

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

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General Certificate of Education
 June 2002
 Advanced Level Examination



COMPUTING
Unit 5 Advanced Systems Development

CPT5

Monday 17 June 2002 Morning Session

<p>In addition to this paper you will require: a calculator.</p>
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Time allowed: 1 hour 30 minutes

Instructions

- Use blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided. All working must be shown.
- Do all rough work in this book. Cross through any work you do not want marked.

Information

- The maximum mark for this paper is 65.
- Mark allocations are shown in brackets.
- You are expected to use a calculator where appropriate.
- You will be assessed on your ability to use an appropriate form and style of writing, to organise relevant information clearly and coherently, and to use specialist vocabulary, where appropriate.
- The degree of legibility of your handwriting and the level of accuracy of your spelling, punctuation and grammar will also be taken into account.

For Examiner's Use			
Number	Mark	Number	Mark
1			
2			
3			
4			
5			
6			
7			
8			
Total (Column 1)	→		
Total (Column 2)	→		
TOTAL			
Examiner's Initials			

Answer **all** questions in the spaces provided.

1 Several testing strategies are used during the software development stages of a new system. Unit/Module testing is one example. Name **one** other that can be used.

.....
.....

(1 mark)

1

2 Name **two** manuals supplied with a major software system.

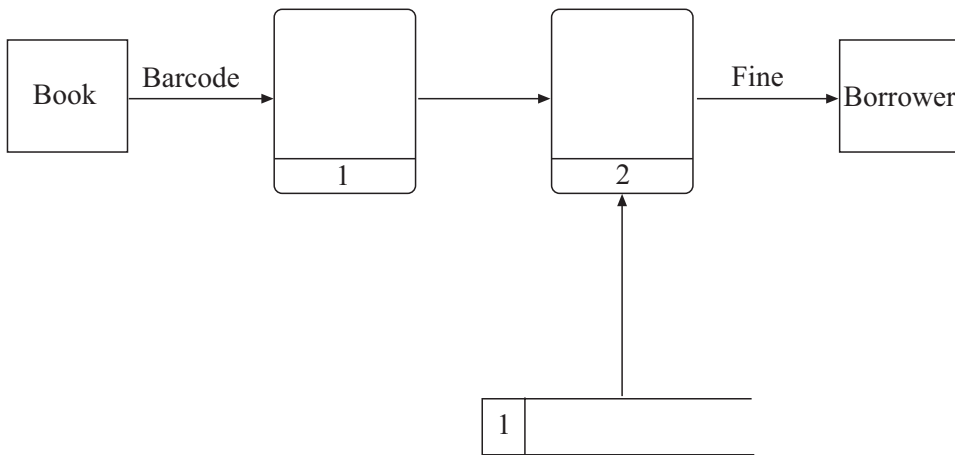
1.....

2.....

(2 marks)

2

3 A library loans system identifies each book in its stock by a unique BookID. The BookID is encoded in a barcode attached to the book. When a borrower returns a book it is scanned and any fine that is due is calculated by extracting from the library database the date that the book was due back. Complete the given data flow diagram that describes this part of the library system.



(5 marks)

5

4 (a) Explain the modes of network operation:

(i) Baseband.....

.....
.....
.....

(2 marks)

(ii) Broadband.....
.....
.....
.....
(2 marks)

(b) Bus local area networks such as Ethernet operate in baseband mode. Wide area networks operate in broadband mode.

(i) Give **two** reasons why wide area networks are operated in broadband mode.

1
.....
2
.....
(2 marks)

(ii) Explain why the performance of a bus local area network such as Ethernet degrades with increase in network traffic.

.....
.....
.....
.....
(2 marks)

(iii) Explain how switched Ethernet overcomes this problem.

