BOARD OF STUDIES
NEW SOUTH WALES

HIGHER SCHOOL CERTIFICATE EXAMINATION

1997

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.

The spreadsheet below stores the marks gained by students in two tests, and calculates an average mark and grade for each student.

	A	B	C	D	E	F	G
1	MARKS FOR CLASS TESTS						
2	**Given name**	**Surname**	**Test 1**	**Test 2**	**Average**	**Grade**	
3	Jamal	El Vaq	8	7	7·5		
4	John	Jones	3	1	2		
5	Elizabeth	Black	7	3	5		
6	Michael	Ng	9	8	8·5		
7							

1 . In the above spreadsheet, a column in the calculation area is

(A) column A.
(B) column C.
(C) column E.
(D) column G.

2 . The grade for each student is based on their average for the two tests as follows:

- A for averages of 5 or above;
- B for averages of less than 5.

A correct formula for cell F3 is

(A) = IF (E3 ≥ 5, "B", "A")
(B) = IF (E3 ≥ 5, "A", "B")
(C) = IF (E3 ≤ 5, "B", "A")
(D) = IF (E3 ≤ 5, "A", "B")

3 . A graph is to be generated of the average marks of each student. Which would be the most suitable graph type to *compare* these average marks?

(A) Pie

(B) Line

(C) Column

(D) Combination

4 . A spreadsheet that uses the results of several other spreadsheet calculations is called a

(A) macro spreadsheet.

(B) what-if spreadsheet.

(C) consolidated spreadsheet.

(D) file-converted spreadsheet.

5 . The database feature that can rearrange data in alphabetical order is called

(A) sorting.

(B) copying.

(C) organising.

(D) mail-merging.

6 . A business has created a database of clients in Australia. The conditional part of a query to retrieve all clients from Tasmania who are over twenty-five years of age is

(A) WHERE STATE = "TASMANIA" OR AGE < 25.

(B) WHERE STATE = "TASMANIA" OR AGE > 25.

(C) WHERE STATE = "TASMANIA" AND AGE < 25.

(D) WHERE STATE = "TASMANIA" AND AGE > 25.

7 . A database field holding a unique value, such as a borrower identification number, is known as a

(A) master key.

(B) primary key.

(C) relational key.

(D) secondary key.

8. Information in a telephone directory may include surname, initials, address, and telephone number. All of this information about ONE person is an example of a

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

9. A mode of communication between computers in which both computers can transmit to each other at the same time is known as

(A) half-duplex.
(B) full-duplex.
(C) half-simplex.
(D) full-simplex.

10. Data transmission speed is measured in *bps*. This is the abbreviation for

(A) bits per second.
(B) bytes per second.
(C) blocks per second.
(D) buffers per second.

11. The communication method that transmits *start* and *stop* bits with each character is known as

(A) synchronous.
(B) asynchronous.
(C) simplex mode.
(D) full-duplex mode.

12. The following seven-bit ASCII character and parity bit were transmitted as

ASCII character	Parity
1 0 1 1 0 1 0	0

They were received as:

ASCII character	Parity
1 0 1 0 0 1 0	0

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*.

13.

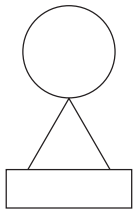


FIG. 1

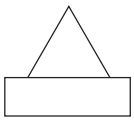


FIG. 2

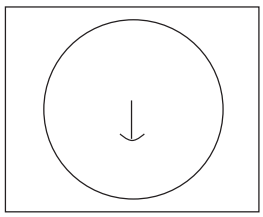
What process was used to change the graphic in Figure 1 to that in Figure 2?

(A) Cropping
(B) Mirroring
(C) Resizing
(D) Scaling

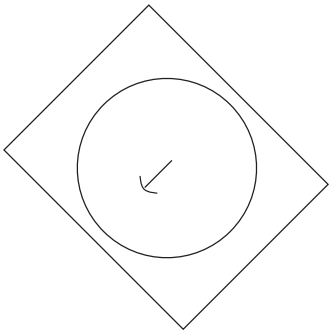
14. An original animation that shows the movement of a chess piece along a *defined* straight line on a fixed chessboard background, is an example of

(A) warping.
(B) morphing.
(C) cel-based animation.
(D) path-based animation.

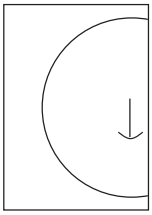
15. Which of the following alternatives best demonstrates ‘distortion’ of this image?



