INFORMATION TECHNOLOGY:
SOFTWARE DEVELOPMENT

Written examination

Thursday 15 November 2007
Reading time: 11.45 am to 12.00 noon (15 minutes)
Writing time: 12.00 noon to 2.00 pm (2 hours)

QUESTION AND ANSWER BOOK

Structure of book

<table>
<thead>
<tr>
<th>Section</th>
<th>Number of questions</th>
<th>Number of questions to be answered</th>
<th>Number of marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>B</td>
<td>5</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>C</td>
<td>15</td>
<td>15</td>
<td>53</td>
</tr>
<tr>
<td>Total</td>
<td>93</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners, rulers and one scientific calculator.
• Students are NOT permitted to bring into the examination room: blank sheets of paper and/or white out liquid/tape.

Materials supplied
• Question and answer book of 25 pages with a detachable insert containing a case study for Section C in the centrefold.
• Answer sheet for multiple-choice questions.

Instructions
• Remove the insert containing the case study during reading time.
• Write your student number in the space provided above on this page.
• Check that your name and student number as printed on your answer sheet for multiple-choice questions are correct, and sign your name in the space provided to verify this.
• All written responses must be in English.

At the end of the examination
• Place the answer sheet for multiple-choice questions inside the front cover of this book.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

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SECTION A – Multiple-choice questions

Instructions for Section A
Answer all questions in pencil on the answer sheet provided for multiple-choice questions. Choose the response that is correct for the question. A correct answer scores 1, an incorrect answer scores 0. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

Question 1
A recently developed piece of software requires 512 MB of RAM to run effectively. Based on the information provided below, which laptop is definitely able to run this software?

A. GSX Super Notebook
   Features include:
   - Celeron 1.8 GHz, 15” XGA
   - 60 GB HDD, DVDRW
   - LAN, WIFI

B. HSV Games Notebook
   Features include:
   - Core Duo 2.0 GHz
   - 256 MB RAM
   - 100 MB HDD, Bluetooth, DVDRW

C. SP Business Notebook
   Features include:
   - Core Duo 1.66 GHz
   - 120 GB HDD, wireless LAN
   - 256 MB RAM upgradable

D. GTX Student Notebook
   Features include:
   - Celeron 1.66 GHz
   - 17” WXGA, 1 GB RAM
   - 80 GB HDD, LAN, Bluetooth

Question 2
Stages of software development include
A. designing, testing, operating.
B. analysing, testing, documenting.
C. analysing, coding, documenting.
D. solving, implementing, evaluating.

Question 3
An ‘array’ and a ‘record’ are two types of data structure. The main difference between the two is that
A. arrays can only store the same type of data in each element.
B. records can only store the same type of data in each field.
C. arrays can only store numeric data.
D. records can only store textual data.
Question 4
A text editor can be used to
A. view and edit program icons.
B. write and test programs without the need for other software.
C. test programs and make any necessary corrections.
D. write programs which can then be tested using another program.

Question 5
When evaluating a piece of software for the role required, the best criteria to use would be
A. stability, reliability and usability.
B. stability, reliability and popularity.
C. reliability, sustainability and usability.
D. usability, popularity and flexibility.

The following diagram shows the folder structure for a file server.
Use this diagram to answer Questions 6 and 7.

Question 6
The box labelled ‘accounts’ in the diagram is best described as
A. a file.
B. a folder.
C. a hard disk.
D. a field.

Question 7
The full path to invoice b4532 is
A. invoices\b4532
B. accounts\invoices\b4532
C. root\accounts\invoices\b4532
D. root\accounts\invoices\b1245\
**Question 8**
The product code **T39.04** is best stored as the data type
A. floating point.
B. integer.
C. text (string).
D. Boolean.

*The following information is to be used to answer Questions 9, 10 and 11.*

Programs A, B and C were run 1000 times each on the same computer. The following statistics were obtained.

