleanable - durable - comfortable – smooth handling
(d) Fibre, yarn and fabric performance criteria	Fibre: wool: - resilient - soil resistant - durable - dyeable - stores static electricity	Fibre: wool: - crease resistant - soils less - dry cleanable

GROUP B	Wool tufted carpet	Wool twill weave worsted suit
	<p>Yarn: Medium/high twist:</p> <ul style="list-style-type: none"> <li>- resilient</li> <li>- plyed</li> <li>- dyeable</li> </ul> <p>Fabric:</p> <ul style="list-style-type: none"> <li>- Loops create resilience and sound-proofing</li> <li>- Backing fabric creates dimensional stability</li> </ul>	<p>Yarn: tight twist worsted:</p> <ul style="list-style-type: none"> <li>- stable</li> <li>- soils less</li> <li>- dry cleanable</li> <li>- durable</li> <li>- smooth to handle</li> </ul> <p>Fabric: twill weave:</p> <ul style="list-style-type: none"> <li>- dimensionally stable</li> <li>- durable</li> <li>- smooth to handle</li> </ul>

GROUP C	Polyester satin weave boxer shorts	Polyester warp-knitted lingerie
(a) Yarn structure	<ul style="list-style-type: none"> <li>- multi-filament</li> <li>- fine</li> <li>- no twist or low twist</li> </ul>	<ul style="list-style-type: none"> <li>- multi-filament</li> <li>- textures</li> <li>- fine</li> <li>- no twist</li> <li>- spun staple</li> </ul>
(b) Fabric construction and diagram	<ul style="list-style-type: none"> <li>- satin weave – weft passes over 4 + warp yarns</li> <li>- warp and weft interlacing</li> <li>- floats</li> <li>- more warp than weft</li> </ul> <p>(Diagrams must be given)</p>	<ul style="list-style-type: none"> <li>- interlooping/interlacing</li> <li>- multiple yarns</li> <li>- vertical structure</li> </ul>
(c) Performance criteria	<ul style="list-style-type: none"> <li>- smooth</li> <li>- good feel/handle</li> <li>- lustrous</li> <li>- soft</li> <li>- fashionable</li> <li>- comfortable</li> <li>- easily laundered</li> <li>- drapes well</li> </ul>	<ul style="list-style-type: none"> <li>- comfortable</li> <li>- lightweight</li> <li>- launders well</li> <li>- easy care</li> <li>- smooth to handle</li> <li>- drapable</li> <li>- anti-static finish</li> </ul>

GROUP C	Polyester satin weave boxer shorts	Polyester warp-knitted lingerie
(d) Fibre, yarn and fabric performance criteria	<p>Fibre: polyester is:</p> <ul style="list-style-type: none"> <li>- smooth</li> <li>- easily laundered</li> <li>- lustrous</li> </ul> <p>Yarn: fine, multifilament, no twist</p> <ul style="list-style-type: none"> <li>- smooth</li> <li>- lustrous</li> <li>- soft</li> <li>- easily laundered</li> </ul>	<p>Fibre: polyester is:</p> <ul style="list-style-type: none"> <li>- lightweight</li> <li>- easy care</li> <li>- smooth to handle</li> </ul> <p>Yarn: fine, multifilament, no twist</p> <ul style="list-style-type: none"> <li>- lightweight</li> <li>- easily laundered</li> <li>- easy care</li> <li>- smooth to handle</li> </ul>
	<p>Fabric: satin weave:</p> <ul style="list-style-type: none"> <li>- good handle</li> <li>- smooth</li> <li>- lustrous</li> <li>- fashionable</li> <li>- easily laundered</li> <li>- drapes well</li> </ul>	<p>Fabric: warp knit:</p> <ul style="list-style-type: none"> <li>- comfortable</li> <li>- easy care</li> <li>- smooth to handle</li> <li>- drapes</li> </ul>

**Difficulties encountered by candidates**

Some candidates were unable to identify a yarn structure, referring only to either the fibre or fabric structure. Many could not select the correct structure for the specific end-use given.

Understanding of the structure of warp-knit and tufted fabric was poor.

Diagrams were not well drawn.

Many candidates could not relate the performance criteria to the specific fibre stated, and some were unable to distinguish clearly between the products given.

## Section II – Textiles and Society

### Question 5 Culture and Textiles

*EITHER*

- (a) *Critically discuss the use of textiles as an art medium for self-expression, identifying social status and communication between people.*

*In your answer, refer to TWO contrasting cultures.*

*OR*

- (b) (i) *Identify TWO contrasting cultures and select a textile item from each.*
- (ii) *Compare and contrast the influences of EACH of the following on the textile items chosen in part (i):*
- *textile production*
  - *geographic location*
  - *social organisation*
  - *religious practices*
  - *resources available*
  - *the degree of technological development.*

### **Sample responses**

- (a) Textile arts are widely used as a form of self-expression, identifying social status and communication between peoples. Two contrasting cultures which do this are Japan and India.

#### Self-Expression

The sari from India and the kimono from Japan are both forms of artwork, when individually produced, as they allow the producers to express through the finished garments their likes, dislikes, beliefs and emotions.

In Japan, many designs are derived from nature, with colours inspired by nature. The kimono is looked upon as a precious heirloom that can be handed down from generation to generation.

Kimonos are seldom worn today except for traditional ceremonies, such as coming-of-age ceremonies which are held every January for those who reach the age of 20 during the previous year. They are also worn at weddings, funerals and other events of a formal nature.

In India, great textile works are created by the women of the family for the dowry of the daughter. Whilst these seem to be primarily for ceremonial purposes, the basis for the creation lies in the self-expression of the women folk, who use the creation of textiles to express themselves in this art. They consider the plain fabric to be the earth, their blank canvas onto which they project their beliefs, values and individual personality. They decorate the fabric with many different methods, including screen printing and block printing and they may embroider a piece with a bird in flight, representing freedom, or screen print an elephant to encourage good fortune.



The art of providing self-created textiles for the dowry is a means of expression, through art, of love and duty towards a family member. The act in itself expresses the creator's goodwill towards the intended receiver. For this reason, creating red saris for their daughters' weddings is meant to bring much happiness to the marriage or the incorporation of small mirrors in the textiles used is meant to protect a child from evil spirits.

### Communication

Textiles can also be used as a medium of communication between people. In India, regional dress can communicate to others a person's origins in India. Muslim women in India, seen wearing a head-to-toe covering burghah, are communicating to strangers the fact that they are married and belong to their husbands who alone may see their face and hair. Indians who belong to an extreme branch of Jainism and wear woven mouth-nose masks, are communicating to others their strong beliefs about equality of life on earth and the fact that they do not wish to harm insects that may otherwise be breathed in.

A woman wearing a cream sari is communicating to others that she is a young bride, whilst a woman wearing a white sari is communicating that she is mourning the loss of her husband.

### Social Status

The Indian sub-continent is populated predominantly by people of two religions, Hinduism and Islam. There are smaller religious cults, such as Jainism, Buddhism and that of the Parsees (Zoroastrianism). Over a period of time the caste system has been watered down, but today it is very obvious and there is a disparity between the classes.

The garments that are worn and the textiles that are employed to make these garments differ greatly in quality, colour, style as worn and in the method of making.

It is possible to tell to which caste people belong by the way in which they wear their garments; none are typical as there are many ways of wearing a sari.

The colours also indicate the marital status and celebration of the wearer, just as white, in most Western societies, indicates purity and black is for widow(er)s.

The quality of the fabric, whether it is machine-woven or hand-loomed, is also indicative of status and affordability. An addition to this is the element of embroidery and decoration, with gold or silver thread and metal discs being used, similar to Western sequins and similar shapes with interlacing prints and dyed fabrics.

Obviously, the more elaborate items of clothing look, the more time and money they take, the more they are considered to signify that the wearer belongs to the upper classes.

### Kimono – Japan

In Japan the kimono is looked upon as a precious heirloom, being handed down from generation to generation.

To most Western eyes, the kimono of Japan represents old Japan, the one steeped in tradition and ritual, ceremony and etiquette, of geishas and tea ceremonies, of Madam Butterfly and sayonara. It is a symbol of cultural uniqueness.