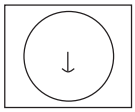
(A)



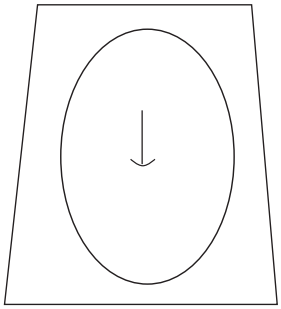
(B)



(C)



(D)



16. Screen resolution is usually measured in terms of the

(A) size of the screen measured diagonally.
(B) amount of memory required for the frame buffer.
(C) number of horizontal and vertical pixels on the screen.
(D) maximum number of characters that can appear on the screen.

17. In desktop publishing, the term ‘leading’ refers to the

(A) adjustment of space between letters.
(B) adjustment of space between lines of text.
(C) automatic change of font throughout the publication.
(D) automatic change of margins throughout the publication.

18. In desktop publishing, the term ‘justification’ refers to the

(A) style of the text chosen.
(B) reason for borders or margins.
(C) exact placement of a text-box on a page.
(D) alignment of the text on a page or in a text-box.

19. In desktop publishing, shadow, *italic* and <u>underline</u> are examples of

(A) type styles.
(B) font graphics.
(C) letter graphics.
(D) text justification.

20. In desktop publishing, the term ‘graphic’ refers to

(A) the file holding the artwork.
(B) a detailed account of an incident.
(C) a picture, diagram, or chart used to support the text.
(D) the artistic or pictorial form of text used in a publication.

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SECTION II

(80 Marks)

Marks

QUESTION 21. Spreadsheets (16 marks)

(a) Explain the following concepts as they apply to spreadsheets. **5**

(i) Column ……

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(ii) Template ……

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(iii) Macro ……

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(iv) Absolute cell address ……

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(v) Data interchange format ……

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Question 21 continues on page 10

Marks

(b) A spreadsheet is set up to calculate the cost of photocopying paper for departments in an organisation. A portion of the spreadsheet appears below. The cost of copying onto one side of a page is \$0·03 per copy, and for copying onto both sides of a page is \$0·05. Each department is allocated a budget of \$20 000 for photocopying. **6**

	A	B	C	D	E	F	G	H
1	**Photocopying at ABC Pty Ltd**							
2			Cost per page in \$					
3			Single side A4	Double side A4				
4			\$0·03	\$0·05				
5	**Department**	**Number of copies (in thousands)**			**Cost**	**Cost**		
6			**Single side**	**Double side**	**Single side**	**Double side**		
7	Sales		150	250	\$4 500·00	\$12 500·00		
8	Finance		300	200		\$10 000·00		
9	Planning		175	270		\$13 500·00		
10	Personnel		250	200		\$10 000·00		
11	Administration		300	205		\$10 250·00		
12								
13								

Marks

The formula, = (C4 ∗ C7) ∗ 1000, in E7 gives a correct result. If this formula is copied to cells E8 through E11 in the spreadsheet, the result in E9 will be incorrect.

(i) Write the formula that will appear in E9, causing this incorrect result.

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(ii) Why does this formula give an incorrect result?

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(iii) Write down the formula for E7 that will ensure a correct result in E9 when a ‘copy down’ process is applied.

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(iv) Each department is given a budget for the amount of photocopying expenditure per year. Explain how the spreadsheet could be adjusted so that a department is aware of how its current total cost compares to its budget of $20 000.

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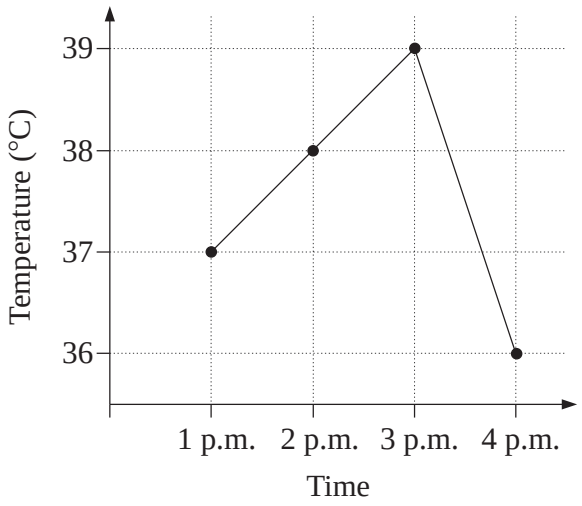
Question 21 continues on page 12

QUESTION 21. (Continued) **Marks**

(c) The chart below shows a hospital patient's temperature recorded over several hours. **5**



(i) 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					

(ii) Write a built-in function relating to the above spreadsheet to indicate the highest temperature of the patient over the three-hour period.