<table>
<thead>
<tr>
<th></th>
<th>Program A</th>
<th>Program B</th>
<th>Program C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of errors in output</td>
<td>4</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Average running time</td>
<td>3.2 s</td>
<td>2.9 s</td>
<td>3.5 s</td>
</tr>
<tr>
<td>Total number of fatal errors (program ‘crash’)</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Question 9**
Which statement about efficiency is supported by the evidence in the table?
A. Program A is more efficient than Program C.
B. Program B is not as efficient as Program A.
C. Program C is the most efficient program.
D. Program A and Program C are both more efficient than Program B.

**Question 10**
Which statement about reliability is supported by the evidence in the table?
A. Program A is more reliable than Program C.
B. Program C is as reliable as Program A.
C. Program A is not as reliable as Program B.
D. Program C is the most reliable program.

**Question 11**
Which statement about stability is supported by the evidence in the table?
A. Program B is an unstable program.
B. Program A is as stable as Program C.
C. Program B is the least stable program.
D. Program C is more stable than Program B.
Question 12
The following IF statement needs to be tested.

IF b > 10 AND b < 20 THEN
    PRINT b
ENDIF

The best set of test data for \( b \) to test this algorithm is
A. 10, 11, 15, 19, 20
B. 8, 9, 10, 11, 20
C. 9, 10, 12, 20, 21
D. 8, 9, 10, 20, 21

Question 13
After making substantial changes to its information system, BTQ Pty Ltd kept a logbook of all errors encountered when running the new software. System users were also monitored to see how quickly they completed certain tasks when using the new system. After six months the system performance data was analysed and a report was written for BTQ’s management.
Which aspect of the System Development Life Cycle is described above?
A. the analysis phase
B. the evaluation phase
C. the testing phase
D. the operational phase

Question 14
Here is a summary of an error log for one of the objectives of a transaction processing system.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1378467</td>
</tr>
<tr>
<td>Successful scans</td>
<td>1325411</td>
</tr>
<tr>
<td>Unsuccessful scans</td>
<td>53056</td>
</tr>
<tr>
<td>%</td>
<td>3.85%</td>
</tr>
</tbody>
</table>

This data would show that the objective has been met if the objective was
A. a success rate of less than 4%
B. a response rate of less than 4%
C. an accuracy rate of less than 4%
D. a failure rate of less than 4%

Question 15
What is Spyware?
A. any program that runs on your computer to detect spies
B. any program that is triggered by a specific date
C. any program that replicates itself on your computer
D. any program that monitors what you do on your computer in order to use this information without you knowing
Question 16
The clock speed of a CPU is measured in
A. bits per second.
B. bytes per second.
C. hertz.
D. gigs.

Question 17

1
\[
\begin{align*}
\text{begin} \\
\quad \text{while not EOF do} \\
\qquad \text{write count} \\
\qquad \text{read weight} \\
\qquad \text{count }\leftarrow \text{count }+1 \\
\text{end}
\end{align*}
\]

2
\[
\begin{align*}
\text{not EOF} \\
Y \quad \text{write count} \\
\text{read weight} \\
\quad \text{Y} \\
\quad \text{count }\leftarrow \text{count }+1 \\
\quad \text{write count}
\end{align*}
\]

Which statement about diagrams 1, 2 and 3 is true?
A. The algorithm represented by diagram 1 is the same as that represented by diagram 2.
B. The algorithm represented by diagram 2 is the same as that represented by diagram 3.
C. The algorithm represented by diagram 3 is the same as that represented by diagram 1.
D. All three diagrams represent the same algorithm.

Question 18
A program is being designed for a networked desktop computer that has 120 GB available on its hard disk drive. It will have to read data from a 500 MB file on a CD-ROM. The CD-ROM drive is on the computer that will run the program. The programmer would like the program to run in the shortest time possible.

The main factor that the programmer will have to consider when designing the program is
A. data transfer rate over the network.
B. the size of the computer’s hard disk drive.
C. the time taken to retrieve data from the CD-ROM.
D. the time taken to write data to the CD-ROM.
**Question 19**
When implementing a new system, a large chain of supermarkets decides to install the system in one supermarket while the others continue to use the existing system. When all bugs are fixed the system will be installed at the other supermarkets.

