

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced GCE

COMPUTING

Integrated Information Systems

2511

Tuesday

24 JANUARY 2006

Morning

1 hour 30 minutes

| | | | | | | | | | | | | | | |
|----------------|---|------------------|--|--|--|--|--|---|--|--|--|--|--|--|
| Candidate Name | Centre Number | Candidate Number | | | | | | | | | | | | |
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TIME 1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

- Write your name in the space above.
- Write your Centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- If you run out of space for an answer, continue on the spare pages at the back of the booklet.
- If you use these spare pages, you must write the question number next to your answer. You can also use the spare pages for rough work.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is 90 (86 + 4 written communication).
- You will be awarded marks for the quality of written communication where an answer requires a piece of extended writing.
- No marks will be awarded for using brand names of software packages or hardware.

| FOR EXAMINER'S USE | | |
|--------------------|-----------|------|
| Question no. | Max. Mark | Mark |
| 1 | 11 | |
| 2 | 20 | |
| 3 | 17 | |
| 4 | 16 | |
| 5 | 22 | |
| WC | 4 | |
| TOTAL | 90 | |

This question paper consists of 12 printed pages, 3 lined pages and 1 blank page.

Ava and Bill rent a unit on a business park for small businesses. Ava makes pottery for sale to gift shops in tourist areas. Bill looks after administration and sales using a PC with a modem and colour printer. Neither Ava nor Bill are very computer literate.

1 Bill has been advised to purchase an off-the-shelf integrated package rather than custom-written software.

(a) Explain the meaning of the terms *integrated package* and *custom-written software*.

Integrated package
.....
.....
.....[2]

Custom-written software
.....
.....
.....[2]

(b) Give **two** advantages and **one** disadvantage of purchasing an off-the-shelf integrated package rather than a custom-written package.

Advantage 1
.....

Advantage 2
.....[2]

Disadvantage
.....[1]

2 Bill wants to keep details of his customers and the products they purchase. He has been advised to use a relational database.

(a) Describe the meaning of the term *relational database*.

.....
.....
.....[2]

(b) Bill has drawn the entity-relationship (E-R) diagram shown in Fig. 1.



Fig. 1

(i) Describe the relationships shown in Fig. 1.

.....
.....
.....
.....
.....
.....
.....
.....
.....[4]

(ii) State why this E-R diagram is **not** in third normal form.

.....
.....[1]

(iii) Draw the E-R diagram in third normal form.

[2]

(iv) Explain why the database should be in third normal form.

.....

.....

.....

.....[2]

(c) One of the tables (relations) is

CUSTOMER(CustID, CName, Street, Town, County, PostCode, Contact, Phone)

This shows that CustID is the key attribute and that CName, Street, Town, County, PostCode, Contact and Phone are the other attributes of the table CUSTOMER.

Using the same notation, define the other **three** tables (relations). Indicate the key by underlining the attribute(s) that make up the key. Place asterisks (*) by the foreign keys.

.....

.....

.....

.....

.....

.....

.....[9]

- 3 Ava and Bill wish to advertise their products by using the World Wide Web (WWW) and the Internet.

(a) Explain the terms *World Wide Web* and *Internet*.

World Wide Web

 [2]

Internet.....

 [2]

Carol has been employed to design and create a web site for Ava and Bill. Carol uses the hypertext mark up language (HTML) to create some parts of the site. Some of this text is shown in Fig. 2.

```
<HTML>
<HEAD>
<TITLE> AB Pottery </TITLE>
</HEAD>

<BODY>
<HR>
<H1> Hand-made individual pottery </H1>
</HR>
You can see Ava making pottery at
<A HREF =
http://www.abpottery.co.uk:potter.html>
her wheel </A> if you are interested.
</BODY>
</HTML>
```

Fig. 2

(b) Using **three** examples from Fig. 2, explain the term *mark up tags*.

.....
.....
.....
.....
.....
.....
.....
.....
.....[6]

(c) (i) Explain what is meant by hypertext linking.

.....
.....
.....
.....
.....
.....[3]

(ii) Identify a hypertext link in Fig. 2.

.....
.....[1]

(iii) Show how this link is depicted on the screen.

.....
.....[2]

(iv) State what is loaded when the link is activated.

.....[1]

4 Bill has been talking to his neighbours in the business park, each of whom has a small local area network (LAN). Bill currently has three stand-alone PCs and each is used for a different purpose. Due to expansion, Bill employs two clerical staff who also need access to the computers.

(a) Explain the meaning of the term *LAN*.

.....
.....
.....
.....[2]

(b) Explain the advantage to Bill of having a LAN.

.....
.....
.....
.....[2]

(c) With the aid of a diagram, explain how a hub can be used to network Bill's computers.

.....
.....
.....
.....[3]

Bill and his neighbours occupy units that are next to one another.

(d) With the aid of a diagram, explain how a bridge can be used to connect two LANs.

.....
.....
.....
.....
.....[3]

(e) Explain how emails are sent between machines that are on the two LANs. You should clearly explain the role of the bridge in this procedure.

.....
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.....
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.....
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.....
.....
.....[4]

(f) A bridge works at the ISO/OSI data-link layer.

State **two** functions of the data-link layer.

Function 1
.....
Function 2
.....[2]

(b) An alternative solution for predicting delivery dates is to use critical path analysis (CPA) and resource allocation.

(i) State **four** components of a CPA diagram.

Component 1

Component 2

Component 3

Component 4[4]

(ii) Explain how a CPA diagram may be affected when resources are allocated.

.....
.....
.....
.....
.....
.....
.....[3]

(c) The manufacturer of the candles is considering automating the warehouse. This is to be done by using robots to collect boxes of candles from the packaging machines, identifying the contents of the boxes and, under computer control, delivering them to a suitable part of the warehouse.

When orders are received in the warehouse, robots have to be instructed to collect the boxes that make up the orders and deliver them to the output bay.

(i) Describe a method that the robot can use to identify what is in a box when the robot collects it from the packaging machine.

.....
.....
.....
.....[2]

(ii) Explain how the robots and the controlling computer can communicate.

.....
.....
.....
.....[2]

(iii) Explain what processing has to be done so that the robot can be directed to the correct place in the warehouse to deposit a box of candles.

.....
.....
.....
.....
.....
.....
.....[3]

(iv) Explain how the computer can navigate the robot around the warehouse.

.....
.....
.....
.....[2]

A series of horizontal dotted lines for writing.

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