BOARD OF STUDIES
NEW SOUTH WALES

HIGHER SCHOOL CERTIFICATE EXAMINATION

1995

COMPUTING STUDIES

2 UNIT GENERAL

Time allowed—Three hours
(Plus 5 minutes' reading time)

DIRECTIONS TO CANDIDATES

Section I (20 marks)

- Attempt ALL questions.
- Mark your answers in pencil on the Answer Sheet provided.

Section II (80 marks)

- Attempt ALL questions.
- Answer the questions in the spaces provided in this paper.
- Write your Student Number and Centre Number in the spaces provided on the first page of each question.

SECTION I

Attempt ALL questions.

Each question is worth 1 mark.

Select the alternative A, B, C, or D that best answers the question.

Mark your answers in pencil on the Answer Sheet provided.

USE THE SPREADSHEET EXTRACT BELOW TO ANSWER QUESTIONS 1 TO 3.

	A	B	C
1	WATER	TEMPERATURES	
2			
3	Month	Water temp.	Swimming
4	May	16	
5	June	17	
6	July	18	
7	August	21	
8	September	22	
9	October	17	

1. This spreadsheet contains data on water temperatures. In cells C4 : C9 the words 'swimming OK' are printed if the water temperature is over 17°; otherwise 'too cold' is printed.

   The correct formula for C4 is

   (A) = IF (B4 < 17, "too cold", "swimming OK")

   (B) = IF (B4 > 18, "swimming OK", "too cold")

   (C) = IF (B4 >= 17, "swimming OK", "too cold")

   (D) = IF (B4 <= 17, "too cold", "swimming OK")

2. The spreadsheet above is to be changed to allow the user to enter the coldest temperature at which a person will swim. This temperature is entered in cell C2. Choose the formula to be entered into C4 and copied to C5 : C9.

   (A) = IF (B4 >= C2, "swimming OK", "too cold")

   (B) = IF (B4 >= C2, "swimming OK", "too cold")

   (C) = IF (B4 >= $C2, "swimming OK", "too cold")

   (D) = IF (B4 >= C2 , "swimming OK", "too cold")

3. This spreadsheet is now set to manual calculation. When the coldest temperature at which each new swimmer will swim is entered into the spreadsheet, the following actions should be carried out.

(A) The spreadsheet should be recalculated.

(B) Column C should be deleted and the spreadsheet recalculated.

(C) New formulae should be added and the spreadsheet recalculated.

(D) Column C should be deleted, new formulae added, and the spreadsheet recalculated.

4. All the data of a large spreadsheet are to be imported into a database *once* only as a new file. The most efficient way to do this is by using

(A) a clipboard copy and paste.

(B) an export-format file.

(C) a dynamic data linkage.

(D) a file-conversion filter.

5. Which of the following is an example of a *built-in* function in a spreadsheet?

(A) save

(B) average

(C) percentage

(D) recalculate now

6. A pixel is best described as

(A) one of the coloured phosphors on a graphic screen.

(B) one of the three colours represented by an RGB monitor.

(C) the smallest part of a screen that can be controlled by a computer.

(D) the smallest element of computer memory that holds a graphic image.

7. A computer network that extends beyond the physical boundary of an organization's building would normally be implemented as a

(A) WAN

(B) V.42bis

(C) LAN

(D) RS232

USE THIS INFORMATION TO ANSWER QUESTIONS 8 TO 11.

MOVIES AT THE CINEMAS

Sydney Morning Herald, 7/2/95 p 1 (adapted).

8. These data are to be put into an electronic database. How many fields would be included in this database?

(A) 4
(B) 5
(C) 6
(D) 7

9. The data contained on the dark clipboard headed *Disclosure* would be entered into the database as a

(A) cell.
(B) file.
(C) field.
(D) record.

10. To *display* the data about only those movies that have a PG rating, the user would carry out a

(A)   sort.

(B)   search.

(C)   selection.

(D)   separation.