This is an example of
A. pilot conversion.
B. direct conversion.
C. phased conversion.
D. parallel conversion.

**Question 20**
To assist a technician to install a new server on an existing system, which of the following documents would be useful?
A. server technical manual, operating system manual, applications manual
B. server technical manual, system recovery manual, networking manual
C. server technical manual, networking manual, operating system manual
D. server technical manual, backup manual, system recovery manual
SECTION B – Short answer questions

Instructions for Section B
Answer all questions in the spaces provided.

Question 1
Describe the differences between a bus, a star and a hybrid network topology.

Question 2
Robert is a professional photographer who saves an average of 100 pictures (each approximately 2 MB) per day. The hard disk on his computer is rapidly filling up.

a. If he saves pictures on 300 days a year, how much storage space (in Gigabytes) will one year’s images take?

b. Judy suggests that he burns the images onto CDs and then removes these images from his hard disk.

b. Describe one problem that Robert may have using CDs as his only photo storage solution.
Describe and justify a better solution for Robert to use to store his pictures and keep them safe.
**Question 3**
For each of the acceptance criteria listed below, describe a testing procedure that would show if the criterion was being met.

<table>
<thead>
<tr>
<th>Acceptance criteria</th>
<th>Testing procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>The server must have less than two failures in a month</td>
<td></td>
</tr>
<tr>
<td>The network is able to have 150 computers logged on at the same time without crashing</td>
<td></td>
</tr>
<tr>
<td>More than one user can be using the system and updating the same files at the same time</td>
<td></td>
</tr>
<tr>
<td>Records can always be retrieved in less than four seconds</td>
<td></td>
</tr>
</tbody>
</table>

4 marks
Question 4
Hungarian notation is a naming convention for program elements such as variables and objects. The convention is that the first two or three letters of the element’s name indicate the type of element. The rest of the name indicates its purpose, and starts with a capital letter; for example a text box containing a first name could be called **txtFname**. State **three** benefits of this method of naming.

---

3 marks

Question 5
Mick had been an IT teacher at BN College for 15 years. During this time, he had created and supported their administrative system. Management wanted to sell the system to other schools to earn funds for the school. Mick rejected this idea claiming it would create too much work and would interfere with his teaching. Last year Mick moved to a new school in the new suburb of Melinda. He immediately adapted and installed his administrative system in his new school to the disapproval of the management of BN College. Identify and discuss a legal or ethical issue involved in this situation.

---

4 marks

Total 20 marks
SECTIO\n
Instructions for Section C
Answer all questions in the spaces provided. Remove the case study insert and read all the information provided before you answer these questions. Answers must apply to the case study.

Kayla knows that to help Sebastian she must first fully understand the problems, and then analyse the current system.

To start her system analysis, Kayla has drawn the diagram (Figure 1) in the case study insert. It shows the movement of goods, invoices and orders associated with Flip Flop Bakery’s operation, and the role of the various people involved. She now has to create a logical design for the bakery’s information system by drawing a context diagram and data flow diagrams, as well as constructing a data dictionary.

Question 1
Kayla has started the context diagram.

a. The label for the unnamed entity should be ___________________________________________________________________________ 1 mark

b. Figure 1 in the case study insert shows three arrows going between the Cake supplier and the Bakery, but the context diagram only shows two. Explain this difference.

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

1 mark

SECTION C – Question 1 – continued
c. Kayla has based her context diagram on Figure 1. Explain why she has drawn the Bakers as a separate entity.

1 mark
Question 2
Kayla has made three attempts to draw a data flow diagram for the processing of customer orders and determining the baking requirements. Consider the accuracy of the DFDs shown below.

