BOARD OF STUDIES
NEW SOUTH WALES

HIGHER SCHOOL CERTIFICATE EXAMINATION

1999

COMPUTING STUDIES

2 UNIT GENERAL

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

DIRECTIONS TO CANDIDATES

- No calculators are to be used.

Section I (20 marks)

- Attempt ALL questions.

- Write your Student Number and Centre Number on the Answer Sheet provided.

- Complete your answers in either blue or black pen on the Answer Sheet provided.

Section II (80 marks)

- Attempt ALL questions.

- Write your Student Number and Centre Number in the spaces provided on the first page of each question.

- Answer the questions in the spaces provided in this paper.

SECTION I

(20 Marks)

Attempt ALL questions.

Each question is worth 1 mark.

Instructions for answering multiple-choice questions

- Complete your answers in either blue or black pen.

- Select the alternative A, B, C or D that best answers the question. Fill in the response oval completely.

Sample: $2 + 4 =$ (A) 2   (B) 6   (C) 8   (D) 9

A ⬭   B ⬤   C ⬭   D ⬭

If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

A ⬤   B ⨂   C ⬭   D ⬭

If you change your mind and have crossed out what you consider to be the correct answer, then indicate the correct answer by writing the word **correct** and drawing an arrow as follows.

correct

A ⨂   B ⨂   C ⬭   D ⬭

1   The graphic that best shows the relative proportions of the parts to a whole is a

    (A)   bar chart.

    (B)   pie chart.

    (C)   line chart.

    (D)   scatter chart.

USE THE SPREADSHEET BELOW TO ANSWER QUESTIONS 2, 3 and 4.

A sportsperson uses a spreadsheet to help plan diets. Shown below is the *Diet Table* spreadsheet that deals with the composition and energy values of milk products.

Diet Table

	A	B	C	D	E
1	**Product name**	**Protein**	**Fat**	**Carbohydrate**	**Total energy**
2	Skim milk	3·5	0·1	4·9	148
3	Normal milk	3·4	3·9	4·7	284
4	Goat's milk	3·0	2·5	4·2	217
5	Soya milk	3·2	3·0	6·8	281
6					
7	**Energy factor**	**18·5**	**37·2**	**16·3**	
8				**Average energy**	232·5

2   The following formula was used in cell E2 to calculate the total energy of the skim milk product:

$$= 3·5 * 18·5 + 0·1 * 37·2 + 4·9 * 16·3$$

The formula needs to be copied down to cells E3 : E5 to calculate the total energy for the other milk products. A better formula to put into cell E2 would be

    (A)   = B2 * B7 + C2 * C7 + D2 * D7

    (B)   = B2 * B$7 + C2 * C$7 + D2 * D$7

    (C)   = B$2 * B7 + C$2 * C7 + D$2 * D7

    (D)   = B$2 * B$7 + C$2 * C$7 + D$2 * D$7

3 Cells A2 : D5 are sorted into ascending order based on the carbohydrate content. What value will now appear in cell E4?

(A) 148

(B) 217

(C) 281

(D) 284

4 The average energy for the milk products is calculated in cell E8. The built-in function to do this would be

(A) SUM (B2 : D5)/4

(B) AVERAGE (E2 : E5)

(C) (E2 + E3 + E4 + E5)/4

(D) AVERAGE (E2 : E5)/4

5 A primary key is best defined as a

(A) type of password.

(B) button on a key pad.

(C) mechanical lock to a computer.

(D) field used to identify a unique record.

6 To retrieve selected data from a database, you would use a

(A) list.

(B) tuple.

(C) table.

(D) query.

7 The word used in a search to indicate that two conditions must be met before a record is selected is

(A) OR.

(B) NOT.

(C) AND.

(D) EITHER.

8   Arranging the records of a database into a specified order is called

  (A)   sorting.

  (B)   querying.

  (C)   reporting.

  (D)   searching.

9   A display that can produce 16 colours requires

  (A)   2 bits per pixel.

  (B)   4 bits per pixel.

  (C)   8 bits per pixel.