11. What movies will be found if the search specification below is applied?

(rating contains "G") AND (review = "excellent")

(A)   *The Mask, Lion King, Surfing, Valentine, Richie Rich*

(B)   *Nell, The Mask, Surfing, Disclosure*

(C)   *The Mask, Surfing*

(D)   *Surfing*

12. In a computer animation sequence, the process of changing the image of a dog into that of a cat is called

(A)   editing.

(B)   distorting.

(C)   morphing.

(D)   vectoring.

13. A data packet is to be sent through a network to a terminal. The packet passes through each node until it reaches the terminal, or until it returns to the sender. The network topology is

(A)   star.

(B)   ring.

(C)   mixed.

(D)   bus.

14. To access a secure building, an employee inserts a magnetically coded card into a card reader. The signal generated by the card reader is transmitted to the controlling computer. What mode of communication is used?

(A)   duplex

(B)   simplex

(C)   multiplex

(D)   half-duplex

USE THESE REPRODUCTIONS TO ANSWER QUESTIONS 15 TO 18.
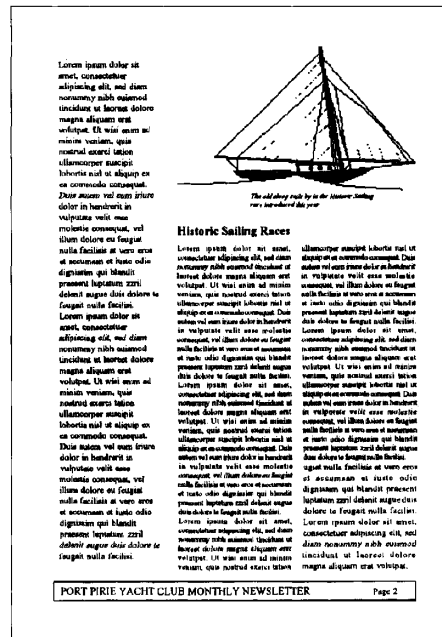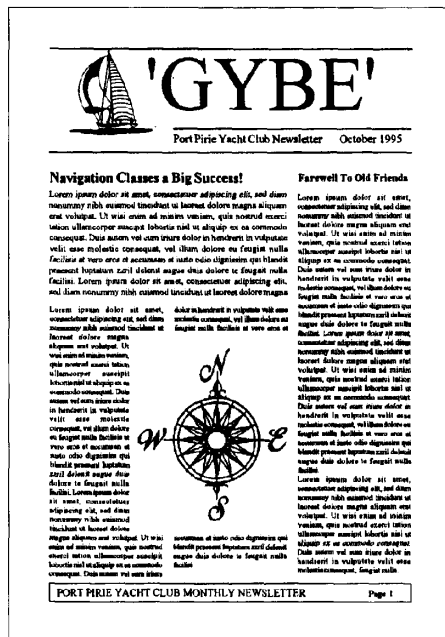
Page 1   Page 2

A TWO-PAGE SAILING-CLUB NEWSLETTER

15.   This newsletter contains examples of

  (A)   a footer, column text, and a gutter.

  (B)   a footer, portrait pages, and column text.

  (C)   portrait pages, a footer, and a gutter.

  (D)   portrait pages, a drop cap., and column text.

16.   Look at the words at the top of column two on page 2 of the newsletter. The most appropriate desktop-publishing term to describe the words is a

  (A)   banner heading.

  (B)   page header.

  (C)   publication header.

  (D)   typographic heading.

17. Look at the story on page 2 of the newsletter. It begins in column two and finishes in column three. This is an example of

(A) text-wrap round a graphic.

(B) column justification.

(C) text linking.

(D) continuation.

18. The sailing-boat graphic on page 2 of the newsletter originally appeared as shown below.
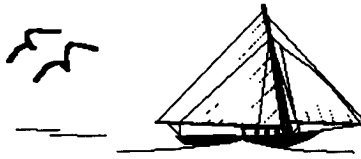
The graphic in its final form in the publication is

(A) cropped.