To the Japanese, the kimono is all of that, and much more. It may be a symbol but it is also a system of signs which can be read by the community, like a language.

It is possible to read the wearer's marital status, age, social standing, personal view of the specific occasion, its importance or not to their lives, as well as their political philosophy and attitude.

Size of sleeve, shape of collar, colour of pattern, type of pattern, kind of crest, thickness of hem - this is the dictionary of signs, woven together with threads of silver and gold, into long lengths of silk and the result is a life story, not just of one human, but of a whole system of belief.

With every kimono there is always an association with the wearer; it is believed that the soul of the wearer resides in the kimono she wears.

Kimonos are seldom worn today, except for special, traditional ceremonies, such as coming-of-age, which is held every January for those who have reached the age of 20 during the previous year. It is also worn at weddings, funerals and other events of a formal nature.

The decoration of the kimono communicates different things to people, eg various symbols used in Japanese culture mean different things.

Folding fan	-	good luck
Crane or bird	-	happiness
Pine, bamboo, naked branches	-	love and happiness
Tortoise	-	longevity

The Obi and the way it is tied indicate, for example, a woman's status, eg a married woman has a flat knot tied across the back, whereas a young person wears hers tied 'butterfly' fashion.

Colour is of great importance, particularly in respect of age. This colour-sense is even carried over into the realm of Western dress. Bright colours are reserved for children and clothing colours become more subdued with age.

Married women, on very formal occasions, wear a black tomisodi made of silk crepe with the family crest on it in five places. This is completely black – even the Obi. A coloured tomisodi is less formal, with designs on the shoulders.

### **Difficulties encountered by candidates**

Many candidates misinterpreted the question, not recognising or giving examples of textiles as an art medium. Communication was seen to be the way in which people talk to each and learn about technologies.

Some candidates wrote all they knew about a specific culture but it did not relate to the question asked.

Some examples were given, but these were not discussed critically as the question required.

- (b) (i) 1 Scotland - kilt  
2 Indonesia-Ikat (sarong)

- (ii) Textile production

Kilt - This is based on traditional methods of fabric construction; there has been a high degree of technological development in its manufacture, however, with worsted cloth and woven fabric being used. Design is woven into the fabric, with the yarn and fibre being dyed to achieve the specific tartan representing the family or clan of which the wearer is a member. It consists of high twist yarn in a tightly woven fabric; today the fabric is used for other garments.

The fabric of the kilt is constructed specifically for the design of the garment. The length of the fabric is used to go around the body, with a straight piece in the front, and knife pleats around the rest of the body. The fabric is pleated so as to retain the

complete tartan pattern. Pleats are hand sewn to hip level and the hem is formed by the selvedge. Originally, it was held in place with a belt that is now called the Feileadh Bag or little kilt.

Ikat sarong - In contrast, the Ikat is made from a combed cotton fabric, plain woven. The decoration is a labour-intensive process that demands great skill. This process involves resist-dyeing the yarn; there is a sequence of tying (or wrapping) and dyeing sections of bundled yarn to a predetermined colour scheme prior to weaving. The dye penetrates the exposed sections, while the tied sections remain undyed. The patterns formed on the yarns by this process are then woven into the fabrics, achieving a slightly fuzzy design. Since the sarong is wrapped around the body, no garment construction is required.

#### Geographical location

Kilt - The kilt, which was designed to cope with the cold climate and mountainous terrain of the Highlands of Scotland, was originally confined to the Highlands and developed from this.

It allows for freedom of movement, being made of approximately 7 metres of wool fabric and, when worn with a shawl, provides a very warm outfit. The tight weave dries quickly, does not absorb moisture and, because of the design, can be taken off and used as a blanket.

Ikat - Being worn in a warm climate, Indonesian garments must protect the wearer from the sun but must also be cool to wear. For this reason cotton is used for the sarong since it is a cool fibre to wear when woven into cloth and may be folded in a number of ways.

Indonesia is made up of many different islands. Ikat has developed in only a limited number of areas, although its use has become more widespread as travel and communication have increased. Different designs have developed in different regions.

#### Social organisation

Kilt - Originally the kilt was confined to the Highlands and Lowlanders regarded it as a 'barbarous' form of apparel. With the gaining of Royal approval, the kilt was adopted as a national form of dress. The tartan patterns are used to identify the clan, family or regiment with which the wearer is associated. The first tartans were the result of individual wearer's own designs, with each colour and formation having a significant meaning. These patterns were then slowly adopted to identify individual districts, and then finally clans and families.

Ikat - Indonesia has distinct social classes. Ikat is a very labour-intensive process, the manufacturers being recognised for a high level of skill and craftsmanship. Some types of Ikat are very expensive and so are purchased only by the wealthier classes.

#### Religious practices

Kilt - Today the Scots are predominantly Christians, so the kilt is a modest garment that protects the body. The wearing of the kilt is reserved for formal and ceremonial occasions, such as wedding ceremonies, when a formal kilt with sporran is worn by men.

Ikat - Indonesia is predominantly a Muslim country. The use of people or animals in designs is not allowed, and, as a result, the designs woven into the fabric are mainly geometric.

#### Resources available

Kilt - Due to the climate and geography of Scotland, wool was the most commonly produced fibre and, as a result, kilts are made from wool.

Ikat - The hot climate suits the growing of cotton, which is the fibre predominantly used in the manufacture of Ikat. Indonesia is a densely populated country and so human resources are readily available, allowing the labour-intensive industries to flourish.

#### Degree of technological development

Kilt - Today a high level of technological development is available to produce large quantities of tartan fabric of high quality. Only top quality fibres and the most modern equipment are used to produce both the yarn and the fabric. The dyes used are modern synthetics and the method used highly sophisticated. This was not always so, but today kiltmaking is a big industry. The stitching of the kilt is still done by hand for the true kilt, but the imitation kilt uses less fabric and is machine sewn.

Ikat – Production is still a craftsman-based industry, therefore machinery used is simple. In village factories and larger towns, however, dyehouses, with improved technology allow for larger scale dyeing using chemical dyes.

#### Difficulties encountered by candidates

Many candidates misinterpreted the questions; instead of naming the culture and the relevant item a number gave unnecessary details and sketches.

Social organisation was given as a social activity, but no link was made between geographic location and selected item and little reference was made to how technological development affected the production of the chosen item. Instead of referring to the association between textile production and religious practices, the responses gave general information about the industry and religions from each area, but were unable to compare and contrast their chosen cultures.

#### Question 6 History of the Textile Industry

##### *EITHER*

(a) *During the nineteenth and twentieth centuries the development of the textile industries progressed as a direct result of a number of major inventions in the areas of:*

- *yarn production*
- *fabric production*
- *garment manufacture*
- *colouration.*

*Explain how inventions during the nineteenth and twentieth centuries, in ONE of the areas listed above, have affected the following:*

- (i) *productivity and manufacturing efficiency;*
- (ii) *working conditions;*
- (iii) *quality control.*

##### *OR*

(b) *Select TWO major inventions of the textile industry. Describe ONE invention that occurred before the twentieth century and ONE that occurred this century. Compare and contrast the changes in the technology. Outline the impact these changes had on the availability of textile products then and now.*

### **Sample responses**

(a) Yarn production

(i) Production and manufacturing efficiency

The inventions of the 19th century affecting yarn manufacture included:

The cap spinner (Richard Kay) - which greatly increased the amount of yarn produced without increasing capital costs.

The ring spinner (John Thorpe) further improved the production rates and, with the introduction of the Traveller, the speed further improved. The machines had less down time compared with the Mule of the previous century. The quality of the yarns was good and these machines were suitable for the production of all types of fibres.

The ring spinner, and, to a lesser extent, the cap spinner, have continued to be used in this century but with considerable improvements. The method produces good, strong and relatively smooth yarns, but doffing time keeps speeds down. In the latter part of the 20th century automatic doffing has been introduced; this increases speed and, in turn, reduces the amount of labour required to operate the machines.