  (D)   16 bits per pixel.

10   The process of taking two images of an animation and producing intermediate images so that the animation is smoother is

  (A)   warping.

  (B)   distorting.

  (C)   tweening.

  (D)   morphing.

11   The line represented in Diagram 1 has a staircased look. Diagram 2 represents the same line after a graphic technique has been applied to reduce the staircased effect.

☐ = 1 pixel
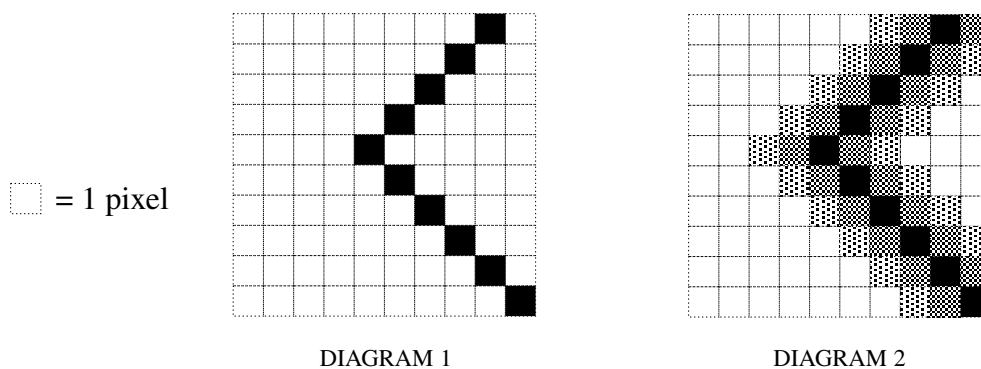
DIAGRAM 1   DIAGRAM 2

  The technique is called

  (A)   jaggies.

  (B)   aliasing.

  (C)   resizing.

  (D)   pixel averaging.

12   Diagram 3 shows a section of a computer screen showing part of a graphic. Diagram 4 shows the SAME section of the screen after the graphic has been resized.

= 1 pixel

DIAGRAM 3   DIAGRAM 4
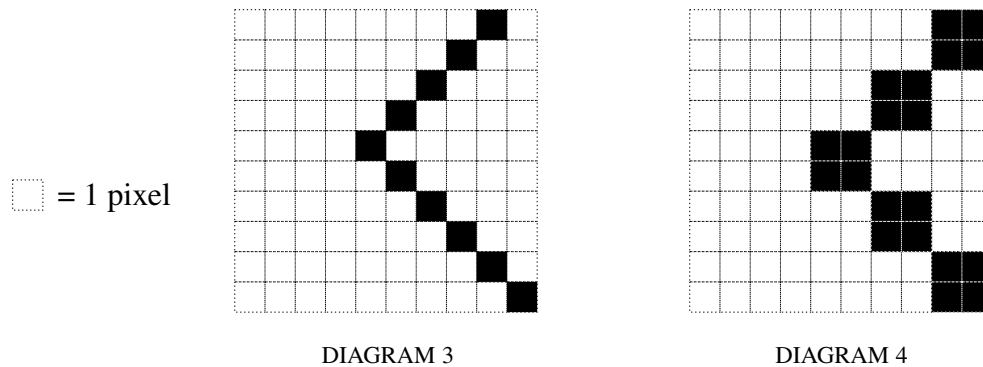
The graphic was most likely produced using a package which was

(A)   cel-based.

(B)   path-based.

(C)   bit-mapped.

(D)   vector-mapped.

13   Justifying a paragraph means to

(A)   move text.

(B)   align the text.

(C)   change the text.

(D)   correct the spelling of the text.

14   In desktop publishing, a gutter is the

(A)   placement of text around a graphic.

(B)   space allowed at the bottom of a page for footnotes.

(C)   extra space allowed at the side of a page for binding.

(D)   white space between the text and the edge of the page.

15   In desktop publishing, Helvetica, Times and Courier are examples of different typeface

(A)   sizes.

(B)   designs.

(C)   attributes.

(D)   descenders.

16 The factor that determines the resolution on a printed page is its

(A) dots per inch.