(B) edited.

(C) sized.

(D) scaled.

19. A user selects a rectangle displayed on a graphic screen, and then chooses a different line width from a menu. This changes the thickness of the lines forming the rectangle. The original rectangle must have been drawn using

(A) an 8-bit colour graphics package.

(B) a monochrome graphics package.

(C) a pixel-based package.

(D) a vector-based package.

20. GIF is a file format used to transfer

(A) graphical data between different applications.

(B) grid information between a spreadsheet and a database.

(C) gigabytes of data between database management systems.

(D) geographic information from text files to a graphics plotter.

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SECTION II

Marks

QUESTION 21. Spreadsheets (16 marks)

(a)   Define the following terms as they apply to spreadsheets.   **5**

(i)   Cell ....

....

....

(ii)   Template ....

....

....

(iii)   Macro ....

....

....

(iv)   Creating a macro requires some effort on the part of the user. Explain why macros are created. Give an example of where a macro might be used.

....

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....

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....

....

QUESTION 21. (Continued)   **Marks**

(b)   The following diagram represents the screen displays produced by a spreadsheet   **5**
package. Diagram 1 shows the values in each cell and Diagram 2 shows the
formulae.

	A	B	C	D	E
1	BUDGET				
2		JAN	FEB	MAR	TOTAL
3	INCOME	3400	2900	2580	8880
4					
5	EXPENSES				
6	Mortgage	830	830	830	2490
7	Groceries	300	250	300	850
8	Car	220	240	680	1140
9	Utilities	180	150	270	600
10	No. Expenses=	4			
11	TOTAL				
12	EXPENSES	1530	1470	2080	5080
13					
14	BALANCE	1870	1430	500	99999999999

DIAGRAM 1

	A	B	C	D	E
1	BUDGET				
2		JAN	FEB	MAR	TOTAL
3	INCOME	3400	2900	2580	=SUM(B3..D3)
4					
5	EXPENSES				
6	Mortgage	830	830	830	=SUM(B6..D6)
7	Groceries	300	250	300	=SUM(B7..D7)
8	Car	220	240	680	=SUM(B8..D8)
9	Utilities	180	150	270	=SUM(B9..D9)
10	No. Expenses=				
11	TOTAL				
12	EXPENSES	=SUM(B6..B9)	=SUM(C6..C9)	=SUM(D6..D9)	=SUM(B12..D12)
13					
14	BALANCE	=B3 – B12	=C3 – C12	=D3 – D12	=E3 – E14

DIAGRAM 2

QUESTION 21. (Continued)   **Marks**

(i) The formula in cell E14 produces unpredictable values when the spreadsheet is recalculated.

1. Explain what is wrong with the formula.

....

....

2. Write the correct formula.

....

(ii) What formula has been entered in cell B10 to obtain the given result?

....

Use the following charts to answer parts (iii) and (iv). They are generated from the same data block.
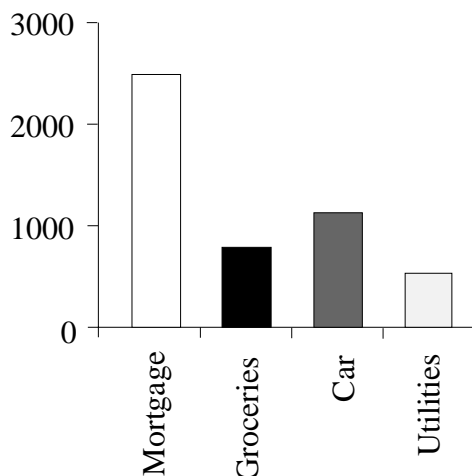
CHART A
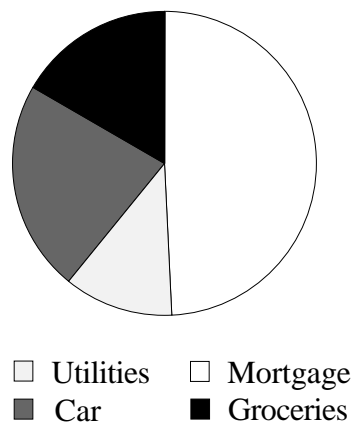
CHART B

(iii) Write the cell references for the data block used to create these charts.

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(iv) A user wants to show how her money is spent. Which chart is more suited to this task? Give reasons for your answer.

....

....

....

QUESTION 21. (Continued)

Marks

	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

QUESTION 21. (Continued) **Marks**

(c)   A teacher organizing a camp for Year 7 with 105 students in the year, decides to   **6**
create a spreadsheet template to assist. The data the teacher wants to enter are:

- number of students going on the camp;
- booking-fee for the camp site ($300);
- accommodation cost per student ($80);
- capacity of each bus (55);
- cost of each bus ($88).

The teacher wants the spreadsheet to calculate the:

- number of buses needed;
- cost of bus hire;
- total cost of the camp;
- cost per student.

(i)   On the grid provided on page 12, draw a layout of the template. Enter labels, data, and formulae that would be used in the spreadsheet.

NOTE. The number of buses is found using the formula:

=INT((number of students − 1) / bus capacity) + 1

(ii)   Mark on the grid the areas used for input, output, calculation, and instruction.

(iii)   Describe a situation where the teacher might use this spreadsheet to answer a 'what if' question.

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QUESTION 22. Databases (16 marks)

Marks

Use the following information to answer parts (a), (b), and (c).

A motel uses a computer database consisting of a number of files. The GUEST file contains eleven fields:

- guest ID
- family name
- given name
- guest type (either B for business guests or V for vacation guests)
- organization
- address
- arrival date
- departure date
- room number
- room type
- total cost.

(a)   (i)   A query language is used with this database. What is a query language?   **5**

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....

....

(ii) Previously this database existed as a paper file only. Describe a situation where it is quicker to use this computer-based system than the paper one.

....

....

....

....

QUESTION 22. (Continued)   **Marks**

      (iii)   A data dictionary includes information on field types and field widths.

           What type of field should be used for:

           1.   arrival date? ....

           2.   address? ....

           3.   room number? ....

           4.   total cost? ....

      (iv)   Why is field width included in a data dictionary?

           ....

           ....

(b)   (i)   The field 'guest ID' is included in each record as a primary key. The   **5**
           field 'family name' cannot be used as a primary key. What is the reason
           for this?

           ....

           ....

           ....
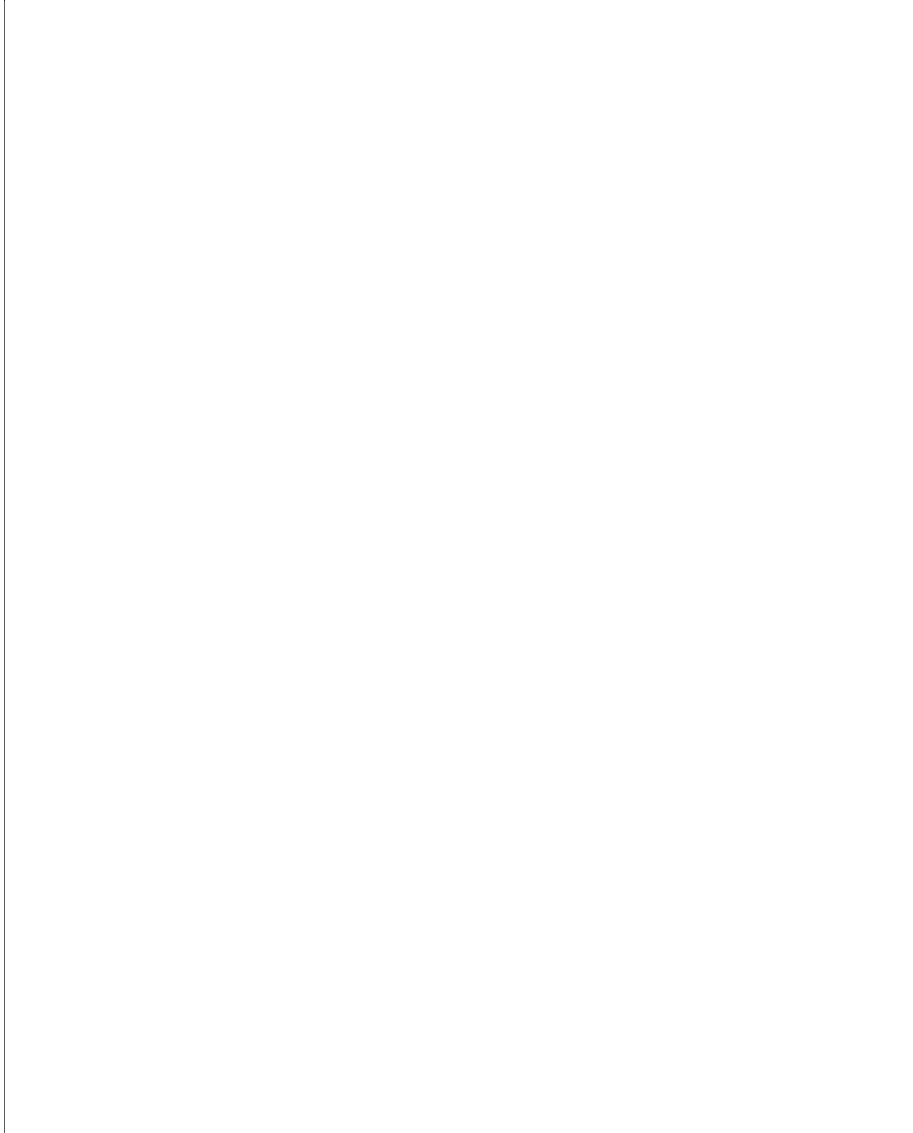
      (ii)   Reports can be displayed either as a table view or form view. Give an
           example where a table view would be used with this database.

           ....

           ....

           ....

19

QUESTION 22. (Continued) **Marks**

(iii) You are to design a screen layout to be used for taking bookings. You are to include the following field names: family name, given name, address, arrival date, departure date. Put your screen layout in the space below.

QUESTION 22. (Continued)   **Marks**

(c) (i) On 1 May and 1 November each year, the motel sends a personal letter to   **6**
          each business guest who has not stayed at the motel in the last six
          months. These guests are advised of a special deal.

     1. Write a search specification to identify the guests who will be sent a
         letter on 1 November of this year (1995).

     2. Describe how the motel could arrange for the individual letters to be
         prepared automatically.

         ....

         ....

         ....

         ....

(ii) In order to bill guests for telephone calls made from a room, the motel
      automatically records the following information: the room number, date,
      time, telephone number called, and length of each call. The data are
      stored in a 'charges' file in the database.

     1. A guest claims that this is an invasion of privacy. Give a logical
         argument to support the guest's claim.

         ....

         ....

         ....

         ....

     2. The motel management claims there is no invasion of privacy
         because it controls access to the data.

         Describe the steps management could take to control access to the
         data.

         ....

         ....

         ....

         ....

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QUESTION 23. Graphics (16 marks)

Marks

(a) One purpose of graphics is to communicate information. The following graphs   **5**
show the depth of snow in the 1994 ski season.
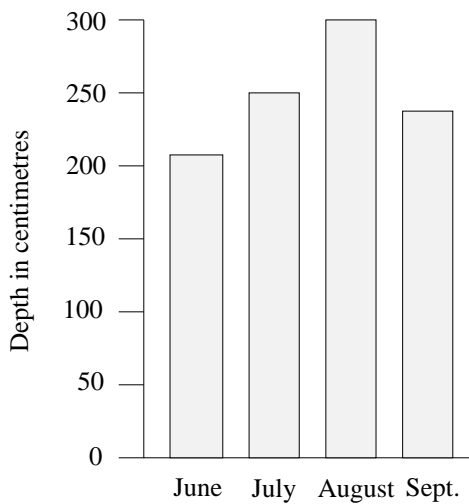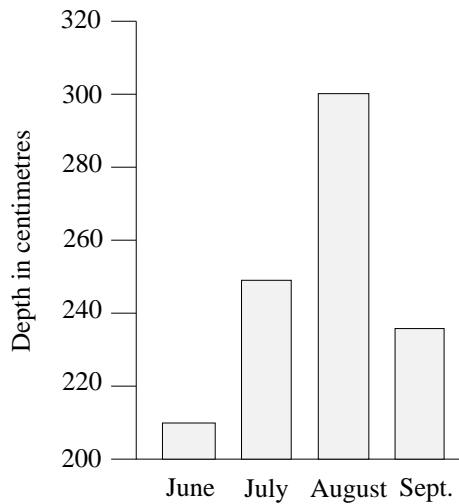
FIGURE 1

FIGURE 2

(i) Both graphs convey the same information.

1. Describe TWO different impressions made on the reader by the two
graphs.

....

....

....

....

2. Explain how this has been achieved.

....

....

Question 23 continues on page 22

QUESTION 23. (Continued)   **Marks**

     (ii) Graphic programs use either bit-mapped or vector graphics. Images are stored and manipulated differently by these programs.

          For each of the following, tick the column to show whether *bit-mapped* graphics or *vector* graphics is more appropriate.

	Bit-mapped graphics	*Vector graphics*
Erasing an individual pixel		
CAD programs		
Changing the size of a circle		
Using coordinates to store lines in memory		

(b)   (i) Consider the following graphic image, and neatly redraw it after the given transformations.   **5**

reflection
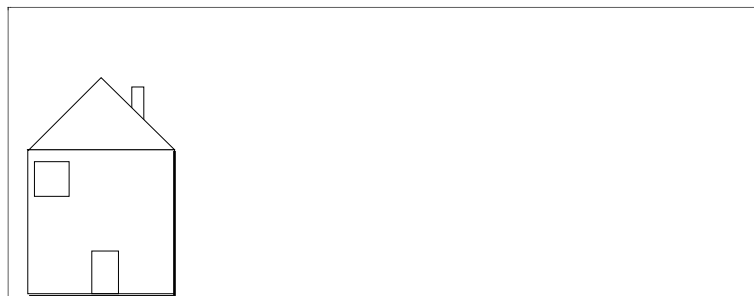
rotation
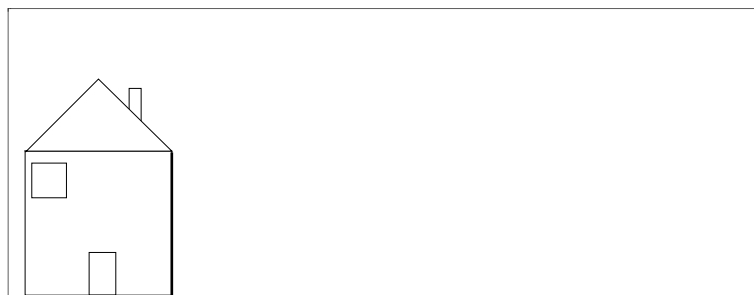
distortion
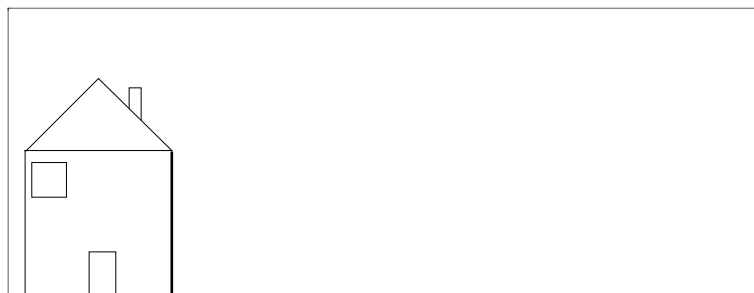
QUESTION 23. (Continued)

    (ii) An animation is to be created. It shows a football leaving a player's boot and travelling between the goalposts.