DFD A
Customer orders → Process orders → Calculate quantities needed → Sort into baking batches → Recipes
Customer invoices → Process orders
Customer orders → Calculate quantities needed
Ingredients getting low → Calculate quantities needed
Items to be baked → Sort into baking batches
Recipe ingredients → Sort into baking batches
Item name + ingredient quantities → Sort into baking batches
Baking requirements

DFD B
Customer orders → Process orders → Calculate quantities needed → Sort into baking batches → Recipes
Customer invoices → Process orders
Customer orders → Calculate quantities needed
Ingredients getting low → Calculate quantities needed
Items to be baked → Sort into baking batches
Recipe ingredients → Sort into baking batches
Item name + ingredient quantities → Sort into baking batches
Baking requirements

DFD C
Customer orders → Process orders → Calculate quantities needed → Sort into baking batches → Recipes
Customer invoices → Process orders
Customer orders → Calculate quantities needed
Ingredients getting low → Calculate quantities needed
Items to be baked → Sort into baking batches
Recipe ingredients → Sort into baking batches
Item name + ingredient quantities → Sort into baking batches
Baking requirements
a. Identify the most correct data flow diagram.

DFD ___

1 mark

b. Explain what the main error is in each of the other two data flow diagrams.

DFD ___ is incorrect because

________________________________________________________________________

________________________________________________________________________

DFD ___ is incorrect because

________________________________________________________________________

________________________________________________________________________

2 marks

Kayla has also created a data dictionary, part of which is shown below.

<table>
<thead>
<tr>
<th>Flip Flop data dictionary – page 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
</tr>
<tr>
<td>Items to be baked</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Recipe ingredients</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Calculate quantities needed</td>
</tr>
<tr>
<td>Item name</td>
</tr>
</tbody>
</table>

c. Identify one inappropriate entry in the data dictionary and explain why it is inappropriate.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

2 marks
Kayla has completed her analysis of the system. She has decided to start the design of the new system with the design of the software. From her analysis she knows that one thing the system has to do is to calculate the required amount of each ingredient.

She designs an algorithm that

• reads a file to get the total number of different ingredients Sebastian keeps in stock (Num_Ingredients)
• for each bread item (Product_ID) ordered, uses recipe data and the number of items ordered (Num_Ord) to calculate the amount of each ingredient required for that item (Amount_Req)
• adds the ingredient amounts required for each item to get the total quantity needed for each ingredient Qty

The procedure will have passed to it data that lists the amount of each ingredient required for every bread item made by the bakery (Product_Recipes)

Here is Kayla’s algorithm.

PROCEDURE Calc_Qty(Product_Recipes)
BEGIN
  Open File
  Ingredient_ID ← 1
  READ Num_Ingredients
  REPEAT
    Qty(Ingredient_ID) ← 0
    Ingredient_ID ← Ingredient_ID + 1
  UNTIL Ingredient_ID > Num_Ingredients
  REPEAT
    READ Product_ID, Num_Ord
    Ingredient_ID ← 1
    REPEAT
      Ingredient_ID ← Ingredient_ID + 1
      Amount_Req ← Num_Ord * Product_Recipes(Product_ID, Ingredient_ID)
      Qty(Ingredient_ID) ← Qty(Ingredient_ID) + Amount_Req
    UNTIL Ingredient_ID = Num_Ingredients
    UNTIL End Of File
  Close File
END

Question 3
a. What is the purpose of the first REPEAT – UNTIL loop?
To test the algorithm Kayla decides to use some simplified test data with only 1 bread product and only 3 ingredients.

b. Using the data below complete the test table.

<table>
<thead>
<tr>
<th>Test data</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Num_Ingredients</td>
<td>3</td>
</tr>
<tr>
<td>Product_ID</td>
<td>1</td>
</tr>
<tr>
<td>Num_Ordered</td>
<td>10</td>
</tr>
<tr>
<td>Product_Recipes(1,1)</td>
<td>0.15</td>
</tr>
<tr>
<td>Product_Recipes(1,2)</td>
<td>0</td>
</tr>
<tr>
<td>Product_Recipes(1,3)</td>
<td>0.20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test table</th>
<th>Expected value</th>
<th>Actual value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty(1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qty(2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qty(3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3 marks

c. Describe the error in the algorithm.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

