



HIGHER SCHOOL CERTIFICATE EXAMINATION

1996

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

(20 Marks)

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 THIS SPREADSHEET EXTRACT TO ANSWER QUESTIONS 1 TO 3.

	A	B	C	D
1		PAY FOR PICKERS		
2	Hourly rate			
3	Pickers	Hours worked	Wage	Bonus?
4	M. Jones			
5	G. Samson			
6	T. Tran			

1. This spreadsheet calculates the pay for berry pickers. The hourly rate for all pickers is entered into cell B2. The cell C4 is to be copied down column C for the remaining pickers.

The correct formula for C4 is

- (A) = B2 * B4
 (B) = \$B2 * B4
 (C) = \$B\$2 * B4
 (D) = B2 * \$B\$4
2. The copying of cell C4 down column C will only be successful with the use of
- (A) a macro and range name.
 (B) a logical address and relative address.
 (C) a relative address and absolute address.
 (D) an absolute address and logical address.
3. A bonus is given to any worker who works more than 36 hours in the week. The correct formula for cell D4 that will correctly state 'Yes' or 'No' is
- (A) = IF (B4 ≥ 36, "Yes", "No")
 (B) = IF (B4 > 36, "No", "Yes")
 (C) = IF (B4 ≤ 36, "Yes", "No")
 (D) = IF (B4 ≤ 36, "No", "Yes")

4. A spreadsheet label is
- (A) additional information stored in a cell that is visible only when especially requested.
 - (B) data entered into a spreadsheet cell to provide some explanation of part of the spreadsheet.
 - (C) a heading at the top of a column, and the left of a row, that allows a cell to be cross-referenced.
 - (D) a tag associated with a cell to allow the cell to be referenced by name, rather than by row and column.
5. A large music collection has been catalogued on cards. The data on the cards is to be put into an electronic database. The data from each card would be entered as a
- (A) cell.
 - (B) field.
 - (C) file.
 - (D) record.
6. The primary key of a database
- (A) must be unique.
 - (B) must be a single field.
 - (C) identifies records having a required value.
 - (D) is the field on which the database is indexed.
7. The secondary key of a database
- (A) must be unique.
 - (B) must be a single field.
 - (C) identifies records having a required value.
 - (D) is the field on which the database is indexed.
8. A 'repeater' is a device that
- (A) analyses loops in program code.
 - (B) amplifies and outputs a received signal.
 - (C) duplicates signals by producing two output signals for each input signal.
 - (D) receives signals from one computer, and individually copies them to all other computers on the network.

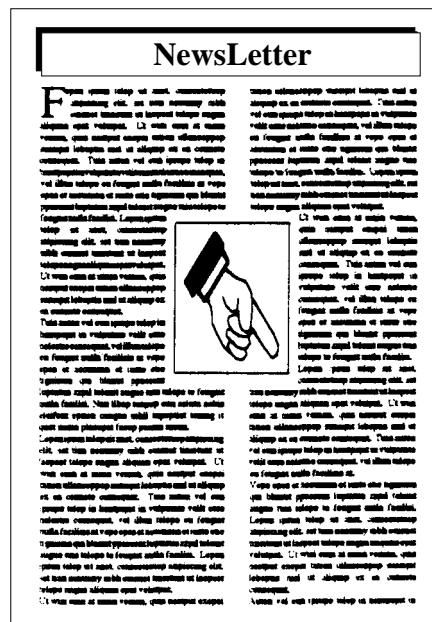
9. An example of simplex communication is
- (A) a live political debate.
 - (B) a television broadcast.
 - (C) a phone conversation.
 - (D) an automatic teller transaction.
10. How many colours can be supported in a frame buffer using a colour depth of 3?
- (A) 3
 - (B) 4
 - (C) 8
 - (D) 16
11. To produce animation of a jumping stick-figure, the following starting and terminating images are created.



The animation technique that automatically generates the intermediate images between the two is called

- (A) tweening.
 - (B) interlacing.
 - (C) pixel averaging.
 - (D) sprite animation.
12. The set of colours available for selection to display at a pixel is the
- (A) palette.
 - (B) screen resolution.
 - (C) HLS information.
 - (D) RGB information.