Which form of animation would you choose for this task? Explain why you would choose this form.

....

....

....

....

(c)   (i) In a particular computer system, each pixel can display 16 colours.

6

How many bits are required to store the colour of each pixel?

....

....

    (ii) To calculate the number of kilobytes needed to store an image, the following must be known.

- The number of pixels horizontally (H).
- The number of pixels vertically (V).
- The number of bits needed to display the colour of each pixel (C).

State how you would perform this calculation.

....

....

....

....

....

....

QUESTION 23. (Continued)   **Marks**

    (iii)   Either *static* or *dynamic* data integration can be used to import and export data.

          What is the difference between these types of data integration?

          ....

          ....

          ....

          ....

    (iv)   Give an example of *static* data integration.

          ....

          ....

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QUESTION 24. Desktop Publishing (16 marks)

Marks

(a)   Define each of the following desktop-publishing components.

5

(i)   Ruler guide ....

....

....

(ii)   Kerning ....

....

....

(iii)   Master page ....

....

....

(iv)   Gutter ....

....

....

(v)   Typeface ....

....

....

QUESTION 24. (Continued) **Marks**

(b) You have commissioned a desktop-publishing company to design a school **6**
prospectus brochure. The prospectus includes general details of the school and
descriptions of courses offered. Illustrations are also included.

The brochure is designed to:

- fold as shown in the diagram below;
- have space to allow an address to be included, so that it can be sent by mail.
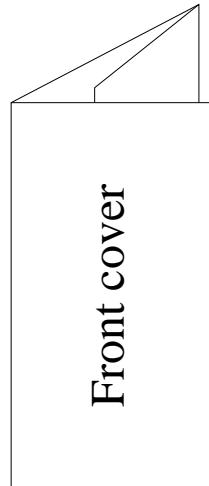
The publishing service has sent back draft page layouts for the brochure. They
are shown below in miniature form. The grey areas represent spaces for
illustrations.
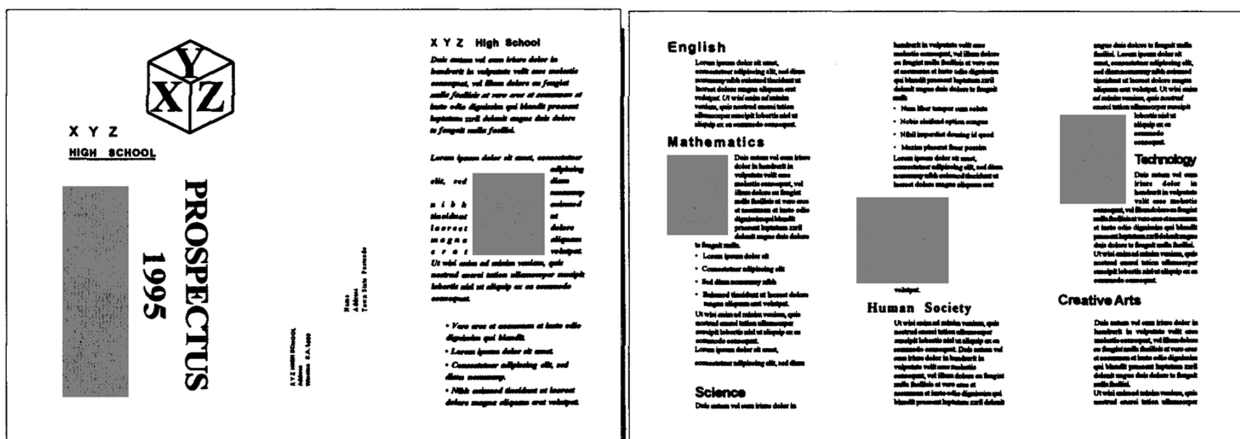
QUESTION 24. (Continued)

    (i)   Describe THREE design faults with the brochure.