(B) stroke weight.

(C) number of pixels.

(D) characters per inch.

17 A computer network topology with a central host is a

(A) bus.

(B) ring.

(C) star.

(D) hybrid.

18 Protocols are best defined as

(A) handshaking parameters.

(B) polite ways of sending email.

(C) sets of rules for data transmission.

(D) the earliest forms of data transmission.

19 X-modems, Z-modems and Compuserve-B are

(A) brands of modems.

(B) terminal emulation packages.

(C) types of error checking.

(D) file-transfer protocols.

20 The process by which an authorised user gains access to a remote computer system is known as

(A) logon.

(B) hacking.

(C) uploading.

(D) interfacing.

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STUDENT NUMBER

1999
HIGHER SCHOOL CERTIFICATE EXAMINATION
COMPUTING STUDIES
2 UNIT GENERAL

CENTRE NUMBER

SECTION II

Marks

(80 Marks)

Attempt ALL questions.

QUESTION 21 Spreadsheets (16 marks)

(a)   Complete the following table using spreadsheet terminology.   **4**

Term	Definition	Example
(i) Built-in arithmetic function	a predefined set of operations built into spreadsheet software	Sum (B2 : B7)
(ii)	the intersection of a row and a column	
(iii) Label		
(iv) Line chart		
(v)		\<start recorder\> Select A3 Formulae = 'A3 + 1' \<stop recorder\>

Question 21 continues on page 10

QUESTION 21 (Continued)   **Marks**

(b)   A spreadsheet is set up to analyse the performance of players in a basketball team.   **6**

	A	B	C	D	E	F	G	H	I	J
1										
2	**Player**				**Game**				**Goals per season**	**Average**
3		**1**	**2**	**3**	**4**	**5**	**6**	**7**		
4	Anna	9	8	8	7	9	1	10	52	7·43
5	Bryn	7	6	6	7	8	3	0	37	5·28571429
6	Chi Fan	3	5	5	3	5	4	3	28	4
7	Darlene	5	6	7	4	6	5	7	40	5·7142857
8	Esther	6	9	12	10	12	14	12	75	10·7143
9	Total per game	30	34	38	31	40	27	32	232	
10										

(i)   A bar chart is to be produced from the spreadsheet. It is to show the **goals per season** for each **player**. Using the axes below, draw and label the chart showing all information that should appear.

QUESTION 21 (Continued)   **Marks**

    (ii)   The number in cell J4 has been correctly formatted. What changes should be applied to cells J5 : J8 so that they have the same format as J4?

          ....

          ....

          ....

    (iii) Name and describe the operation you would perform on the data to rank the players from highest to lowest scorer.

          ....

    (iv) If the number in cell E6 is changed, name all the cells that would be affected by the change.

          ....

QUESTION 21 (Continued)   **Marks**

(c)   The spreadsheet below is used to calculate the money raised from a Save the   **6**
        Whales fun run.

	A	B	C	D	E
1		**SAVE THE**	**WHALES**		
2					
3					
4	**RUNNER**			**TOTAL $**	**PRIZE**
5		**KM RUN**	**NO. SPONSORS**		
6	MELINDA	8	12	$480·00	
7	JACOB	9	15	$675·00	
8	HEATHER	10	7	$350·00	
9	SEAN	10	11	$550·00	
10	EVELYN	7	13	$455·00	
11	TERRY	2	4	$40·00	
12	NINA	9	19	$855·00	
13					
14		**TOTAL MONEY**			
15					
16	**RATE PER**	**KILOMETRE**	**= $5·00**		
17					
18					
19					
20					

   (i)   Write formulas to calculate the following:

         1   highest amount of money raised ....

         2   total number of runners ....

         3   average amount raised ....

         4   total money raised ....

   (ii) A prize of $50 is given only to runners who obtain $500 or more for the
         'Save the Whales' fund. Write a logical function for cell E6 that can be
         copied to cells E7 : E12 which will display in the cells '$50 PRIZE' or
         'NO PRIZE'.

         ....

         ....