……

(iii) The chart above is to be integrated into a word-processing document. Discuss ONE advantage of using a dynamic link as opposed to a static link to achieve this.

……

……

(iv) State TWO advantages of using electronic spreadsheets, compared to using manual spreadsheets.

1. ……

2. ……

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

(a) (i) What is the difference between *sorting* and *searching* a database? **5**

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(ii) What is the difference between a *database field* and a *database record*?

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(iii) What is *mail-merge*?

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(iv) What is a *distributed database*?

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Question 22 continues on page 14

QUESTION 22. (Continued) **Marks**

(b) A real-estate agency uses an electronic flat-file database to keep information about houses and units it has for sale. An excerpt from this Properties File database appears below. **6**

PROPERTIES FILE

Suburb	*Address*	*House or unit*	*No. of bedrooms*	*Pool?*	*Date listed*	*Price*
Avalon Beach	5 Main St	H	4	NO	03/04/97	$320 000
Epping	4/124 Sydney Rd	U	3	NO	28/02/97	$200 000
Epping	42 Simon Ave	H	3	YES	06/06/97	$242 000
Lindfield	24 Australia St	H	4	YES	14/04/97	$280 000
Pennant Hills	88 Woodlands Rd	H	3	YES	14/04/97	$280 000
Rockdale	3/32 Links Dr	U	2	NO	15/03/97	$150 000

All parts of this question refer to the above database.

(i) State a field that best contains the following data types.

1. Alphanumeric/text ……

2. Logical/Boolean ……

3. Numeric ……

4. Date ……

(ii) A potential customer wishes to purchase a house that has at least three bedrooms and does not have a pool. Write a search specification that would allow a listing of possible houses that meet these criteria.

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QUESTION 22. (Continued) **Marks**

(iii) In the space provided below, create a *form view* showing all of the details of ONE of the properties in the suburb of Epping.

Question 22 continues on page 16

QUESTION 22. (Continued) **Marks**

(c) All parts of this question refer to the database below. **5**

EXECUTIVES FILE

Area of responsibility	*Manager*	*Address*	*Postcode*	*Budget*
Finance	Peter Shellman	615 Albury St Caringbah	2229	$73 000
Training	Holly Twist	135 Trace Rd Canley Vale	2166	$11 250
Sales	Ramora Avandi	2A Shredding Rd Parramatta	2145	$112 000
Marketing	Maria Cordoza	17 Victory Pde Normanhurst	2118	$56 000

(i) How many records are there in the Executives File? ……

(ii) How many fields are there in the Executives File? ……

(iii) It has been decided that the Executives File should appear sorted on *Manager* (in descending order). After this sort, who would appear first?

……

(iv) The *Manager* sort produces a result inconsistent with other personnel files sorted by *surnames*. Explain how you could modify the Executives File's structure to achieve consistency.

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(v) The manager names are to be transferred from the Executives File to a spreadsheet. TWO methods of doing this are by use of the clipboard and by file transfer. Describe each of these methods.

Clipboard ……

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File transfer ……

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

(a) Explain the following terms as they relate to computer graphics. **5**

(i) Pixel ……

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(ii) Cel ……

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(iii) Cross-fade ……

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(iv) Frame buffer ……

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(v) Anti-aliasing ……

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Question 23 continues on page 18

QUESTION 23. (Continued) **Marks**

(b) (i) Animation, charts, and diagrams are three methods of displaying graphics. For the TWO situations below, name the most suitable method, and justify your answer. **6**

SITUATION 1. Comparing sales figures for a business over the twelve months of a financial year.

Method ……

Justification ……

……

……

SITUATION 2. Simulating the circulation of blood in a human body.

Method ……

Justification ……

……

……

(ii) Explain how *vector* graphics are stored in memory.

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(iii) Explain how *bit-mapped* graphics are stored in memory.