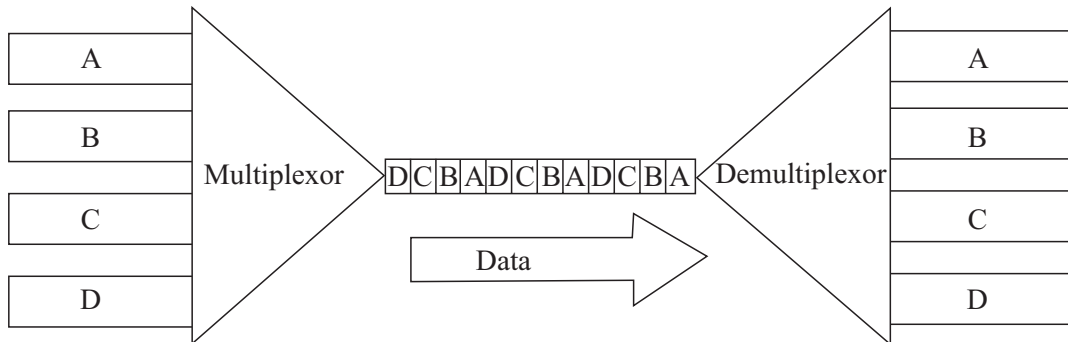
.....
.....
.....
(2 marks)

QUESTION 4 CONTINUES ON THE NEXT PAGE

Turn over ►

- (c) Figure 1 below shows an arrangement for a time-division multiplexing system. Input and output channels A, B, C, D each operate at 10 Megabit per second.

Figure 1



At what bit rate must the cable operate between the multiplexor and the demultiplexor for successful transmission?

.....
(2 marks)

12

- 5 Some countries have introduced machine-readable passports, others are currently investigating passport-free ways of identifying an individual which rely on biometric data (any specific and uniquely identifiable human characteristic) methods.

(a) Briefly explain the operation of:

- (i) **one** technique for machine-readable passports;

.....
.....
.....
.....

(2 marks)

- (ii) **one** technique that does **not** rely upon a passport.

.....
.....
.....
.....

(2 marks)

(b) Give **two** advantages of a passport-free method over a machine-readable one.

1

.....

2

.....

(2 marks)

(c) In addition to monitoring the flow of people into and out of a country, similar technology may be used within a country for identification purposes. One government has proposed a central database of biometric data (any specific and uniquely identifiable human characteristic) on its citizens which any legal organisation in the country can access to check the identity of a person.

(i) Give **two** benefits to organisations and/or government of such access.

1

.....

2

.....

(2 marks)

(ii) Give **one** reason why an ordinary law-abiding citizen might not want their biometric data made widely available in this way.

.....

.....

(1 mark)

9

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

6 Names and addresses held in a database are used with a word processor to send an individually addressed standard letter to three hundred people.

(a) What is the term used for this process?

.....
(1 mark)

(b) State **three** standard formatting features of a word processor that could have been used.

.....
.....
.....
(3 marks)

(c) The same process is used to print names and addresses for the envelopes. What other feature of a word processor could be used to aid the process?

.....
(1 mark)

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

- 7 A company advertises its HTML courses on the Internet. **Table 1** below shows the HTML form of a web page advertising HTML courses.

```
<HTML>
  <HEAD>
    <TITLE>
      ECS Ltd
    </TITLE>
  </HEAD>

  <BODY>

    <H1>HTML Courses</H1>
    <P> 1. Introduction to HTML
    <P> 2. Basic HTML
    <P> 3. Advanced HTML

    <A HREF=http://www.ecs.co.uk/main/page.html>more info</A>

  </BODY>
</HTML>
```

Table 1

- (a) What is the Internet?

.....

.....

.....

(2 marks)

- (b) With reference to the contents of **Table 1**, draw a labelled diagram to show the appearance of the web page when viewed through a web browser.

(5 marks)

- (c) The link in **Table 1** contains the uniform resource locator (URL) of another web page. Explain the four parts of this URL.

1

.....

2

.....

3

.....

4

.....

(4 marks)

- 8 Customers placing orders with ABC Ltd for ABC's products have their orders recorded by ABC in a database.