        1. ....

            ....

            ....

        2. ....

            ....

            ....

        3. ....

            ....

            ....

    (ii) In your brochure, you want to include part of a picture taken from a magazine. Describe the steps you would take to do this. In your answer refer to any necessary hardware and software.

        ....

        ....

        ....

        ....

        ....

   (iii) Explain where a file-conversion filter would be used in producing the text in this brochure.

        ....

        ....

        ....

        ....

QUESTION 24. (Continued)   **Marks**

(c)   (i)   On the sample document below, use the letters A to E to identify and   **5**
             label the following:

             A   a call-out

             B   a sanserif typeface

             C   modified leading

             D   text-wrap round a graphic

             E   text enhancement using a changed stroke weight.

             This section describes the commands associated with the ONLINE modifier functions.

             The ONLINE command modifiers provide greater *flexibility, speed and accuracy* of model construction. This is achieved by increasing the scope of a command in either the availability of options, increased selectivity, and database model manipulations.

             The ONLINE command modifiers can be accessed during the operation of most MAIN menu commands. They can be enabled anywhere within

             "The ONLINE command modifiers provide greater *flexibility, speed and accuracy...*"

             the command except when a menu selection is required (i.e. if the cursor is an 'arrow').

             If the current command is locations or entities (i.e. if the cursor is a 'cross-hair'), positioning the cursor against any boundary of the graphics display area and pressing the snap/help button enables the ONLINE menu.

             The ONLINE menu can be enabled any number of times, at the appropriate state, within the same command execution.

      (ii)   Give the correct term for a text enhancement using changed stroke
             weight.

             ....

      (iii) Desktop-publishing programs produce full text justification by increasing
             the spaces between words on a line. This may reduce the readability of
             the text in narrow columns, as shown in the sample document above.

             State TWO ways to improve readability in this situation.

             ....

             ....

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QUESTION 25. Computer Communications (16 marks)   **Marks**

(a)   A section of a large company uses a local-area network that has a bus network   **5**
       topology. The network has one file server, one print server, a printer, and four
       workstations.

    (i)   Sketch the network.

    (ii)   Describe the function of the print server.

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        ....

    (iii)   A second file server is added to the network. Describe how access to
        each file server would be controlled.

        ....

        ....

    (iv)   Describe two procedures that could be used to provide security for files
        on the network.

        ....

        ....

        ....

        ....

QUESTION 25. (Continued) **Marks**

(b)   (i) Z-modem is a file-transfer protocol. It is used in downloading or uploading files.   **5**

Describe the principle of transmission using Z-modem.

....

....

....

(ii) Why are files compressed before transmission in a computer communication system?

....

....

....

(iii) Describe a method by which the following text could be compressed.

'the computer class compared their answers to the question.'

....

....

....

....

....

(iv) An unauthorized user could access a bulletin-board system by guessing passwords. What steps could be taken to prevent this?

....

....

....

QUESTION 25. (Continued) **Marks**

(c) You are a subscriber to an electronic information service that provides the   **6**
following facilities:

 • electronic mail

 • bulletin boards and message areas

 • file libraries

 • databases.

You connect to the service from your personal computer via standard telephone
lines, a modem, and communication software.

You are charged for the use of the service at a flat hourly rate.

  (i) In preparing your communication software to connect to the service,
several settings have to be made.

Name ONE of these settings. State its purpose.

....

....

  (ii) State TWO ways you could minimize your cost for using the service.

1. ....

....

2. ....

....

  (iii) Why would you use the bulletin board rather than electronic mail to send
a message?

....

....

....

....

  (iv) One database on the service contains the news sections of a daily
newspaper. Why would you access this service rather than using printed
copies? Give TWO reasons.

1. ....

....

2. ....

....

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