1999
HIGHER SCHOOL CERTIFICATE EXAMINATION
COMPUTING STUDIES
2 UNIT GENERAL—SECTION II

QUESTION 22 Databases (16 marks)   **Marks**

Use this database file to answer part (a) and part (b).

A doctor's surgery uses a database to schedule patient appointments and home visits. The schedule file contains the following fields:

- patient_name
- home_address
- new_patient?
- gender
- surgery_or_home_visit
- D.O.B.

- date
- time
- reason_for_visit
- visit_charge
- charge_paid?
- age

(a) Using this file: **4**

    (i) Name a field that could be stored as a logical value.

        ....

    (ii) Name a field that could be stored as a single-character code.

        ....

    (iii) Name a field that could be broken down into TWO smaller fields and suggest names for the new fields.

        Original field ....

        New field 1 ....

        New field 2 ....

    (iv) Name a field that could be stored as a currency value.

        ....

    (v) Name TWO fields that could be combined without loss of data meaning.

        1 ....

        2 ....

Question 22 continues on page 14

QUESTION 22 (Continued)   **Marks**

(b)   (i)   In the space below, design a suitable data input screen for use in entering   **6**
              the data into the schedule file. Your design should follow the principles
              of good design.

```




```

       (ii)   Surgery staff telephone patients to remind them to pay overdue amounts.
              It has been decided that it would be easier to produce a mail merge letter
              for these patients.

              Detail each of the steps to be taken in moving the required data from the
              schedule file to the final printing of the letters.

              ....

              ....

              ....

              ....

              ....

              ....

              ....

              ....

              ....

              ....

QUESTION 22 (Continued)   **Marks**

(c)   The diagram represents a typical telephone bill for a mobile phone.   **6**

Your account number   Date of issue   **OPTRA**
                                                                Communications
4013829   11/02/99

Total of last bill   We received   Balance   Total of this bill

      $9.60 $9.60 $0.00 $5.00   **TOTAL AMOUNT PAYABLE**

                                                               $5·00

                                                               PAYMENT TO BE MADE BY

Mr Bob Biker   DIGITAL ☒   27 / 02 / 99
11 Harbour Side Ave   ANALOGUE ☐
Quay Town 0231

DIAGRAM 1

(i)   In the table below, define four fields, with different data types, that the
       OPTRA Communications Company have used in their database.

	Field	*Data type*
1		
2		
3		
4		

QUESTION 22 (Continued) **Marks**

(ii) What procedure would you use to select records based on customers who have not paid their last bill?

....

....

....

(iii) Which field could be used as the primary key?

....

....

....

STUDENT NUMBER

1999
HIGHER SCHOOL CERTIFICATE EXAMINATION
COMPUTING STUDIES
2 UNIT GENERAL—SECTION II

CENTRE NUMBER

QUESTION 23 Graphics (16 marks)   **Marks**

(a)   Choose terms from the following list that match the definitions in the table   **5**
       below. Write the terms in the spaces provided in the table below.

anti-aliasing	delta information	frame buffer	pixel averaging
bit-mapped	dithering	interlacing	resolution
cropping	distorting	palette	time code
composite video	frame	pixel	warp

Term	Definition
1	The method whereby each pixel represents the average number of colours that would be present in the physical area covered by the pixel.
2	The set of colours available for selection to display a pixel.
3	A section of memory used to store the data for the current image being displayed.
4	A component of output in graphics intended to be displayed as an entity to the screen.
5	The removal of jaggies in a computer image caused by the physical size and shape of the pixel.
6	To display an image by generating alternate lines of the picture in two passes.
7	A correspondence between memory locations and elements of the output pattern on various output devices.
8	A numbering system for identifying individual frames in a video sequence or film.
9	The use of a pattern of varying colours where the eye performs the averaging to produce the required colour.
10	A measurement of the clarity of an image.

526

QUESTION 23 (Continued)   **Marks**

(b)   In the four images below a computer animated technique has been used to   **7**
       transform a ball into a boat.
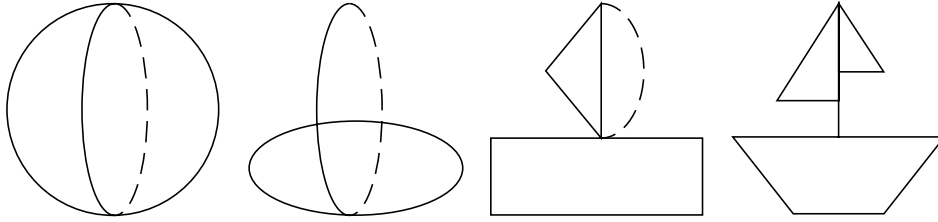
       (i)   Name this technique.

              ....

       (ii)   Explain the above technique.

              ....

              ....

              ....

              ....

              ....

       (iii) 1   Describe the technique of path-based animation.

                   ....

                   ....

                   ....

                   ....

              2   Give an example of its use.

                   ....

                   ....

QUESTION 23 (Continued)   **Marks**

  (iv)   Name the technique used to produce the following special effects.

1 ....

2 ....

3 ....

4 ....
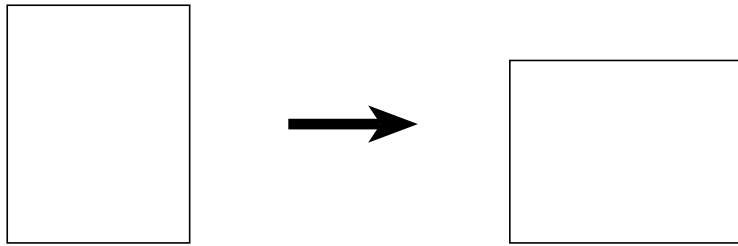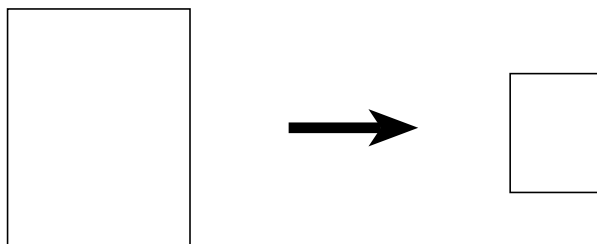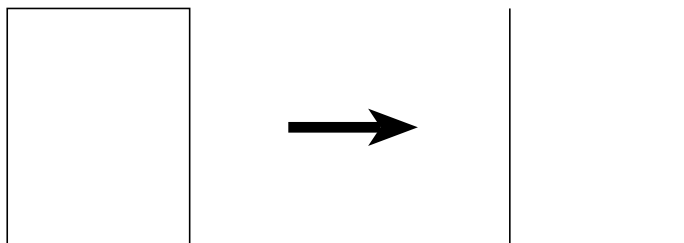
QUESTION 23 (Continued)   **Marks**

(c)   (i)   Name TWO methods you could use   **4**
             to directly convert the diagram on the
             right into a digital form that could be
             used by a software package.

             1 ....

             ....

             2 ....

             ....

       (ii) Select ONE method named above and describe how the diagram is
             converted into a digital form.

             ....

             ....

             ....

             ....

             ....

       (iii) You want to edit the diagram to remove the hat. What difficulties would
             you face if your software package was:

             1   bit-mapped (paint)?
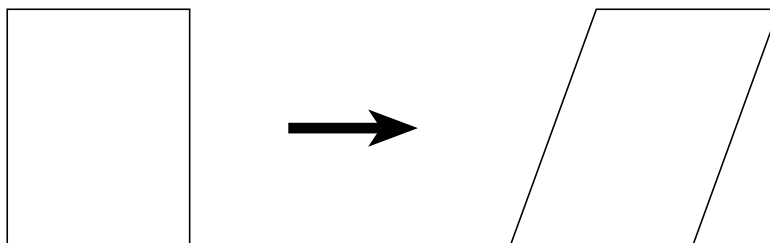
                  ....

                  ....

                  ....

             2   vector-based (draw)?

                  ....

                  ....

                  ....

STUDENT NUMBER

1999
HIGHER SCHOOL CERTIFICATE EXAMINATION
COMPUTING STUDIES
2 UNIT GENERAL—SECTION II

CENTRE NUMBER

QUESTION 24 Desktop Publishing (16 marks)   **Marks**

(a)   Choose terms from the following list that match the definitions in the table   **5**
       below. Write the terms in the spaces provided in the table below.

callout	gutter	leading	template
caption	header	margin	type style
clipboard	justification	master	wordwrap
drop cap	kerning	point size	

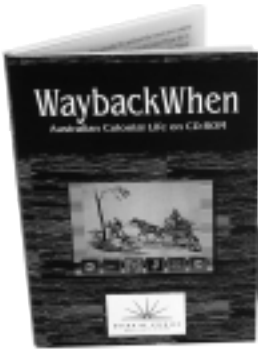| Term	Definition
1	A short quote taken from the body of the copy and printed large in the column, designed to entice the reader.
2	Adjustment of space between lines of text.
3	A text entry feature that automatically advances characters that will not fit at the end of a line, to the beginning of the next line.
4	A space on the inside edge of the page, additional to the margin, provided for binding.
5	Positioning words so that vertical alignments are produced on either or both ends of lines of text.
6	A document that is created for repeated use.
7	The distance between the boundaries of a page and the area where the text and graphics appear.
8	The typesetting practice of closing the horizontal space between some letter combinations to achieve a better fit.
9	A layout of relative size and positions of components on a page, used as a guide for the layout of every page.
10	A temporary file to hold a piece of text or graphics.

527

QUESTION 24 (Continued)   **Marks**

(b)   Below is a page from a desktop publication.   **6**
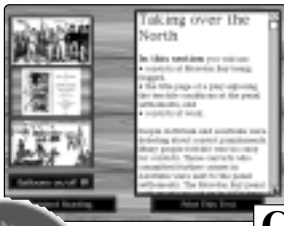
A COMPUTER RESOURCES

WaybackWhen: An Interactive Multimedia Look at Everyday Life in Colonial Australia

Years 4–8   Price $80

Through photographs, etchings, cartoons, letters, diaries, speeches, poems and songs, students can explore work and play in 19th century Australia. *WaybackWhen* provides interesting glimpses, in colour and sound, of everyday life in colonial Australia. A classroom resource for Human Society and Its Environment.

G

ISBN 0 7310 2516 4
Contents: CD-ROM (Mac only), installation guide, instructions
Minimum system requirements: Macintosh System 7, Quicktime installed

E

C

FlashBACK: Interactive Australian History

Years 5–10   Price $80

FlashBACK contains many elements of Australian history, including newsreel footage of migrants arriving in Australia and the Cold War. It integrates the material into lesson-sized sequences to support the History Years 7–10 Syllabus, as well as the Modern History, Australian Studies and General Studies courses. (Also relevant for Years 5–6.)

ISBN 0 7310 0059 5
Contents: CD-ROM (Mac only), 86 pp user manual, installation instructions
Minimum system requirements: Macintosh System 7, 4 MB RAM

H **HSC**

1995/1996/1997 HSC Examination Papers and Selected HSC Examination Reports on CD-ROM

Price $25

Contents examination papers from 1995, 1996 and 1997 HSC examinations, covering all subjects except those languages with non-Romanic scripts or subjects with small candidatures. Does not include HSC Geography broadsheets, which are available in **F** copy (see page 11). All exam reports for 1995 and 1996 are included, as well as the enhanced exam reports for 1997.

Contents: CD-ROM (Mac and Windows), installation instructions
Minimum system requirements: PC – Windows 3.1, 8 MB RAM, 2x CD-ROM drive;
Macintosh – System 7.1, 8 MB RAM, 2x CD-ROM drive

D

QUESTION 24 (Continued)   **Marks**

  (i) Using the letters A–H given on the previous page, identify the following
      page layout or publication components listed 1–8.

      1   column text   ....

      2   graphics   ....

      3   subheading   ....

      4   banner heading   ....

      5   text enhancement   ....