1 mark

d. Suggest one way the algorithm could be altered to fix this error.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

2 marks
Question 4
Complete the following data table by inserting the correct data type from the options integer, floating point, string, boolean, one dimensional array and two dimensional array.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Use</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredient_ID</td>
<td>Loop Control on Ingredient ID</td>
<td>integer</td>
</tr>
<tr>
<td>Num_Ingredients</td>
<td>Total Number of Ingredients</td>
<td></td>
</tr>
<tr>
<td>Qty()</td>
<td>Quantity in kilos of an Ingredient</td>
<td></td>
</tr>
<tr>
<td>Product_Recipes()</td>
<td>Quantity of a particular item required</td>
<td></td>
</tr>
<tr>
<td></td>
<td>for a single product</td>
<td></td>
</tr>
</tbody>
</table>

3 marks

Question 5
Kayla and her uncle Michael, an experienced programmer, were discussing the best file structure to use to store the orders for each day. Sebastian has 300 regular customers who have different orders for each day of the week. As well he can have 50 casual orders on any day. Twenty-five per cent of his regular customers alter their daily order from week to week. Kayla suggests using a simple Serial Access file while Michael argues that due to the number of changes each day, a Random Access file would be best.

For the bakery’s application, explain the advantage of the Random file structure for the organisation of this data.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

2 marks
Question 6
As part of the design of the new system, Kayla must decide what kind of mobile device the drivers should use. She has a choice of the following.

- A laptop – this will be used to enter and store orders which will then be uploaded to the bakery’s computer on return.
- A Personal Digital Assistant (PDA) – this will be used to enter and immediately transmit orders from the van to the bakery’s computer.
- A mobile phone – this will be used to text or phone the orders from the van to Sebastian at the bakery.

State two advantages of each device for the given use.

Laptop

Advantage 1

_________________________

Advantage 2

_________________________

PDA

Advantage 1

_________________________

Advantage 2

_________________________

Mobile phone

Advantage 1

_________________________

Advantage 2

_________________________

6 marks
### Question 7

Kayla has decided that the best device for the delivery drivers to take orders would be a Digital PDA. These will be used to transmit orders from the van to the Bakery’s computer. Sebastian agrees with this choice. Kayla has three PDA models to choose from. The specifications are given below.

<table>
<thead>
<tr>
<th>Key features</th>
<th>Peach</th>
<th>Watermelon</th>
<th>Strawberry</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAM</td>
<td>8 MB</td>
<td>32 MB/expansion slot</td>
<td>16 MB</td>
</tr>
<tr>
<td>Display</td>
<td>65 000 colours</td>
<td>65 536 colours</td>
<td>65 536 colours</td>
</tr>
<tr>
<td>Input</td>
<td>touch screen</td>
<td>QWERTY keyboard; touch screen</td>
<td>QWERTY keyboard</td>
</tr>
<tr>
<td>Connectivity</td>
<td>Internet enabled mobile phone</td>
<td>Bluetooth</td>
<td>Internet enabled mobile phone</td>
</tr>
<tr>
<td>Battery</td>
<td>Rechargeable/replaceable</td>
<td>Rechargeable/replaceable; extra cell</td>
<td>Rechargeable/replaceable; extra cell</td>
</tr>
<tr>
<td>Processor</td>
<td>200 MHz</td>
<td>400 MHz</td>
<td>300 MHz</td>
</tr>
<tr>
<td>Resolution</td>
<td>320 × 320</td>
<td>480 × 640</td>
<td>480 × 640</td>
</tr>
<tr>
<td>Camera</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>

Considering the role that the PDAs will have, recommend the most suitable model. Give **two** reasons to justify your answer.

**Recommended PDA**

**Reason 1**

**Reason 2**

**4 marks**
**Question 8**
Kayla now plans to set up the new system.
She explains that buying the bakery computer and PDAs and setting them up will take about 3 days; writing, testing and debugging the programs for the bakery computer will take 20 days; writing, testing and debugging the programs for the PDAs will take 15 days; and testing the whole system and making sure it works could take 5 days.

a. Complete the Gantt chart below to show how the four tasks could be completed inside **30 days**.