……

……

(iv) A photograph is *scanned* from a magazine. It is *altered* using a graphics package and included in a school newsletter. Describe TWO different ethical issues related to this activity.

1. ……

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2. ……

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QUESTION 23. (Continued) **Marks**

(c) (i) Discuss the importance of: **5**

screen resolution in relation to file size.

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colour depth in relation to file size.

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(ii) How is file compression used to reduce the size of a graphic file?

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(iii) How does *morphing* an image differ from *warping* an image?

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

(a) Explain the following terms as they relate to desktop publishing. **5**

(i) Landscape page ……

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(ii) White space ……

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(iii) Master page ……

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(iv) Typography ……

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(v) WYSIWYG ……

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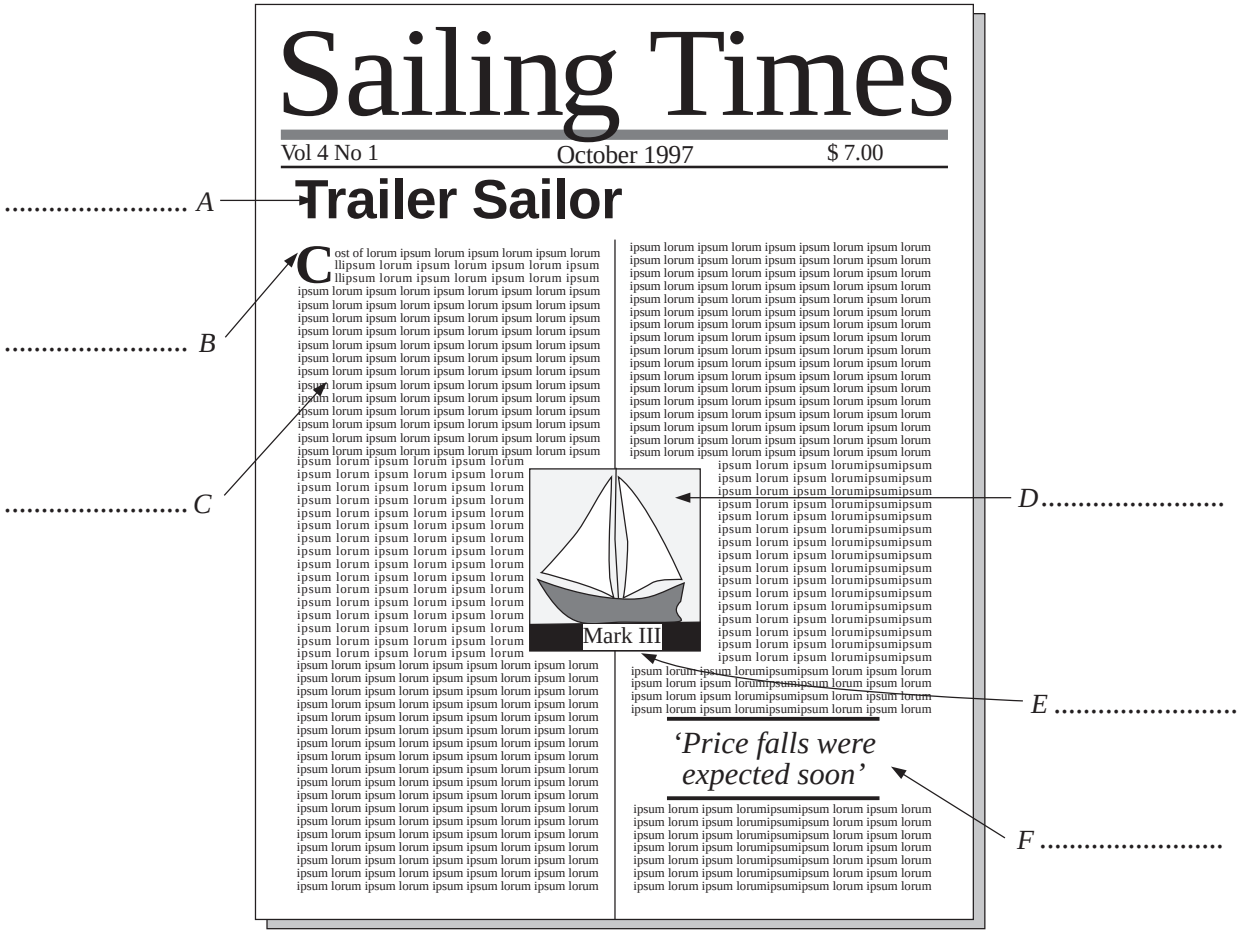
Question 24 continues on page 22

QUESTION 24. (Continued) **Marks**

(b) (i) In the spaces provided, and using ONLY terms given in the list below, name the SIX components of desktop publishing indicated on the newsletter. **6**

LIST		
• banner	• drop cap	• header
• caption	• footer	• master
• callout	• graphic	• template
• column text	• heading	• word wrap



QUESTION 24. (Continued) **Marks**

(ii) Choose any TWO of the terms given in the list in part (i) and explain how *each* enhances the effectiveness of a publication.