By the 1960s the ring spinner was the most used spinning machine for all fibres since it could also handle synthetic and blended yarns as well as the natural fibres. A disadvantage of this machine was the number of preparatory processes required.

By the middle of the 20th century new machines had become available. These machines were more fibre-specific.

The Open-End machine revolutionized the spinning of cotton. The spinning apparatus of the machine is very small, it is an extremely fast method, taking the sliver from the carding machine, thus cutting out many processes as well as producing a large package or cheese of spun yarn suitable to be used on knitting machines, and the gripper loom or to be dyed without having to be transferred onto another package.

An Australian invention, the Self-Twist, did the same for wool spinning. It comes to the machine as a sliver, saving preparatory processes, is high speed, uses small floor space and, like the Open-End machine, needs almost no labour to run. The Selffill is an adaption so that blends of wool can be spun.

(ii) Working conditions

Working conditions at the beginning of the 19th century were very poor, with overcrowding of factories, humid conditions with very little ventilation and with poor light, as well as very long working hours.

As the technology improved, so did the working conditions. Firstly, as machines became more productive, floor space was reduced, but it was not until the mid-20th century that the factory conditions improved radically. One reason was that it was realised that the machines performed better in a dust-and-lint-free area, so now, on ring spinners there is a moving vacuum removing the loose fibres and dirt. Through history machines have always been noisy. The new technology of the 20th century has become less noisy but laws have now been introduced to protect hearing (ear protectors have to be worn in all areas of high noise). Most of the new machines are totally enclosed so that the dangers of the 18th century machinery have been removed.

Working conditions have improved as a result of special laws, but the improved technology has also helped.

- (ii) Quality control
- (iii) As technology has developed, so has the ability to control the quality of the yarn.

Today computer-controlled machines can produce the exact yarn required. Any breakages or faults are registered immediately and can be rectified.

As improvements were made to the ring spinner, a device was fitted to each spinner so that it would stop automatically when the incorrect yarn was being produced when a breakage occurred.

The cleaner environment has also helped to improve the quality of the product.

### **Difficulties encountered by candidates**

Many candidates had trouble in identifying technology from the 19th and 20th centuries.

When machines were named, little reference was made to the production and manufacturing efficiency of these machines. Most candidates could state that production was faster, but there was little justification for this statement.

Few reasons were given for the improved working conditions and many candidates failed to state that there was any quality control. Most merely stated that conditions had improved.

- (b) The following are two major inventions of the Textile Industry

- Spinning Jenny, 1764 by James Hargreaves
- Open-end spinning, 1965 in Czechoslovakia

In 1764 the first spinning machine was invented by James Hargreaves who thought of the idea when he saw on the floor an overturned spinning wheel that continued to revolve. From this Hargreaves developed the Spinning Jenny. It was hand-cranked and turned eight spindles, spinning more yarn than eight spinners could produce with hand-wheels. It could spin only short fibres of which the cotton fibre was best. There was a resulting increase in the amount of yarn which then led to an increase in cloth manufacture.

In the 20th century (1965) the open spinner was developed by the Cotton Research Institute in Czechoslovakia. Fibres are fed into the machine in the form of a sliver by air stream and deposited on the inside of a rotating device. This revolves at very high speed, forcing the fibres into the groove on the outside wall of the drum, where they are then drawn off and twisted to make yarn. This is a very productive method with fewer labour costs and requiring less floor space and fewer energy sources.

The major differences between the new and the old technology are the replacement of the manual operating of the machines and the quantities that are now produced. The 20th century invention produces huge quantities of yarn compared with the Spinning Jenny. Because the Open-end spinner is computer-controlled, there is little room for human error; fibres are very even, and the count can be altered to suit the end-use. Both technologies were designed for the production of cotton, and produce a slightly more hairy yarn than the other methods of spinning of their day. Although the early machinery took up little floor space and required less electricity, production rates were still very small compared with the later high-tech machinery.

The impact of the Spinning Jenny on the availability of products was considerable – there was greater yarn production leading to more fabric production, the yarn quality improved, the yarn became cheaper and allowed more textiles to be available to the people.

The 20th century technology has reduced manufacturing time, including the preparation process as processes in the preparation of the sliver have been eliminated. The production costs have been considerably reduced, less floor space, or energy to run is required, while more variety is possible and very little labour is required.

### **Difficulties encountered by candidates**

Descriptions of the inventions lacked detail, and included little reference to the impact of changes relating to availability of textiles. Many candidates misunderstood the question and discussed social and economic problems rather than technology.

### **Question 7      The Australian Textile Industry**

*EITHER*

- (a) *The existing textile, clothing and footwear (TCF) industries of Australia have managed either to survive the economic pressures of the last twenty years or to create opportunities for themselves in a climate of technological development.*

*Choose FOUR of the following and discuss their importance to the Australian TCF industries. In your answer, make reference to the above statement.*

- *government policy*
- *off-shore manufacture*
- *research and development*
- *new technologies*
- *environmentalists and conservationists*

*OR*

- (b) *Discuss the impact of computer technology on each of the following:*
- (i) *fabric design and manufacture*
  - (ii) *garment design and manufacture*
  - (iii) *textile and garment marketing*
  - (iv) *the textile worker.*

### **Sample responses**

Government policy

Tariffs - tariff walls protect less efficient companies, encouraging complacency.

Reducing tariffs:

- increases competition
- decreases employment with failure of less efficient and non-competitive companies
- The prime response of successful companies is to increase value-adding - decreases cost factors, eg labour, by upgrading through introduction of new technology and finding a niche market through product development, research, development and innovation.
- As companies become more competitive, export potential can be explored.

### Dollar float

Competition against imports (in/out tariffs) is affected significantly by the exchange rate, the lower dollar improves competition, the raised dollar decreases competition, for both local and export markets.

- Financial assistance

This is essentially tax concessions and/or subsidies to enable:

- purchase of new technology
- skills training
- market exploitation
- exports (participant in global economy)

As practised under TCFDA, however, this is viewed mainly as ‘corporate welfare’.

### Off-shore manufacture in Asia-Pacific region

- Lower cost imports, primarily due to lower wages, gives competition against imports.
- As overseas living standards improve, there is potential for overseas exports (value-added) to penetrate the ‘middle class’ market.
- Overseas firms set up manufacturing (100% or joint venture) to:
  - gain better access to local/overseas market
  - gain government dollar subsidy for re-imports, eg OAP gives tariffs only on overseas processing of overseas textiles.

### Research and development

- Today, overseas companies cannot compete in standards. The Australian industry commodity market must develop specialised or niche product ranges.
- There is need for research and development/ innovation in product and process development.

### New technologies

These result in:

- increased automation, hence lower labour costs (textiles are now capital-intensive, but clothing and footwear remain labour-intensive)
- new markets (eg non-woven), or improved products, based on manufacturing and material technology
- new technologies such as information, EPOD, e-commerce, have enhanced supply chain management.

### Environmentalists and conservationists

- cause costs to be added to manufacturing through stricter environmental protection legislation.
- This is often found to improve the dollar, eg reclaimed water gains loans from Water Board.
- Marketing – they help to promote an enviro-friendly company image.



### Difficulties encountered by candidates

Many candidates gave information that was very old or gave details of government policies that existed 20 to 30 years ago. They failed to recognise that tariffs and bounties have all been lifted and that this has changed the face of the Australian textile industry.

Many did not understand the term 'off-shore manufacture', and could not give any information relating to research and development or new technologies.

The information relating to environmentalists and conservationists that was given did not relate to the textile industry.

- (b) Computer technology is used in all areas of the commercial textile and clothing industries, but more so in the textile industry which has become highly capital intensive, while the garment industry has, to a major extent, remained labour intensive.

Computers are now being used at every level.

- (i) Fabric design and manufacture:

- Yarn manufacture – open-end spinner, self-twist, ring spinner now all operated with computer control.
- Weft and Warp knitting - speed, control of yarn to machines and design work are all controlled by computers. Most weft knitting machine pattern work is computer-controlled directly by a Jacquard attachment, to alter the design, colours, or type of yarn.
- Weaving - the Jacquard attachment developed last century was one of the first computer-type operated, with a pinch card system controlling every thread in the loom. Today the card system has been replaced by a conventional computer that can alter design. All looms are fitted with some degree of computer-control.
- All forms of dyeing, printing and finishing have computer-control for timing, temperature and rate of movement.
- Surface decoration such as machine embroidery can be totally computer-controlled, even to the newer domestic sewing machines which are now computer-driven.