USE THIS REPRODUCTION OF A NEWSLETTER TO ANSWER QUESTIONS 13 TO 15.



13. The text on the newsletter has been
- (A) resized around the graphic.
 - (B) dropped around the graphic.
 - (C) cropped around the graphic.
 - (D) wrapped around the graphic.
14. The letter F at the start of the first column is an example of
- (A) sized text.
 - (B) a drop cap.
 - (C) a graphic letter.
 - (D) a principal font.
15. The text in the columns is
- (A) centred.
 - (B) a template.
 - (C) left aligned.
 - (D) fully justified.

16. A computer screen is described as having '640 × 480 pixels'. This is a description of
- (A) bit-map value.
 - (B) pixel averaging.
 - (C) screen elements.
 - (D) screen resolution.
17. In desktop publishing, *Helvetica*, Times, and Courier are examples of
- (A) layout.
 - (B) type face.
 - (C) type style.
 - (D) text mode.
18. A temporary file to hold a piece of text or graphics to allow transfer between applications or windows is a
- (A) filter.
 - (B) clipboard.
 - (C) cut-and-paste interface.
 - (D) data interchange format.
19. The following seven-bit character and parity bit were transmitted:

Character	Parity
0 1 0 0 0 1 0	1

They were received as:

Character	Parity
1 1 0 0 0 1 1	1

Which of the following statements is true?

- (A) They were sent as odd parity, and interpreted by the receiver as correct.
- (B) They were sent as odd parity, and interpreted by the receiver as incorrect.
- (C) They were sent as even parity, and interpreted by the receiver as correct.
- (D) They were sent as even parity, and interpreted by the receiver as incorrect.

- 20.** A type of transmission in which data bits are sent one at a time, and in sequence, is called
- (A) serial transmission.
 - (B) parallel transmission.
 - (C) ordered data transmission.
 - (D) half-duplex mode transmission.

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EXAMINER'S USE ONLY

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SECTION II**Marks**

(80 Marks)

QUESTION 21. Spreadsheets (16 marks)

(a) Explain the following concepts as they apply to spreadsheets.

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(i) Cell pointer

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(ii) 'What-if' prediction

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(iii) Model

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(iv) Dynamic link

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(v) File conversion

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QUESTION 21. (Continued)

Marks

- (b) (i) Three commonly used *chart types* are: bar, line, and pie. Against each *Use* below, write the name of the chart type that is most appropriate. **5**

<i>Use</i>	<i>Chart type</i>
A sales representative wishes to inform clients of the current trends in the marketplace.	
An advertiser wishes to display the proportion of the population using a product.	
A scientist wishes to compare the growth rate of bacteria at many different temperatures.	
A news program wishes to compare the percentage of unemployment in each state.	

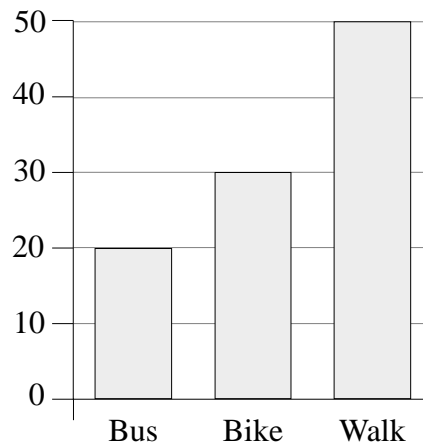
- (ii) A circular reference can prevent a spreadsheet from producing desired results. Give an example of a circular reference, by entering formulae in the grid below.

	A	B	C	D
1				
2				
3				
4				

QUESTION 21. (Continued)

Marks

- (iii) The chart below shows the number of students who get to school by catching a bus, riding a bike, or walking.



In the grid below, enter the data and labels that could be used to generate the above chart.

	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					

- (iv) Give TWO examples of a built-in function in a spreadsheet you are familiar with.

1.

2.

QUESTION 21. (Continued)

Please turn this paper sideways to answer part (c).

Marks**6**

(c) At a monthly market, a stall-holder sells home-made cakes. The spreadsheet template on page 13 is used to help calculate the expected profit. The following data is to be entered.

- The number of cakes to be made is entered into cell E2.
- The unit cost of each ingredient is entered into cells C5 to C8.
- The selling price of one cake is entered into cell D11.