The data requirements for the database system are defined as follows:

- Each product is assigned a unique product code, ProductId and has a product description.
- The quantity in stock of a particular product is recorded.
- Each customer is assigned a unique customer code, CustomerId and has their name, address and telephone number recorded.
- An order placed by a customer will be for one or more products.
- ABC Ltd assigns a unique code to each customer order, ABCOrderNo.
- A customer placing an order must supply a code, CustomerOrderNo, which the customer uses to identify the particular order.
- A customer may place one or more orders.
- Each new order from a particular customer will have a different customer order code but two different customers may use, independently, the same values of customer order code.
- Whether an order has been despatched or not will be recorded.
- A particular order will contain one or more lines.
- Each line is numbered, the first is one, the second is two, and so on.
- Each line will reference a specific product and specify the quantity ordered.
- A specific product reference will appear only once in any particular order placed with ABC Ltd.

After normalisation the database contains four tables based on the entities:

Customer, Product, Order, OrderLine

- (a) **Figure 2** below is a partially complete entity-relationship diagram. Show the degree of **three** more relationships which exist between the given entities.

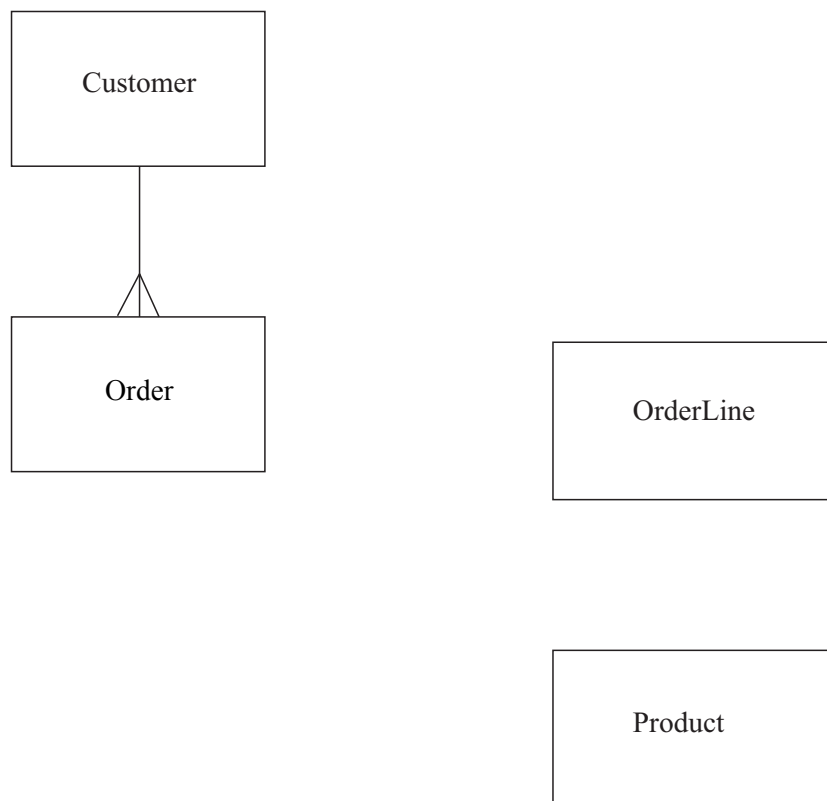


Figure 2

(3 marks)

(b) Using the following format:

TableName(Primary Key, Non-key Attribute1, Non-key Attribute2, etc)

describe tables, stating all attributes, for the following entities underlining the primary key in each case.

(i) Product.....
.....
(2 marks)

(ii) Customer.....
.....
(2 marks)

(iii) Order.....
.....
(3 marks)

(iv) OrderLine
.....
(4 marks)

(c) Using the SQL commands SELECT, FROM, WHERE, ORDER BY, write an SQL statement to query the database tables for all customer names where the orders have been despatched. The result of the query is to be ordered in ascending order of ABCOrderNo.

.....
.....
.....
.....
.....
.....
.....
(6 marks)

END OF QUESTIONS

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE