**Victorian Certificate of Education
1999**

INFORMATION SYSTEMS

Common Assessment Task 3: Written examination

Thursday 11 November 1999: 11.45 am to 2.00 pm
Reading time: 11.45 am to 12 noon
Writing time: 12 noon to 2.00 pm
Total writing time: 2 hours

QUESTION BOOK

Structure of book

Number of questions	Number of questions to be answered
8	8

Directions to students

Materials
Question book of 8 pages.
One or more script books.
An approved calculator may be used.

The task
Please ensure that you write your **student number** in the space provided on the front cover of the script book(s).
This question book contains only one case study. Answer **all** questions in the script book(s) provided.
Students should answer **either** Part A **or** Part B in Question 8. All questions are of equal value.
All written responses should be in English.
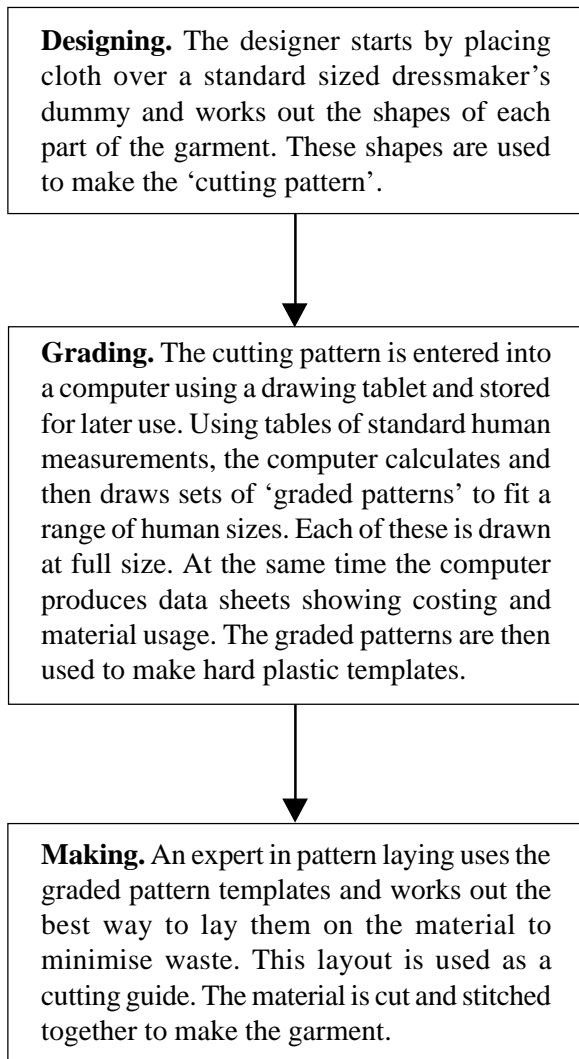
At the end of the task
Place all other script books inside the front cover of one of the used script books.
You may retain this question book.

CASE STUDY

The City Streets Clothing Company – Creators of Fine Fashions

The City Streets Clothing Company designs and manufactures a range of clothing for both men and women in their Melbourne factory. To produce a garment a three-stage process is followed. This is shown in Figure 1.
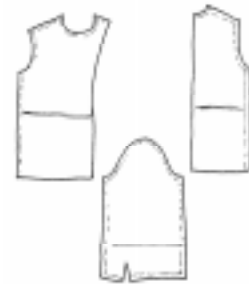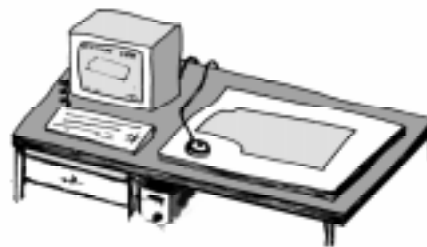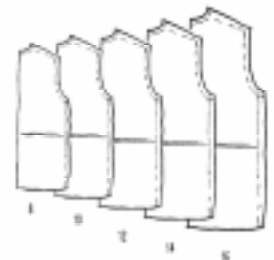
Figure 1

Dressmaker's dummy   **Cutting pattern**

Designing. The designer starts by placing cloth over a standard sized dressmaker's dummy and works out the shapes of each part of the garment. These shapes are used to make the 'cutting pattern'.