The spreadsheet then calculates the cost of the ingredients for each cake in cells D5 to D8, the total cost of each cake in cell D10, and the profit on each cake in cell D12.

(i) On the template, enter the formula that is required in the cells D5, D10, and D12.

(ii) An area is required in columns E and F that could be used to calculate the quantity and cost of ingredients needed for all cakes. On the template, enter appropriate labels in row 4, and enter formulae in cells E5 and F5 that could be copied down for the other ingredients.

(iii) At the end of the day, the number of cakes sold is entered in cell D14. Write a formula in cell D15 that would calculate the profit or loss for the day.

(iv) Give ONE example of a 'what-if' calculation that could be performed using this spreadsheet.

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QUESTION 21. (Continued)

	A	B	C	D	E	F
1	CALCULATION OF COST OF CAKES					
2				Number of cakes to make		
3						
4	<i>Ingredient</i>	<i>Units per cake</i>	<i>Price per unit (\$)</i>	<i>Cost per cake (\$)</i>		
5	Flour (kg)	0.45				
6	Eggs	2				
7	Sugar (kg)	0.30				
8	Cream (L)	0.25				
9						
10			Cost (\$)			
11			Selling price (\$)			
12			Profit (\$)			
13						
14			Number of cakes sold			
15			Actual profit or loss			
16						
17						
18						

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

USE THE FOLLOWING INFORMATION TO ANSWER PARTS (a), (b), AND (c).

A town library uses a database to store information on books, borrowers, staff, loans, etc.

The library has the following rules:

- there are two types of borrower—ADULT and CHILD;
- borrowers are fined for each book that is overdue. The fine is 25 cents per day for each overdue book;
- borrowers are not allowed to borrow books if they have any unpaid fines.

The borrower file contains the following fields:

- | | |
|-------------------|----------------------------|
| • borrower_number | • borrower_type |
| • first_name | • number_of_books_on_loan |
| • last_name | • allowed_to_borrow_books? |
| • home_address | • unpaid_fines_amount |

(a) Using this file:

5

- (i) name a field that should be stored as an integer;

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- (ii) name a field that should be stored as a currency value;

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- (iii) name a field that could be stored as a logical value;

.....

- (iv) name a field that could be stored as a single-character code;

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QUESTION 22. (Continued)

Marks

- (v) name a field whose value could be determined from the values in other fields of the record;

.....

- (vi) name a field that could be broken down into THREE smaller fields, and suggest names for those new fields.

Original field

New field 1

New field 2

New field 3

- (b) A report is to be produced listing all adults with outstanding fines of over \$20, or children with outstanding fines of over \$16. The report is to show the borrower name, unpaid fines, and borrower type.

6

- (i) Write a search specification that would find the required records.

.....

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QUESTION 22. (Continued)

Marks

- (ii) The following sample shows the first two pages of the report. Several lines have been omitted from the middle of each page for space reasons.

DATE 6 JUNE 1996		
TYPE	FINES	NAME
ADULT	\$31	WILLIAM MOORE
CHILD	\$25.5	MARGARET DEE
CHILD	\$328	CONNIE YEE
~~~~~		
ADULT	\$29	JAMES COOK
PAGE	1	

DATE 6 JUNE 1996		
ADULT	\$32	JULIE DREW
CHILD	\$34	CHRISTOPHER LO
CHILD	\$17	LEE CAMILLIERI
~~~~~		
ADULT	\$30	BEATRICE WILLIA
PAGE	2	

There are a number of deficiencies in the *layout* of this report. Identify FOUR of them.

1.
2.
3.
4.

- (iii) It has been decided that the report should appear sorted on `borrower_type` (in ascending order), followed by `unpaid_fines_amount` (in descending order). After this sort, which of the eight records shown in the above sample report would appear first?

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QUESTION 22. (Continued)

Marks

- (c) As part of the library's monthly report, a chart is required showing the proportion of child members who, at the end of each month, have: **5**

- no books on loan;
- from one to five books on loan;
- over five books on loan.

In order to produce this chart:

- appropriate data needs to be extracted from the database;
- the data needs to be placed in a spreadsheet;
- a chart needs to be produced in the spreadsheet;
- the chart needs to be moved to the word-processed report.