- (ii) Garment design and manufacture

Communication through the computerised media has made fashion and fashion ideas a world-wide industry. Fashion can be introduced to Australia at the same time as the models are on the catwalk in Milan or Paris.

Use of computers in garment design are now increasing rapidly. The initial designs can be developed on a computer or images can be scanned in and altered to produce new designs.

Pattern-making, sizing and cutting are now commonly done using computer-control. An example is the Gurber pattern cutter which develops the patterns, produces them and cuts the fabric.

Although sewing machines can be fitted with computers, their use is still limited and the operator is required to be present for most of the production. This is still a very labour-intensive section of the industry.

- (iii) Textile and garment marketing

Packaging and advertising strategies can be planned and produced on computers.

Communication is also an important function of computers, which are used to find markets and use such markets.

Fashion is an international business, so communication via computer helps people stay in touch.

(iv) The textile worker

In any industry where computers are becoming of primary importance, the workers are losing their jobs or being retrained. The textiles industry is proof of this, since the nature of the Australian industry has changed. Instead of being producers of yarns and fabrics, Australians have become designers and prototype makers, but the manufacturing now goes overseas to off-shore manufacturers. This has caused much job loss in these industries. Industries controlled by high tech computers are still surviving, but the jobs of machinists and factory workers are disappearing. Jobs available in the textile industries are mainly for highly skilled scientists, chemists etc.

### Difficulties encountered by candidates

Candidates showed little knowledge of computer-use in the fabric or garment sections of the Australian textile industry and few made reference to any specific examples.

There was some reference to computers in marketing but again no specific examples were given.

Many candidates stated that computers are helpful to the worker as they take over all the dirty jobs. There was no acknowledgment of the fact that computers are causing considerable job loss in this industry.

## Section III - Design

### Question 8

*Australia's natural environment can be an inspiration for fashion designers.*

- (a) *Design a swimming costume that reflects the above statement. Sketch and label front and back views, clearly showing construction design lines, colours and fabrics.*
- (b) *Describe how your design reflects the theme of Australia's natural environment.*
- (c) *Explain the functional requirements of the garment in relation to fabric choice(s) and design features.*
- (d) *Explain in detail ONE major construction technique.*
- (e) *Design a swing tag and care label for your swimming costume.*

- (a) Sketches of swimming costumes were both clear and balanced, silhouetted lines were well defined and all construction lines were drawn and clearly labelled.

Colours were clearly labelled, with the best responses naming the colour schemes, eg monochromatic.

Fabrics were labelled, eg 100% Lycra (fabric), elastomeric (fibre).

Designs creatively linked the design to the inspirational theme 'Australia's natural environment', producing exciting styles.

- (b) There was a clear link between style of swimming costume, colours, patterns, prints and decoration and the Australian natural environment, eg earthy reds/brown of the Outback, patterns/textures of marine life, shapes/colours from native plants such as wattle, gumnuts, gum leaves etc.

The very best candidates gave at least 2 themes inspired by the Australian environment.

- (c) Functional requirements were explained and linked to the end-use of the designed garments in relation to:

Fabric choice - 100% Lycra - quick to dry, excellent elasticity, therefore form-fitting/streamlined, as is needed for a costume.

Design features:

- 'T' style back, allowing free arm movement, for swimming
- sleeves, shorts style in one piece, for protection from the sun's UV-rays.

- (d) Construction technique: choice needs to be a major technique, eg technique involved in attaching elastic. Clear steps should be given, with measurements and illustrations to give full explanation.

- (e) Swing tag - creative logo, with clear information about the garment.

Care tag - separate from swing tag, with information regarding fibre content, the country where garment was made and the care instructions all stated concisely.

### **Difficulties encountered by candidates**

Drawings were hard to follow, many did not use the guides provided at the end of the paper and garments designed showed little creativity and inspiration as asked for in the question. Labelling was poor and no colours were indicated. Fabrics were either not named or were unsuitable for the type of garment.

Instead of referring to the natural environment, many used Australian icons such as the Opera House or made only very general reference, for example, to a blue sky.

Functions were merely listed, with little or no explanation of the specific function of this type of garment.

Construction techniques given were only minor and no details were given.

The swing tag and care tag were combined, with little reference to the correct information required for a care tag.

### **Question 9**

*Design a coordinated summer play outfit for a young child learning to dress himself/herself. The outfit must use at least TWO different fabric structures.*

- (a) *Sketch front and back views of the outfit, identifying the aesthetic features, functional features, fabric structures and colours.*
- (b) *Discuss the design features that make the outfit appropriate for a young child.*
- (c) *Discuss the fibre type(s) and fabric structures to be used in the outfit. Give reasons for your choices.*
- (d) *Describe TWO construction and/or decoration methods that would be appropriate for the fabrics and style chosen.*

- (a) Clear, well defined sketches were given, showing imagination and meeting all the requirements of the question.

Aesthetic and functional features were indicated.

Aesthetic: large bright buttons, pockets, colourful patches with bold colours, appliquéd designs.

Functional: draw-string elastic waist, knee patches for extra strength, buttons for access, pocket for safekeeping of possessions.

The two types of fabric were clearly identified, eg plain twill weave, weft knit.

Colours were clearly indicated.

- (b) Design feature suitable for children's wear were identified and discussed, eg bright colours with appeal for young children, large bright buttons for easy manipulation by little fingers, other fastenings suitable for children could be velcro for easy opening and closing, large plastic zippers that do not catch little fingers, drawstrings for children to learn to tie knots, patches for brightness as well as padding and strength.
- (c) Fibre types – These were suitable and reasons for their choice given, eg polyester/cotton blend, for strength, durability, absorbency, comfort and easy laundering - since children wear out clothes by rubbing, catching them on objects, crawling and climbing, and they need to be frequently washed to remove heavy stains. Clothing needs to be comfortable, otherwise it will not be worn.

Fabric structure - the fabrics chosen must reinforce the properties of the fibres and add more, eg weft knit for tops - elasticity, easy to move in, good resilience and cool to wear:

Twill weave: very strong and durable for shorts, trousers etc.,

Close weave: with good draping qualities and not easily creased.

- (d) Construction techniques could include zippers, button and buttonholes, set in sleeves etc. Decorative techniques could include machine embroidery, dyeing, appliqué, fabric painting. Clear explanations needed to be given.

### **Difficulties encountered by candidates**

Drawings were unclear and out of proportion; again many candidates did not use the guides provided at the end of the paper. Little creativity was shown, with few references to aesthetic and functional aspects of the design. Fabrics and fibres were either inappropriately named or incorrect and many confused the names of the fabrics with those of fibre types.

Poor responses were given to the construction/decorative techniques; those given lacked detail.

### **Question 10**

*From a textile project you have worked on:*

- (a) *state the design brief;*
  - (b) *sketch the textile item, indicating fabric(s), colour(s) and construction technique(s);*
  - (c) *list the functional and aesthetic design features of your project;*
  - (d) *describe how you would change your original idea to target a specific commercial market of your choice;*
  - (e) *describe the assessment techniques that can be employed to evaluate the quality of the modified textile item.*
- (a) Good, clear and concise instructions for the design briefs were given.
  - (b) Sketches were clear, giving all details of design features, while labelling was precise, with information regarding fabric, colours and construction techniques used on the textile project.

- (c) A very detailed list was given, identifying all the functional and aesthetic features of the design, including such points as were relevant, emphasising, for example, why the colour was chosen, whether the fastenings were merely functional or were also aesthetic.
- (d) The target market was identified, and detailed information was given about the changes that would need to be made.
- (e) Assessment techniques such as testing strength, rubbing, etc., as well as surveys and prototypes etc. were clearly described and the results given.

### **Difficulties encountered by candidates**

The design brief was either not given or, in many cases, a statement of what had been made that year, or the design process was given.

Sketches did not include the back and front aspect with all design details, and often the designs lacked instructions for carrying out the project.

Descriptions of fabrics were unclear or incorrect.

There was little labelling of construction techniques, and therefore no apparent understanding of how the product was made.

There was little distinction between functional and aesthetic features, many of which were not stated.

No specific market was stated, sometimes no differentiation was made from the original group and few significant changes were apparent.

Assessment techniques were very vague and often were not stated clearly enough to show any knowledge of the requirements of the question.

### **Question 11**

*You are the designer for a textile company which produces a range of bedlinen and bedroom accessories. You are to design the interior furnishings of the athletes' living quarters within the 2000 Olympic village, using the theme of 'Sydney'.*

- (a) *Sketch a suitable fabric design, indicating the colour scheme and design features.*
- (b) *Show the placement of your design on, and how you can incorporate this fabric design into, a coordinated range that includes:*
  - (i) *a quilt cover;*
  - (ii) *sheeting;*
  - (iii) *curtains.*
- (c) *Sketch and label your range of designs.*
- (d) *Justify the aesthetic features of your designs.*
- (e) *State an appropriate technique for incorporating your design into the fabric that would be suitable for mass production. Justify your choice.*

- (a) Precise, well labelled sketches were given, showing icons of Sydney, eg the Harbour Bridge, the Opera House, the Sydney Olympic logo etc.

All design features and colours were clearly labelled.

- (b) The quilt cover, sheets and curtains were clearly drawn and a suitable placement of fabric designs made, ie the quilt had total placement, for the sheets the designs were on the top

turned-over edge and, on the curtains, in a position that suited the size and drape of the curtains.

The techniques of incorporating the design also suited the article, eg machine quilting with screen printing for the design sketched in part (a). The sheeting design was also screen printed but had a simple machined edge to coordinate with the quilt. For the curtains the design was screen printed with similar stitching for hems and top casings.

The theme of the colours was carried to all articles.

- (c) Good clear labels were given, with all labelling showing colours, techniques involved in incorporating the design and the necessary construction lines involved in making the articles.
- (d) Aesthetic features included the icon/theme, described colours and explained why they were chosen, including how they were representative of the theme. Many chose to include the Olympic symbols. Reference was also made to the use of the elements and principles of design to achieve the best results for reinforcing the theme.
- (e) The most appropriate technique for incorporating the design into the fabric was given - usually roller or screen printing. Good reasons for the choice were given, such as; 'The following method was quick, and cost effective for the quantities to be produced'. If the same fabric were used for all three items, these same methods could be used for all.

### **Difficulties encountered by candidates**

Many of the fabric designs did not relate to Sydney, and often only one colour was given, with no mention of 'colour schemes'.

The labelling gave little idea of the design features.

Many did not show the placement of the fabric design on the article, or just gave its placement on one article. They failed to say how the design was placed on the fabric, and did not give techniques of incorporation.

Many did not attempt part (c), and others failed to label fully, not stating colours and design features.

Most referred to the colour as being an aesthetic feature, but did not give any others.

A number of candidates did not give suitable techniques for mass production, referring to hand embroidery or appliqué and there was little justification for their choice.

### 3 Unit (Additional)

#### Section I – Science and Technology

##### Question 1 Fibre Structure

*EITHER*

- (a) *To fully appreciate the properties of fibres, a thorough knowledge of their molecular and morphological structures is required.*
- (i) *Describe the methods used to investigate the molecular and morphological structures of fibres.*
  - (ii) *Compare and contrast the differences in the morphological and molecular structures of ONE natural, ONE regenerated and ONE synthetic fibre.*
  - (iii) *Select an appropriate textile end use for EACH of the fibres discussed in part (ii). Justify your choices.*

*OR*

- (b) *The morphological and molecular structures of fibres influence their properties.*
- (i) *Explain in detail how molecular structure can influence the properties of wool and silk fibres.*
  - (ii) *Compare the morphological structure of flax and wool fibres. Outline the effect of the structure on each fibre's properties.*
  - (iii) *Describe the molecular and morphological changes that result from the mercerisation of cotton fibres.*

- (a) (i) The molecular structure of fibres refers to the molecular arrangement of atoms using a variety of bonds. These include covalent, hydrogen and van der Waals forces. The molecular structure is investigated by using powerful electronic microscopes and x-ray diffraction in order to determine the nature of the bonding.
- The morphological structures of the fibre can be determined by using an optical electron microscope. The morphology refers to the cross-section and longitudinal sections of fibres. This also refers to the microstructure. The electron microscope enables this finer structure, which incorporates the primary and secondary wall, fibrils etc, to be viewed.

One natural fibre – Cotton	One regenerated fibre – Viscose	One synthetic fibre – Nylon
<p>Morphological – kidney shaped cross-section, lumen, layers of secondary wall and primary wall. Fibrils and outer cuticle.</p> <p>Molecular:</p> <p>Microfibrils are parallel</p> <p>Fibrils – more amorphous</p> <p>H-bonds – cellulose, crystalline system</p> <p>Covalent bonds</p> <p>Some weak van der Waals forces.</p>	<p>Morphological – star shaped cross-section.</p> <p>Molecular:</p> <p>Polymers shorter than cotton. No fibrils, weaker molecular, fewer H-bonds than cotton, more amorphous areas than cotton, weaker wet strength, stretching during manufacture, more orientation</p> <p>Crystalline skin, amorphous core</p> <p>Some treated rayons from covalent cross-links to give strength</p> <p>Predominantly H-bonds due to amorphous regions</p> <p>Disruption due to hydrolization</p>	<p>Morphological – polyimide variety of melt-spun cross sections varies depending on type and adds delustre ..... during drawing of great crystalline structure.</p> <p>Molecular:</p> <p>H-bonds gained due to crystalline structure</p> <p>Aromatic groups + covalent bonds</p> <p>Non-polar van der Waals forces</p> <p>Polar-amide groups</p>

Cotton	Viscose	Nylon
<p>Sheets</p> <p>Good absorbency</p> <p>Good strength</p> <p>Easy to wash</p> <p>Gains strength when wet</p>	<p>Disposable nappies – filling</p> <p>Low strength not an issue</p> <p>Absorbency due to high amorphous regions</p>	<p>Tent</p> <p>Due to poor absorbency</p> <p>Due to good crystalline regions which give strength</p>

### Difficulties encountered by students

This question was generally well done. Lack of depth of knowledge, particularly in the area of regenerate fibres, resulted in weaker answers.

Many found the method of investigation difficult.

Justification of choices for appropriate end-uses also proved difficult.



- (b) (i) Wool has a keratin polymer, consisting of 20 different amino acids. The amino acid monomers are joined by peptide bonds.

Strength: Wool is a weak fibre because there are fewer H-bonds, and the van der Waals forces are insignificant. When wet, wool loses strength as it absorbs water molecules that force polymers apart and rupture some H-bonds.

The moisture absorbency of wool is excellent as molecules attract water particularly in the amorphous areas and wool can absorb up to 33% of its own weight before feeling damp.

Elasticity, wrinkle recovery and resiliency of wool: polymers are arranged in helical configuration – alpha-keratin and spiral in triplet. This gives excellence in these properties; moreover, the di-sulphide and ionic bonds compensate for low strength by aiding elasticity and wrinkle shedding.

The moisture absorbency of wool is excellent as the molecule attracts water and there are 45% amorphous areas.

Wool dyes readily because of the peptide linkages and salt bonds.

Silk has a fibroin polymer, consisting of 15 amino acids. The molecule has a very fine density and is packed tightly, being held with H-bonds. Silk is highly crystalline, making it the strongest natural fibre. Its strength also comes from the very long polymer.

The moisture absorbency of silk is lower than that of wool, absorbing only up to 11%.

The elasticity of silk is little compared with that of wool; it is high crystalline, has moderate elongation and good affinity for dyes.

Wool and silk deteriorate in sunlight, are adversely affected by alkalis, mineral acids and perspiration, but silk suffers more damage.

Both have to be carefully washed, because they weaken when wet and do not tolerate alkalis.