Drawing tablet   **Graded patterns**

Grading. The cutting pattern is entered into a computer using a drawing tablet and stored for later use. Using tables of standard human measurements, the computer calculates and then draws sets of 'graded patterns' to fit a range of human sizes. Each of these is drawn at full size. At the same time the computer produces data sheets showing costing and material usage. The graded patterns are then used to make hard plastic templates.

Cutting guide   **Finished garments**

Making. An expert in pattern laying uses the graded pattern templates and works out the best way to lay them on the material to minimise waste. This layout is used as a cutting guide. The material is cut and stitched together to make the garment.

The grading stage involves the use of a computer. Depending on the type of garment being designed, the computer may have to perform up to one million floating point instructions in order to produce the graded patterns. City Streets have two computers that can be used for this task.

Question 1

Figure 2 shows three block diagrams of different computer systems that could be used by City Streets' designers for the operations described above. Choose the system (A, B or C) that is best able to carry out these operations. Justify your answer.

Figure 2

A

B

C
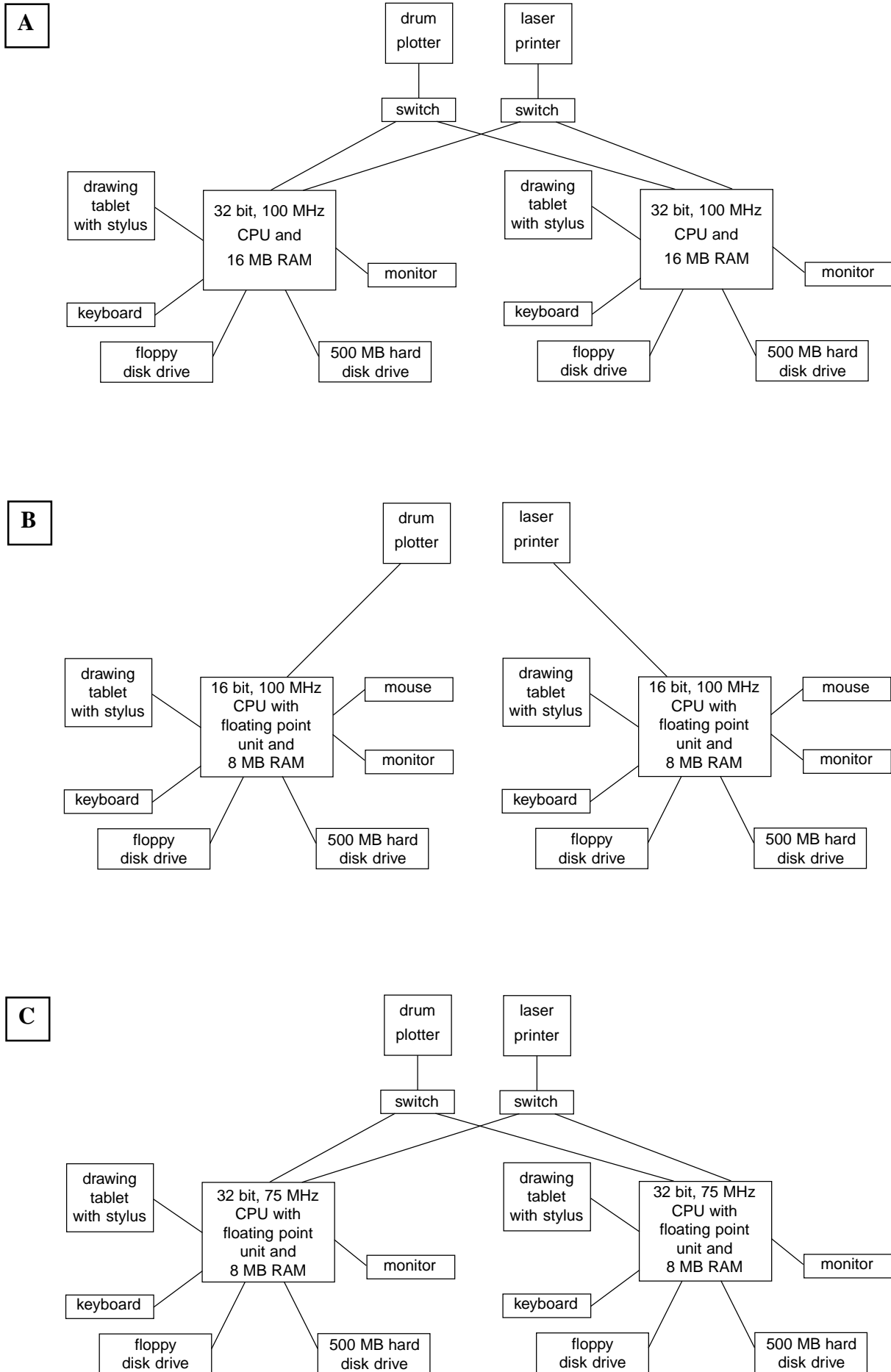
TURN OVER

Question 2

The following five features might be found in an operating system.

- user interface
- device drivers
- multi-user support
- network filing system
- file manager

These features may or may not be essential to the operating system that runs on the City Streets' computers. For each of the features listed, state whether or not it is essential and explain why or why not.

City Streets has recently noticed a reduction in sales. Market research has shown that

- City Streets' prices are not competitive compared to other clothing companies
- City Streets does not produce as broad a range of garments as other companies.

Management have therefore decided to update their design procedures by using computer-based design tools rather than the traditional method currently employed. One software product on the market is a program called eL (electronic Layout). It has the following features and capabilities.

For the design process, eL

- provides a database containing basic patterns that fit a wide range of human shapes
- provides specifications for a huge range of fabrics, including available colours and textures, and costing data
- allows the designer to draw clothing on screen
- allows designers to access each other's garment files so that they can share the design process
- animates the design on a virtual catwalk, allowing the designer to see the clothes in various postures; for example sitting or walking
- generates the cutting pattern from the design.

For the grading process, eL

- grades the cutting pattern
- can draw the graded pattern if necessary
- can produce costing data if necessary.

For the making process, eL

- generates the pattern layout to make optimum use of material
- can create a LOGI (laser operating and guidance instructions) file for use on automatic cutting machines.

However, because eL is very expensive, management is considering buying cheap off-the-shelf hardware to run eL. One off-the-shelf model has the following specifications.

- 350 MHz processor
- 32 MB RAM
- 4 GB hard disk drive
- 15" colour monitor
- 4 MB 1280 X 1024 SVGA video card
- 40 X speed Ultra Fast CDROM drive
- PCI 32-bit sound card
- 1.44 MB floppy disk drive
- midi tower case
- 104 enhanced keyboard
- ergonomic 2 button mouse and pad

Question 3

Comment on the appropriateness of this off-the-shelf computer given eL's features and capabilities.

Assume City Streets purchases eL. This package will produce a file of LOGI instructions. Any LOGI-compatible cutting machine can use this file. Therefore the garments can be manufactured anywhere in the world. Smart Cut Tailors (SCT) of Lapen, in SE Asia, have recently installed a new cutting and sewing system. As a result, SCT is looking for business opportunities, and has offered to cut and manufacture garments for the City Streets Clothing Company very cheaply.

The City Streets Clothing Company wishes to investigate the possibility of transferring LOGI files to SCT via the Internet. LOGI files need to provide very detailed instructions to the cutting and sewing machines. These files can be several megabytes in size.

The City Streets Clothing Company also needs access to the Internet so that they can get on-line assistance from the manufacturers of their new garment design and pattern-making system and download new information about fabrics and fashions.

Question 4

Assume City Streets Clothing Company purchases eL and a number of off-the-shelf computers. They will need access to the Internet to transfer LOGI files to SCT quickly and securely. Describe any other equipment, hardware and software that will be required, taking into account

- hardware specifications
- features required by the software.

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Assume the City Streets Clothing Company purchased the necessary equipment. In order to test the new equipment they sent a simple test pattern to SCT. This test pattern consisted of LOGI instructions to draw a square. Rather than risk damaging the cutting and sewing machines, the test pattern should draw the square on the computer screen at SCT. The City Streets Clothing Company made several attempts to transmit the test pattern, with the following results.

First attempt: SCT reported that no pattern data arrived. Both the City Streets Clothing Company and SCT carefully checked all the connections between their computers and the communications equipment. They found that all devices were connected correctly.

Second attempt: SCT reported that some data arrived, but absolutely nothing appeared on the computer screen at SCT. One of the SCT engineers examined the data and declared, 'This does not look like a set of LOGI instructions'. The City Streets Clothing Company engineers assured SCT that they had sent a LOGI file.

Third attempt: SCT reported that a LOGI file arrived but, instead of drawing a square on the screen, the resulting figure looked like the diagram shown below.
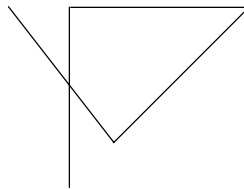
Question 5

For each of these three attempts, suggest a reason for the problem. Justify your answer in each case.

The LOGI language includes the following six simple instructions.

Command	Parameter	Description
HOME		moves the laser cutting head to the centre of the cloth
L1		turns laser on
L0		turns laser off
BYE		checks that the laser cutting head is off and moves it to the edge of the cutting table where it is out of the way
RT	angle	turns the laser cutter right by **angle** degrees
FD	length	moves the laser cutter forward by **length** units

When all the problems with the test pattern had been corrected, the first real garment pattern was sent from City Streets Clothing Company to SCT. This pattern caused the laser cutter to attempt to cut all the shapes about 25 times too big.

Further investigation revealed that SCT had downloaded their cutting software from an American web site. This American version expected the FD length units to be in inches, whereas the metric version of the software installed by the City Streets Clothing Company uses millimetres in the instructions. SCT cannot afford to buy the metric version of the software so they need to write a program to convert the measurements in the LOGI files from millimetres to inches.

The following instructions are available for manipulating LOGI files.

Instruction	Effect
OPEN filename	opens a LOGI file called filename
READ filename	reads next data item from file, for example FD, L1, 90 or 300
WRITE filename	writes current data item to file called filename
CLOSE filename	closes file called filename

Other standard programming control structures such as looping and branching may be used.

Sample LOGI file to draw and cut out a square:

HOME L1 FD 300 RT 90 FD 300 RT 90 FD 300 RT 90 FD 300 RT 90
L0 BYE

Question 6

Write an algorithm that will read all LOGI instructions, check for those that include a length measurement, change this length from millimetres to inches by dividing by 25.4 and write each instruction to an output file.

Question 7

When City Streets did their market research, a close analysis of the old system showed that one reason that prices were too high was a large wastage of material. This occurred because the pattern template layouts were done manually. Therefore one of the aims of the new system is to reduce this wastage.

Another aim is to make the design process quicker so that a greater range of garments can be produced in the same length of time.

a. Describe the records that could have been kept when using the old system.

b. Indicate what records could be kept after the new system is introduced.

c. How would these two sets of records be used to check whether these aims for introducing the new system are being achieved?

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Question 8

<div style="border:1px solid black; display:inline-block; padding:4px;">**Answer either Part A or Part B**</div>

Part A

> Joe, one of the young fashion designers, is very pleased with his designs for the winter season and believes that they will be very popular. He is looking forward to seeing the first production of all the garments. Naturally, he became very concerned when he heard from other workers that the company was going to send his designs electronically to another country to be manufactured.

Describe **three** different issues that Joe might be concerned about. Outline two other possible concerns for the company and society in general, resulting from this use of information technology.

OR

Part B

> Company officials have been to visit the overseas factory where all their garments are to be made. Production is very efficient with the entire manufacturing process being computer controlled. When the garments have been cut out, the pieces are put on a coat hanger with a barcode attached. As workers receive each coat hanger they scan the barcode and when they have finished their part they scan it again. From this, the company can find out who is doing poor work, who works too slowly, and who leaves their work space. The company officials think this is excellent but the union representative is concerned.

Describe **three** different issues that the union representative might be concerned about. Outline two other possible concerns for the company and society in general.

END OF QUESTION BOOK