- (i) Using the features in your database, describe the tasks you would perform to find the data and to prepare it for transfer to the spreadsheet.

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- (ii) Cut-and-paste is one way to move data between applications. For each of the following, name *another* method to import the data, and explain your choice.

1. From database into spreadsheet

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2. From spreadsheet into word processor

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

- (a) (i) Name TWO common formats for the storage of graphical data. **5**

1.

2.

- (ii) Name a factor that affects the number of colours able to be displayed on a screen, and explain how it does so.

Factor

Explanation

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.....

- (iii) Scanners are frequently used in creating computer graphics. Describe the process of scanning.

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- (iv) State TWO differences between bit-mapped graphics and vector graphics.

1.

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2.

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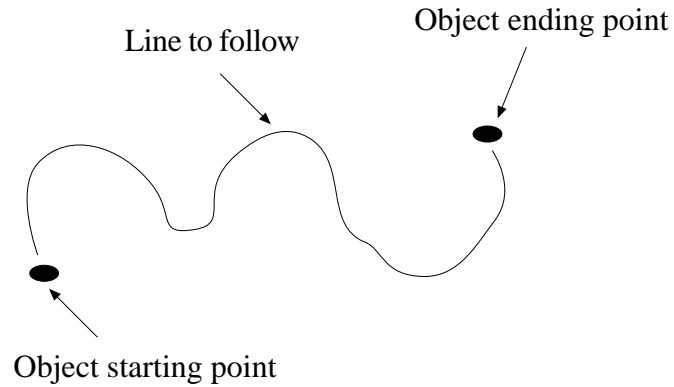
Question 23 continues on page 22

QUESTION 23. (Continued)

Marks

(b) (i)

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Name the type of animation that uses the concepts indicated above and describe TWO limitations of this type of animation.

Name

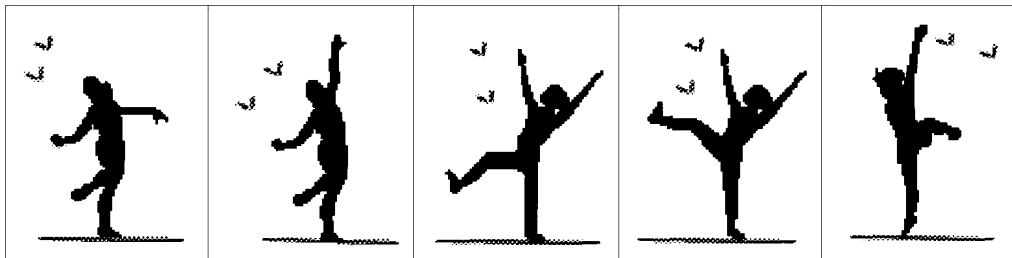
1.

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2.

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Parts (ii) and (iii) refer to the following five frames of animation.



(ii) Name the type of animation, and justify your answer.

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QUESTION 23 . (Continued)

Marks

- (iii) The creator of the above animation initially had the speed at six frames per second.

1. Describe how this animation would have appeared.

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2. How would you improve it?

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- (c) (i) A newspaper reporter uses images in graphics libraries, or downloaded from other sources. The reporter edits them to illustrate current articles.

6

Briefly discuss THREE issues (ethical or social) related to this activity.

1.

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2.

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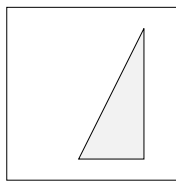
3.

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QUESTION 23. (Continued)

Marks



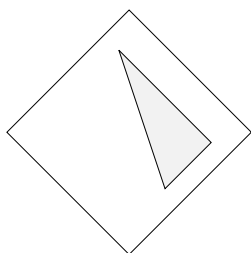
- (ii) Each of the following images involves changes from the above image. Name each change.

1.



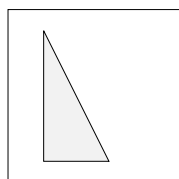
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2.



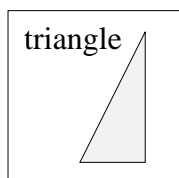
.....

3.



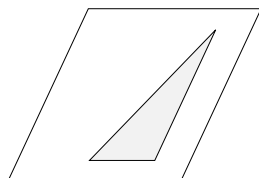
.....