- (ii) Flax

Longitudinal structure, is bamboo-like and very fine.

Cross-section – multi-sided polygon, outer cuticle, shows bundles of fibre and a clear lumen.

Lustre – high

Crisp to handle

A crisp fibre, cool to wear, washes well and has a natural lustre.

Wool

Longitudinal structure – crimped fibre varying in thickness (depending on the type of sheep), covered with overlapping scales.

Cross-section – outer cuticle, with cortex cells around the central medulla.

Lustre – low

Handling – warm and soft.

Wool is a soft fibre, warm to wear as the crimp forms air pockets that keep in the warmth, requires care when washing, has a very low natural lustre. The scales contribute to poor dimensional stability which affects washing, but gives good felting properties.

(iii) Cotton is a flat, twisted ribbon.

To mercerise, cotton is placed in a solution of sodium hydroxide. This will increase strength, affinity for dye and, if applied under tension, will increase lustre.

Sodium hydroxide swells the fibre, altering the arrangements of molecules in the crystalline regions. As cellulose chains in crystallites rotate, they expose more hydroxyl groups to the amorphous fringes.

Results: Fibre swells, straightens the flat twists and become more absorbent, hence more dye is absorbed. The cylindrical shape changes from flat dull to a more lustrous fibre. The process must be under tension or the fibre will shrink (this property can be utilized in the production of seersucker or to produce plissé effects).

### Difficulties encountered by students

Many students did not have the depth of knowledge to give the required detail for this question . Most could explain wool fibre, but few could talk about silk and the section on mercerisation was poorly answered.

### Question 2 Colour

*EITHER*

(a) *Demonstrate your understanding of colour by explaining ALL of the following, using specific examples and diagrams where appropriate:*

- *spectral distribution curves*
- *colour specification*
- *metamerism.*

*OR*

(b) *Many department stores displaying white or pastel–coloured textile products are lit with floodlights, spotlights or fluorescent lighting.*

- With reference to spectral distribution curves, explain why certain colours vary under different illuminants.*
- Explain the advantage of displaying white and pastel–coloured textile products under floodlights, spotlights or fluorescent lighting as opposed to incandescent lighting.*
- Outline how technological developments in colour measurement may overcome the problems of colour perception and identification.*

(a) Spectral distribution curves:

Examples of all categories of colour should be given in answering this question.

Spectral distribution curves measure the reflection of wavelengths of colour, that is reflected light in the visible spectrum, then graph this as a percentage of reflected colour.

This method works with the light of additive primary colours - blue, green and red.

The graph indicates the visible spectrum of 400 to 700 nanometres (nm).

The darker the colour, the less reflection, black gives very little reflection, since black reflects a very low percentage level of all three colours. Light colours have high reflection and register high on the reference curves. The colour red registers high reflection in the 600 to 700 nm range, with little or no register for green and blue. The colour white gives equal reflection of all colours at a high percentage level.

Spectral distribution curves can be used to show all colours and lights, eg sunlight, fluorescent lights etc.

Colour specification:

Colour specification is used when choosing or matching colours.

There are two methods - visually, that is matching colours by the eye, one example is the Munsell System; or by computerised method - the CIE System.

The Munsell System is a psychological colour-order system that is subjective. It is based upon the principle of equal visual perception of small colour differences, printed on colour charts of small chips. These chips are arranged in terms of Munsell hues, chroma and value. Each chip represents a specific hue of a colour. This system is infinite in the number of colours and hues it can accommodate.

On a 3-dimensional colour the system presents as being solid, with black at the base and pure white at the top. The solid will bulge where the colours are their purest.

Munsell value is the central, vertical axis or dimension. It represents lightness and darkness. This value scale ranges from black to white in eleven equal steps. It specifies the lightness or darkness of a colour's hue to a grey of similar lightness or darkness.

Munsell hue is the second dimension that specifies the hue of the ten 'Munsell' colours. The principal colours are red, yellow, green, blue and purple. The 5 intermediate colours are yellow-red, green-yellow, blue-green, purple-blue and red-purple.

Munsell chroma are the third dimension that radiates from the centre of the disc. The closer the hue to the periphery of the disc, the more saturated or brighter the hue of that colour.

The CIE System is an objective specification due to its mathematical basis. It is not a colour-ordered system, it specifies the amount or proportion of the primary additive colours - blue, green and red – constituting the specific hue.

The colours are measured by a spectrophotometer.

The basic principle is that the three primary additive colours add together to give white.

Blue + green + red = white.

$1/3$  blue +  $1/3$  green +  $1/3$  red = white

x = amount of red, y = amount of green, z = amount of blue, c = colour desired

Therefore  $x + y + z = c$

The sum total of x,y,z, must always equal unity or 1. When there are equal amounts of the primary additive colours, white will result, when unequal, a hue will result.

$2/3$  x +  $3/12$  y +  $1/12$  z = a red hue results.

The chromaticity diagram is the mathematical equation represented graphically.

For the graph two co-ordinates are needed, these are the x axis and the y axis.

The graduated scales along the x and y axes show the values of the terms x and y.

The graduated scale along the perimeter of the chromaticity diagram is in nanometres (nm) which measure each colour's wavelength in millionths of millimetres.

White is in the centre of the diagram. This will identify the hue but not the luminosity.

Saturation or purity - equivalent to the chroma of Munsell. The further away the colour from the vertical y axis, the more saturated it is, ie the greatest x value on the chromaticity diagram is pure red.

Luminosity - equivalent to the value of Munsell. The lightness or brightness of a colour represented by the vertical y axis at the top is a white with 100% luminosity and 0.1 at the base is black.

The chromaticity diagram must be given.

Metamerism:

When dyed or printed textile material is examined under different lighting conditions, a marked change in colour may be observed. This phenomenon is known as, 'metamerism'. Two fabrics may appear to have the same colour under one type of illumination but appear different in colour when viewed under another type of illumination. The two coloured fabrics that appear to be of similar colour will have two different spectral reflectance curves. This is said to be a 'metamerism match'.

In order to avoid metamerism the reflectance curves of the two fabrics must coincide at all wavelengths. Thus the same colour under any type of illumination will be the same.

Metamerism presents problems to textile dyers and printers, manufacturers and consumers.

### **Difficulties encountered by students**

Spectral distribution curves:

- Many students failed to give specific examples and graphic diagrams.
- They were unable to show colours or light sources. There was little explanation of the method used.

Colour specification:

- Clearly labelled diagrams of the Munsell system were not given, and there was poor understanding of hue, chroma and the value of this system.
- The CIE diagrams were often not labelled and there was little understanding of the co-ordinates, axes and colours. Few gave specific examples.

Metamerism:

- Good definitions of the problem were given, but many failed to explain how to avoid it.
- Some students gave information that was not asked for, thus wasting time.

- (b) (i) Spectral distribution curves record the wavelength of light being emitted from a light source or being reflected from a coloured surface.

Light sources and sunlight are similar for each wavelength. Yellow, orange and red represent over 40% of the sun's spectrum, therefore light has a slightly red-yellow hue.

Incandescent light, from electric light bulbs contains an excess of yellow and red light and energy, therefore incandescent light is yellowish, although the eye perceives it as being white.

Fluorescent light contains an excess of blue and green energy and a deficiency of red.

The sources of illumination will greatly influence the colours perceived when viewing textile materials. The colouring particles in the fabric reflect the light waves from the illuminants. If the light source has an excess of one colour -, eg blue of a fluorescent light will affect the amount of reflection compared with that of another light source in the yellow-red range.

- (ii) Floodlights, spotlights and fluorescent light are all very bright, with similar spectral reference curves, therefore they have a blue tinge, creating a white effect.

White – appears whiter, cleaner, fresher under fluorescent lighting which highlights the blue end of the spectrum.

Incandescent light will produce a more yellowish effect, giving a less clear effect.

Pastels – subtle colours will appear less clear or ‘muddle’ under incandescent light. Blues will appear more greenish and, in colours that do not have identical spectral distribution curves, the chance of metamerism is increased.

- (iii) Technological development means colour measurement can be computer-controlled, thus making it accurate.