      6   footer   ....

      7   white space   ....

      8   text-wrap   ....

  (ii) Describe a way a 10% increase in price for all products could be
      integrated automatically in this publication.

      ....

      ....

      ....

      ....

  (iii) *Italics* and **bold** relate to the appearance of text. Explain the difference.

      ....

      ....

      ....

      ....

QUESTION 24 (Continued)   **Marks**

(c)   A desktop-publishing business wishes to purchase a number of new printers to   **5**
       use in the production of documents for clients. They have prepared a short list of four
       printers given in the table below.

TYPE	**Diskjet 340 Inkjet**	**Diskjet 920c Inkjet**	**Blazer 1500 Laser**	**Blazer 9000c Laser**
COLOUR	No	Yes	No	Yes
RESOLUTION				
—Black	600 × 300 dpi	600 × 600 dpi	1200 × 1200 dpi	1200 × 1200 dpi
—Colour	N/A	600 × 600 dpi	N/A	1200 × 1200 dpi
SPEED				
—Black	3 ppm	10 ppm	16 ppm	24 ppm
—Colour	N/A	6 ppm	N/A	10 ppm
PHOTO QUALITY	No	Yes	Yes	Yes
MEMORY	No	2 Mb	4 Mb	32 Mb
EXPANDABLE	No	No	No	Yes
PRICE	$249	$760	$1295	$8235

   (i)   Describe TWO advantages in having a large memory capacity in a
          printer.

          1   ....

                 ....

          2   ....

                 ....

   (ii)   The colour laser printer is more expensive than the colour inkjet printer.
          Give TWO reasons to justify the purchase of a colour laser printer.

          1   ....

                 ....

          2   ....

                 ....

   (iii) 1   Which of the four printers in the table above would be most
               appropriate for early pre-press work?

               ....

          2   Give ONE reason to justify your choice.

               ....

               ....

1999
HIGHER SCHOOL CERTIFICATE EXAMINATION
COMPUTING STUDIES
2 UNIT GENERAL—SECTION II

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

(a)   (i)   Choose terms from the following list that match the definitions in the   **5**
              table below. Write the terms in the spaces provided in the table below.

asynchronous	half-duplex	parity bit	simplex
bit-rate	LAN	protocol	synchronous
baud rate	network	ring	V.42 bis
full-duplex	parallel	serial	WAN

Term	Definition
1	A localised computer network typically within a building or campus.
2	A set of rules that governs the transmission of data between computers.
3	Transmission of data in one direction only.
4	A computer network covering an extensive area such as a country.
5	Communication in which both computers can transmit to each other at the same time.
6	Both transmitting and receiving computers process transmitted data at the same rate.
7	Data is sent using start and stop bits without regard to keeping in time with the other computer.
8	A two-way communication channel in one direction at a time.
9	The speed with which data can be transmitted or received.
10	The extra *bit* used to check the accuracy of the received item.

QUESTION 25 (Continued)   **Marks**

(b)   (i)   What is *electronic mail* or *email*?   **6**

....

....

....

        (ii)   Name ONE advantage of email over the traditional postal mail system.

....

....

....

        (iii) Name ONE disadvantage of email.

....

....

....

        (iv)   What is *data compression*?

....

....

....

        (v)   Give a reason for using data compression.

....

....

....

        (vi)   What is a *bulletin board*?

....

....

....26................................

QUESTION 25 (Continued)   **Marks**

(vii)   A group of 8 bits 11010100 is transmitted.