Name ……

Explanation ……

……

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……

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Name ……

Explanation ……

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Question 24 continues on page 24

QUESTION 24. (Continued) **Marks**

(c) (i) Describe the following TWO features of a page layout package. **5**

1. Colour capabilities ……

……

……

……

2. Ruler guides ……

……

……

……

(ii) Describe TWO ways in which a graphics package can modify a graphic used in a publication.

1. ……

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2. ……

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(iii) Explain the importance of *resolution* when selecting a printer for desktop publishing.

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

(a) (i) State ONE similarity and ONE difference between a LAN and a WAN. **6**

Similarity ……

……

Difference ……

……

(ii) State ONE similarity and ONE difference between an electronic bulletin board and a private electronic mailbox.

Similarity ……

……

Difference ……

……

(iii) Describe ONE software data-compression technique.

……

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……

(iv) Describe TWO problems of data compression.

1. ……

……

2. ……

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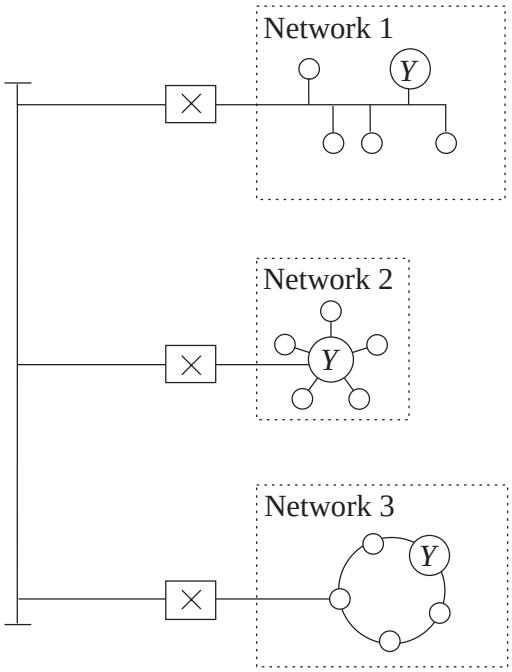
Question 25 continues on page 26

QUESTION 25. (Continued) **Marks**

(b) The following diagram shows three local networks in the same building: **6**



In the diagram, terminals (nodes) are indicated by ○.

(i) The devices marked ⊠ in the above diagram are gateways. Describe their function.

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……

(ii) Describe a method that may be used to increase security of the data messages being transmitted *between* networks.

……

……

(iii) Name the topology of each of the above networks.

Network 1 ……

Network 2 ……

Network 3 ……

QUESTION 25. (Continued) **Marks**

(iv) Terminals (nodes) marked *Y* in networks 1, 2, and 3 are file servers. Describe the function a file server performs.

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……

(v) Describe the importance of the following in network communication.

Logging off ……

……

……

Passwords ……

……

……

Question 25 continues on page 28

QUESTION 25. (Continued) **Marks**

(c) (i) Explain why most printers use *parallel* data transmission rather than *serial* transmission. **4**

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(ii) My name is Peter. My wife has just given birth to a baby girl. I want to send an electronic-mail (e-mail) message to my mother in England and to my brother, Paul, in America. I have scanned a picture of my daughter and want to send it with the following electronic-mail message:

Hi
Here is the picture of our new daughter, Anne.

Love
Peter.

The picture was scanned as a graphic file called ANNE.GIF. My e-mail address is Peter@COMPA.EDU.AU. My mother's e-mail address is Anna@COMPB.EDU.UK and my brother's is Paul@COMPC.EDU.

Fill in the appropriate areas in the following e-mail template so that the message and picture will be sent to my brother and mother.

To: ……

From: ……

CC: ……

Subject: ……

Attachments: ……

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