The CIE system is an objective means of specifying colour which it does in terms of the primary additive colours (blue, green and red). This makes it possible to colour-match textile materials, dyes and other coloured materials with the assistance of computer technology.

Two textile materials may appear to have the same colour when viewed under one illuminant but appear different when viewed under another illuminant.

This occurs when the prominent wavelengths within the colours are not identified with specific illuminants.

Metamerism is avoided by having identical spectral distribution curves, thereby obtaining the same colour under any type of illumination.

Use of computer technology in colour-matching has allowed quality assurance laboratories to detect the exact quality of wavelengths of colour that make up the perceived colour and can direct dyers to the modifications required.

### **Difficulties encountered by students**

References to spectral distribution curves did not show the illuminants of the various light sources and information given did not relate to the question.

Many candidates were unable to identify the predominant hue in the source of the specific illuminant so they were unable to state the effect of the various light sources on the textiles of a given colour.

There was little reference to the CIE system of colour measurement or to the technological development of overcoming the problems of perception and identification of colour.

### **Question 3      Technological Developments**

*EITHER*

- (a) *New uses of textiles continue to evolve from innovations in materials and processing in order to meet the changing needs of society.*

*Discuss this statement with reference to non-apparel uses of textiles in THREE of the following:*

- *drainage and filtration*
- *protection in the workplace*
- *medical applications*
- *transportation*

- *sport and leisure*
- *protection from environmental conditions*

OR

(b) (i) *Describe in detail the methods of production of EACH of the following technological developments:*

- *bi-component fibres*
- *open-end spinning*
- *computerised jacquard knitting*
- *spun-bonded nonwovens.*

(ii) *Select TWO of the above methods of production and discuss their advantages with respect to productivity and end uses.*

(a) Drainage and filtration:

Materials – synthetic man-made fibres, preferably with minimum water absorption.

Processing – eg spun, bonded, non-woven materials are produced by one continuous process. They are used as geotextiles, and can be engineered for mechanical and hydraulic performance, eg reduce chances of blinding/ clogging. They are used for air filtration and for ash filtration in coal-fired power generators.

It is important to couple textiles with process improvement. For example, in the case of wovens - improved weaving technology yields improved and new products, eg woven filters.

Protection in the workplace:

Materials – many flame-resistant fibres and amide fibres are produced, eg Nomex, Kevlar.

Processing – garment construction in the case of typical woven fibres, eg ingots or metal plates used in the production of older style bullet-proof vests.

Non-wovens, eg protective medical and patient garments, eg semi-conductor industry.

Medical applications:

Materials PP, PES – inert fibres and alginate fibres – as well as soluble fibres are used.

Processing –

- Artificial arteries; one example is the double needle bar Raschel.
- Hernia treatments; one example is the single bar monofil PP with Atlas lapping.
- Artificial limbs; one example is the carbon fibre component including textile substrate.

Transportation:

Materials used are typically synthetic/man-made fibres; some are made of high performance fibres eg carbon, glass, Kevlar.

Processing – the type of processing is dependent on final products, eg non-woven air filters, fan belts, tyre cords.

Components – may be non-woven (including fibre injection) or woven with the potential for knits, both weft and warp.

Sport and leisure:

Materials – full range.

Processing – the type of processing is dependant on the final product, eg braided/woven inserts for skis, golf clubs, tennis racquets.

As for protection in the work place or for sport, eg racing driver suits (flameproof etc.).

Protection from environment conditions:

Materials – usual range, can include natural fibres.

Processing – usual range, depends on overlaps with sports clothing and geotextiles with geotextiles – non-woven, primary needle punched and melt-bonded, are used and erosion control, slope stabilisation, similar to shade cloths, typically Raschel Warp knits.

NB: Materials, including not only fibre but also fabric structures (post-textile) processes.

### **Difficulties encountered by students**

Very few students attempted this question and, generally, the weaker answers were based on insufficient knowledge in this area.

(b) No student attempted this question.

## **Section II - Design**

### **Question 4 History of Clothing Design**

*EITHER*

(a) *Clothing designs have been greatly influenced by technological developments and economic patterns.*

*Discuss this statement with reference to the development of clothing design in different cultures.*

*OR*

(b) *In 1999, the 'Year of the Older Person', we are celebrating with those who have seen many changes throughout the twentieth century.*

(i) *Select a decade of fashion from the twentieth century and describe the distinctive fashion trends. Sketch and label an outfit that is indicative of this decade.*

(ii) *Design, sketch and label a complete outfit for someone who is to attend a gala ball to celebrate the 'Year of the Older Person', that is clearly inspired by the decade described in part (i).*

(iii) *Justify your design in terms of its suitability for the occasion and its reflection of the decade described in part (i).*

(a) Two different cultures were chosen and then related to influences of technological development and economic patterns on clothing design.

Discussion of technological development in the textile industries should have included reference to the synthetic fibre production and related industries, advances of yarn production and spinning, fabric production through advances in weaving and weft knitting. In addition, reference should have been made to the introduction of warp knitting and its increased percentage of the fabric market, the development of non-woven fabric as a product of the 20th

century, synthetic dyes and the hi-tech colouring and finishing industries and of computerisation through many industries. The technological development in other areas has also had an impact on clothing design, as in communications, travel, changing living standards etc.

Some cultures have been gradually affected by technological development, particularly those in isolated areas, eg in parts of Nepal. In other cultures some things have altered, but the fundamentals have remained, eg the Cuna Indians of the San Bals Archipelago still require the traditional Mola made by reverse quilting to be constructed when turning sixteen, but the type of fabric may be synthetic, zippers have been added and events of the present day may be depicted. In many modern Australian cultures and sub-cultures technological development has had almost sole influence on the dress chosen.

Discussion of economic patterns through history might have included world wars, depressions, industrialisation, crises in Asia and the world economy.

### **Difficulties encountered by students**

Cultures chosen were inappropriate for reference in answering the question .

Many students described a technological development without relating it to its influence on the clothing.

Little mention was made to the economic patterns or the influences that changed clothing of either of the cultures chosen.

- (b) (i) Many chose the 1960's Hippie generation and described well the distinctive fashion trends - the bright, bold and contrasting colours, flowers as symbols, both as adornments and as the patterning on the fabrics, clothes that were mixed and matched, many very loose fitting, bell- bottomed pants, and the unisex look. Decoration and accessories that included beads, long scarfs, platform shoes, and long hair were also described.

Sketches were clear and well labelled, giving a good indication of the fashion of the time.

- (ii) Drawings showed an adaptation of the previous sketches, often fabric was changed –, eg from cotton to an evening type fabric such as satin, the styles being shown from a more modern aspect, such as plain round neck, fitted sleeves and less strongly patterned fabric.
- (iii) Suitability for occasion – this was shown by the type of fabric chosen, eg to suit evening wear, a more sophisticated outfit was shown with trimming and decoration to suit the occasion, eg fashionable accessories for a gala ball.

The design chosen reflected the period - showing fashion trends in an outfit suitable to the occasion, but combining the features with those inspired by the earlier period, eg in the fabric design, the shape of the garment etc.

### **Difficulties encountered by students**

Many lacked sufficient knowledge of their chosen era, which made it difficult to answer all the parts of the question. The designs for the gala ball were inappropriate for this type of function.

Many garments described did not reflect the decade and there was little justification for the style chosen.