   1   Complete Diagram 1 to show the bit stream being sent in parallel
       transmission.

```
┌──────────┐                              ┌──────────┐
│ S        │                              │ R        │
│ E        │                              │ E        │
│ N        │                              │ C        │
│ D        │                              │ E        │
│ E        │                              │ I        │
│ R        │                              │ V        │
│          │                              │ E        │
│          │                              │ R        │
│          │                              │          │
└──────────┘                              └──────────┘
```
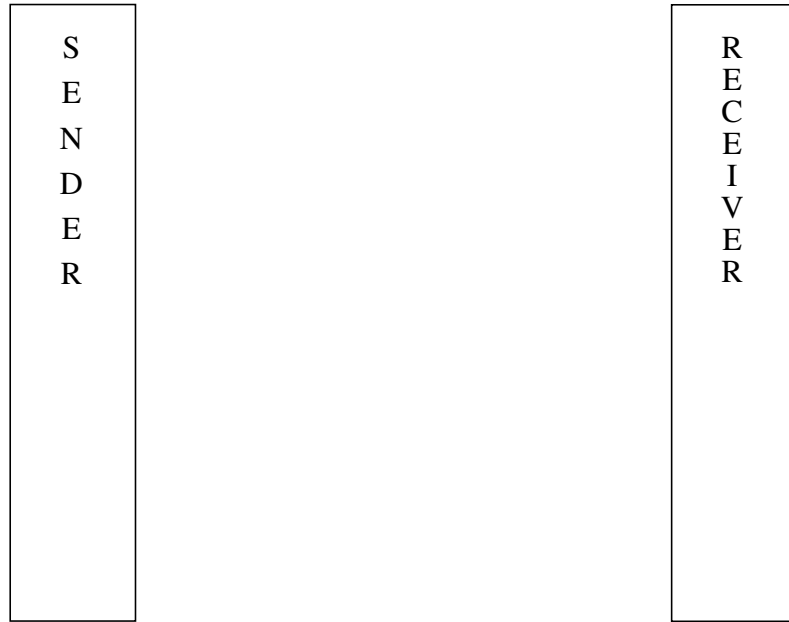
DIAGRAM 1

   2   Complete Diagram 2 to show the bit stream being sent by serial
       transmission.

```
┌──────────┐                              ┌──────────┐
│ S        │                              │ R        │
│ E        │                              │ E        │
│ N        │                              │ C        │
│ D        │                              │ E        │
│ E        │                              │ I        │
│ R        │                              │ V        │
│          │                              │ E        │
│          │                              │ R        │
│          │                              │          │
└──────────┘                              └──────────┘
```

DIAGRAM 2

Question 25 continues on page 28

QUESTION 25 (Continued)   **Marks**

(c)   (i)   Draw a diagram showing a bus network.   **5**

KEY	Server: ■	Terminals: ●	Cable: ——

(ii)   Describe the use of a gateway in LANs.

....

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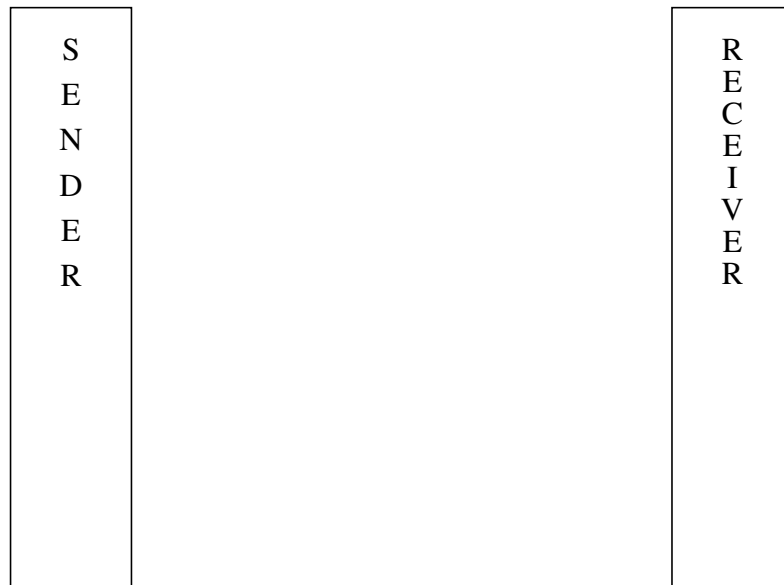...

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(iii) Give ONE example for each of the following communication channels.

1   simplex ....

2   half-duplex ....

3   full-duplex ....

(iv)   With reference to a modem, explain the difference between modulation
       and demodulation.

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End of paper