4.



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5.



.....

6.



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

- (a) (i) 'Bold' and 'italics' relate to the appearance of text. Explain the difference. **5**

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- (ii) 'Leading' and 'kerning' relate to spacing. Explain the difference.

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- (iii) 'Portrait' and 'landscape' relate to orientation. Explain the difference.

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- (iv) 'Footer' and 'footnote' relate to extra information on a page. Explain the difference.

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- (v) 'Master page' and 'template' relate to the standardising of layout. Explain the difference.

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Question 24 continues on page 26

QUESTION 24. (Continued)

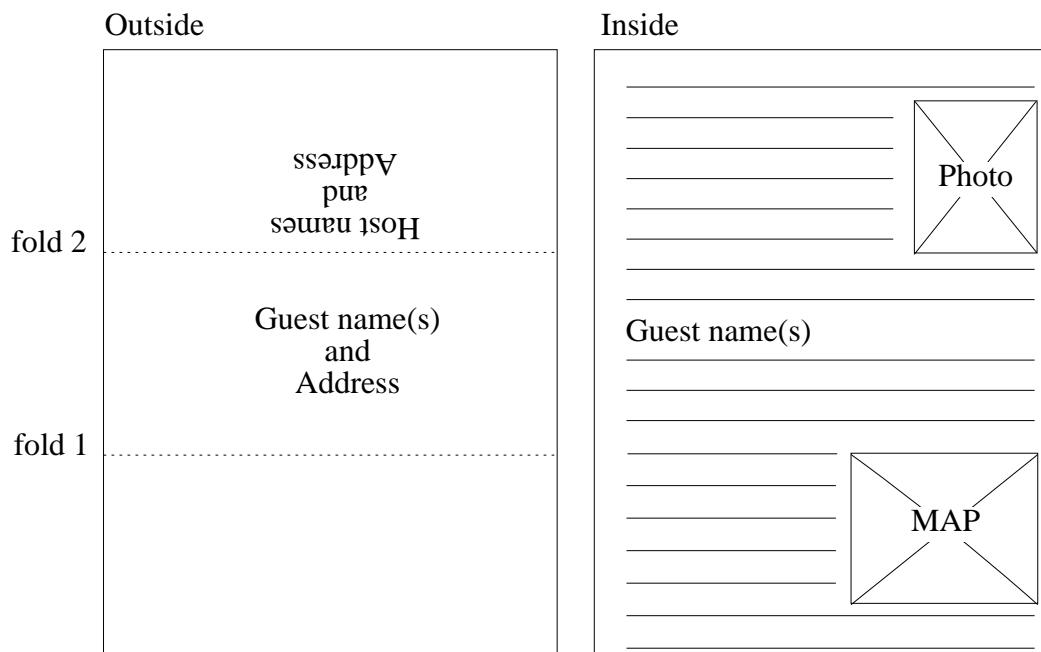
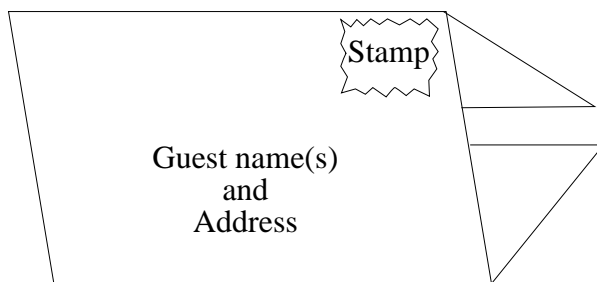
Marks

USE THE FOLLOWING INFORMATION AND DIAGRAM TO ANSWER PARTS (b) AND (c).

You are asked by friends to desktop-publish their wedding invitation.

They would like to include the following features in a three-fold invitation letter as shown in the diagram below:

- the name(s) and address of the invited guest(s);
- the names and address of the hosts;
- a map scanned from a street directory;
- their photo.



QUESTION 24. (Continued)

Marks

- (b) There are a number of features that must be considered when laying out the pages of this wedding invitation. These include: **6**

- text placement;
- text enhancement;
- graphics.

For each of these, describe TWO issues that you would need to consider.

(i) Text placement

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.....

.....

(ii) Text enhancement

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.....