**Question 5      Theatrical design**

*EITHER*

- (a) *You have been approached by a theatre company to produce the costumes for a performance titled 'The Millennium Bug'. This comic review focuses on the possible chaos that might occur in the year 2000 when computers may shut down in a society dependent on this technology.*
- (i) *Design and sketch the costume to be worn by EACH of the two main characters, a hero and a villain (front and back views).*
  - (ii) *Explain how the costumes reflect the theme, the 'Millennium Bug', and the characteristics of a villain and a hero.*
  - (iii) *Describe the functional and aesthetic requirements of the costumes.*
  - (iv) *Design the stage set and TWO props to be used.*
  - (v) *Explain how the stage set and props will enhance the performance.*

*OR*

- (b) *A group of Aboriginal dancers is asked to visit local schools to educate students about the Dreamtime. Use the extract below [please see examination paper for extract] as an inspiration for the design of a costume for a modern dance.*
- (i) *Design and sketch a costume to be worn by the lead dancer (front and back view).*
  - (ii) *Explain how the design features of the costume reflect the nature of the character and why it is suitable for a dance production.*
  - (iii) *Discuss how the costume conveys the images portrayed in this extract.*
  - (iv) *Describe the fabrics, trims and surface decorations used in your design.*
  - (v) *List the steps involved in the construction of this dance costume.*
  - (vi) *Discuss how lighting and colour will be used to enhance the mood of the performance.*
- (a) (i) Excellent diagrams were given depicting both the 'hero' and the 'villain' in the performance of 'The Millennium Bug'.

Diagrams were well labelled, showing all features, with the difference between the good and bad being clearly shown, with some taking comic or trendy characters from fiction and adapting them to this question.

- (ii) To the characters whose costumes were to depict their personality, many added things such as antennae as being associated with the millennium bug, there was use of silver and metallic fabrics to depict the computer age, angular lines for the harsh evil characters plus the use of 'slimy' fabrics; black and red were often associated with evil. Many made use of figure-hugging clothing.

The colour gold was used for the sequences involving good characters, and bright shiny fabrics for the 'hero' with soft curves to contrast with the harshness of the 'villain'.

Circuit boards and handyman fix-it images also related to the computer and the time zone theme.

(iii) Functional:

Actors needed to be able to move in their costumes, which also needed to be designed for easy changing. If a prolonged season were anticipated, some parts of the garment needed to be dry cleanable. Each costume needed to be cool and comfortable to wear.

Aesthetic:

They needed to reflect the 'millennium bug', while the character had to be easily recognisable as villain or hero; all colours and shapes etc. had to look good under stage lights as well as blend to represent a complete and realistic character.

- (iv) The stage could be set up as a circuit board, with the use of glittering streamers, and lighting to portray good and evil as the performance required. Props should reinforce the theme - computer, mouse etc. Drawings to illustrate set and costumes should always be clear and well labelled.
- (v) It was necessary for costumes and props to be authentic.

### Difficulties encountered by students

This question required a creative approach, and most students did little to show costumes that answered the criteria of the question. Often the evil character was in black, with little reference being made to the requirements of the question. There was little reference to the millennium bug or to the problems that may occur in 2000.

The functional and aesthetic requirements described were very limited and showed a lack of understanding of the needs of theatre costume.

The stage sets did not depict the mood of the specific situation nor were they well explained.

- (b) (i) The costume sketched for the lead dancer needed to be 'magpie-like' with representation of feathers, wings, beak and the colours of a magpie.

Labelling was needed to support the sketch and explain things such as the fabric type, textures, trims, design lines and methods of openings for ease of donning the garment.

- (ii) The design had to be representative of the character, and suitable for the movements of the dance and there needed to be a characteristic mark to identify the magpie leader from the rest of the magpies.
- (iii) The points used in part (ii) were discussed to show the images portrayed.
- (iv) Fabrics discussed emphasised the points given in parts (ii) and (iii). The majority of candidates used Lycra, or a stretch fabric to allow for movement, a cape of organza to shimmer in the different lights. Trims and decoration could include feathers, beads, white satin fabric or similar fabric that gives extra texture, with plastic for beak, and swimming cap to give smoothness, while white paint was used on exposed parts of the face, hands etc.
- (v) This answer, which required a list of the construction steps that would show how the particular costume would be constructed, was adequately answered.
- (vi) There were three major light and colour segments – the first was the 'darkness' - this could be misty blue, giving a feeling of darkness with spotlights on the dancers.

Then the sky was pushed away - sudden flooding of the stage with light, intense bright light to exaggerate the broken sky.

Finally the sunshine breaks through, shown by the use of warm coloured lights, glowing all over the stage.

### Difficulties encountered by students

Many designs did not represent the character of a magpie, often the colours had no relationship to the bird.

Many candidates were able to relate how the properties of the costumes were suitable for a dance production, but they did not state how their design differentiated the magpie leader from the other magpies.

Suitable fabrics and trims were mentioned, but there was little mention of surface decoration.

Lists of the steps of construction were not given in sequence, nor was there a complete list of steps to show for the construction of the costumes.

### Question 6 Fabric Design

*EITHER*

- (a) *In a time when animal conservation is valued, the beauty of the animal kingdom could be represented in textiles by techniques that imitate the shapes and textures of nature.*

*You have been commissioned to design fabric to be used for a child's backpack.*

- (i) *Using one or more of the photographic plates on page 9 [please see examination paper for plates], sketch a fabric design for the backpack.*
- (ii) *Sketch and label a detailed section of your design, indicating design features, fabrics, techniques, colours and textures.*
- (iii) *Show the placement of this design by sketching the design on the completed backpack.*
- (iv) *Describe in detail TWO techniques indicated in part (ii) to produce the decorative effect.*
- (v) *Modify your design to create a design suitable for a child's umbrella. Sketch and fully label your design.*

*OR*

- (b) *Design a unique coordinated range of furnishing fabrics for an exclusive holiday resort in a natural rainforest location.*

- (i) *Outline the points you would consider in producing a suitable design for the fabric.*
- (ii) *Sketch your design and indicate its placement on THREE interior textile items for the foyer.*
- (iii) *Describe TWO possible techniques by which the design might be applied to, or incorporated into, ONE interior textile item for the foyer.*
- (iv) *Explain how ONE of the techniques described in part (iii) may be adapted for mass production. Justify your choice.*

- (a)
- (i) *Sketches for the design of the fabric were clear and were appropriate to one or more of the stimuli pieces. While designs were not so large as to dominate the backpack, the most suitable comprised a design that included repetition of a specific idea as a feature.*
  - (ii) *All details were given and labelled thoroughly, showing design features, fabrics, techniques, colours and textures.*

- (iii) A sketch of a backpack was given with the overall design; some of the better ones featured enlarged designs on the pockets or emphasised features of the backpack, using the design.
- (iv) The two decorative methods could have been appliqué, freehand machine embroidery, quilting, etc. Detailed information needed to be given of how these techniques were used, including threads chosen, stitch size, type of needle, use of paper-backed adhesive webbing, use of hoop, to keep material taut, etc.
- (v) The new design was adapted to the shape of the child's umbrella, using the technique of convergence.

### **Difficulties encountered by students**

The stimulus was poorly used, either being simply copied exactly on to the fabric or bearing no relationship to the original piece. Many of the designs were not suitable for children.

The techniques were not discussed in detail or were totally unsuitable for the design and backpack.

When designing for the child's umbrella, the modification of the design did not resemble the original design.

- (b) (i) Aesthetic considerations for a suitable design for the furnishing fabrics were: pleasing to look at; designs were unique and up-market; colour, texture and ideas that reflected the theme of the rainforest; relaxing and welcoming, since it is to be used in the foyer of the resort.

Functional consideration was that it needed to be comfortable for guests, suitable for the end-use, ie. curtains - sunlight, chair coverings – durable; dry cleanable.

- (ii) The designs needed to be clearly drawn and to represent the forest. The original design needed to be adaptable to three items for the interior without losing the common theme. Thus, the design needed to be alterable to suit different proportions, size, shape and different surfaces of the furnishing items.
- (iii) A suitable technique for the chosen design needed to be described in detail. These could be - appliqué, silk hand painting, printing, decorative dyeing.  
A detailed description of how to apply one of these techniques was required.
- (iv) For mass production a faster, more cost effective method needed to be chosen, in which the design or effect could utilise the technology to be applied. For example, for the silk hand painting, the mass production method could be screen printing or appliqué done by computer-controlled embroidery.

### **Difficulties encountered by students**

Points given showed little understanding of the design situation.

Designs were inappropriate for a foyer, or did not relate to the theme of a rainforest. Sketches were hard to interpret or showed little relation to the points outlined in part (i).

The techniques given did not emphasise the need to be exclusive and tended to incorporate mass produced methods that could not be adapted for the last section of the question.