(iii) Graphics

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QUESTION 24. (Continued)

Marks

- (c) (i) How could you ensure that you could legally use the map?

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- (ii) Describe TWO production considerations you would face in:

1. mail merging the guests' postal addresses and ensuring that the guests' names are printed correctly on both sides;

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.....

2. incorporating the photograph of the bride and groom.

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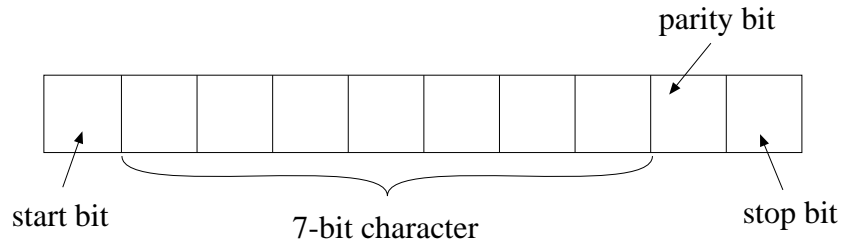
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QUESTION 25. Computer Communications (16 marks)**Marks**

(a) (i)

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1. The above diagram indicates asynchronous communication. Explain why.

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2. Draw a diagram to represent synchronous communication.

3. Describe ONE factor that might cause the number of characters received to differ from the number of characters transmitted in synchronous communication.

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QUESTION 25. (Continued)

Marks

- (ii) You have information to send to a number of people. Give ONE circumstance under which it would be best to use the following media?

Australia Post

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Electronic mail

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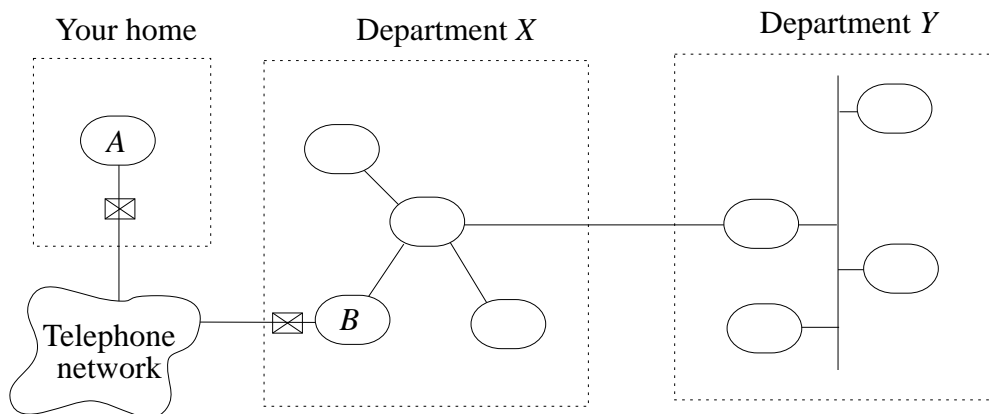
.....

A message area on a bulletin board

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- (b) In the following diagram, computer *A* (at your home) and computer *B* (in Department *X*) can establish communication connections through the telephone network. Departments *X* and *Y* are linked by a direct line.

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QUESTION 25. (Continued)

Marks

- (i) Name the LAN topology used in Department *X*.

.....

- (ii) Name the LAN topology used in Department *Y*.

.....

- (iii) In connecting to the telephone network, computers *A* and *B* each use a device (marked ☒).

What are these devices called?

.....

- (iv) The distance between your home and Department *X* is such that phone calls are expensive.

Give THREE ways to minimise the cost of downloading a large file from computer *B* to your home computer.

1.

.....

2.

.....

3.

.....

- (v) Given that computer *B* is connected to the public telephone network, describe TWO security measures that might need to be incorporated.

1.

.....

2.

.....

QUESTION 25. (Continued)

Marks

- (c) (i) Describe the basic principles that underlie all file transfer protocols, such as X modem or Z modem. **6**

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.....

- (ii) Describe the principles underlying data compression techniques.

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- (iii) Give ONE example of a commonly used data compression software package, and ONE example of a commonly used data compression hardware technique.

Software

Hardware

- (iv) Compression of data for transmission over a network can be carried out using either hardware or software. For each, give ONE advantage that it has over the other.

Advantage of software

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Advantage of hardware

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