<table>
<thead>
<tr>
<th>Task</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
<th>45</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy and set up equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program PDAs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 marks

b. The task ‘test system’ is dependent on both programming tasks being completed first. Show this on your Gantt chart above.

1 mark

**Question 9**
Michael has agreed to help write the programs for the new system. He has advised Kayla that he wants the programs to have good internal documentation: they should contain comment lines and all variables and procedures should have meaningful names. Kayla feels this is a waste of time as she can program much faster with short variable names and no comments.

Explain why Kayla should follow Michael’s advice.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

2 marks
Question 10
Kayla is writing the program for the PDAs. She is concerned that the drivers may accidentally enter the wrong information into the PDA.
Describe what type of data validation Kayla needs to code into her program to limit the following possible errors.

a. A driver enters 100 dozen loaves instead of 1 dozen loaves

b. A driver tries to enter an order for a bread product that Flip Flop Bakery does not make

Question 11

The diagram above shows Kayla’s first attempt at an interface for the PDAs.

a. What design error has she made?

b. How can it be improved?
Question 12
The diagram below shows a screen for the bakery computer that will alert Sebastian that there is an incoming message.

![Incoming Message Screen]

**a.** What is the logical error with this screen?

__________________________________________________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________________________________________________

1 mark

**b.** Describe how to change this screen to correct this error.

__________________________________________________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________________________________________________

1 mark
**Question 13**
In their many discussions, Michael has reminded Kayla that staff need training. She tells Sebastian that he has to close the bakery for a day so that she can train everyone including the bakers, drivers and sales staff. She will train them in all aspects of the system. Sebastian is concerned about the cost of shutting the bakery but Michael has other concerns.

a. State a concern with this training strategy other than the cost of shutting the bakery.

b. Briefly describe a better approach to make certain that staff can operate the new system.

**Question 14**
As well as training, Michael suggests to Kayla that she should produce user documentation for the drivers to use while making deliveries.

Kayla has several ideas.

Option 1 – Burn a video onto DVD so they can see what to do
Option 2 – Put help onto Flip Flop’s new website
Option 3 – Print a quick guide that covers basic use of the software onto a card that can be put into their pocket
Option 4 – Electronic help manual with a search facility stored on the PDA

State which option is the best in this case and justify your answer.
Question 15
The system is in its first week of operation: all the drivers have a PDA and the bakery computer is also operating as a web server. The PDAs are successfully accessing the bakery’s website through the Internet and transmitting orders. Sebastian, however, has read an article about conducting business on the Internet. He has discovered that
• his website could be accessed by unauthorised people
• there might be times when the PDAs are not able to connect to the web server.
For each of these situations, explain a strategy that the bakery could use to limit or eliminate the concern.

a. The website can be accessed by unauthorised people

b. There might be times when the PDAs are not able to connect to the web server

Total 53 marks
CASE STUDY INSERT FOR SECTION C
Please remove from the centre of this book during reading time.
Flip Flop Bakery

Flip Flop Bakery is owned by Sebastian, who is a baker. He employs two assistant bakers, three delivery drivers and four part-time sales assistants.

Flip Flop Bakery makes bread and bread rolls that it sells to the public through a shop. It also sells its bread, and a range of cakes and pastries that are bought from a wholesale cake supplier, to local restaurants, coffee lounges and clubs.

A typical working day follows this sequence.

• Sebastian and the assistant bakers arrive at the bakery and start baking at 4.00 am.
• All breads and other bread products (bread rolls and so on) are baked by 7.00 am.
• The bakers identify any ingredients that are in low supply and inform Sebastian.
• The drivers arrive at the bakery and start loading their trucks at 8.00 am.
• Cake deliveries arrive at the bakery around 8.00 am.
• The bakery drivers deliver their goods and invoices to the customers from 9.00 am.
• Drivers handwrite orders from the regular customers and return these to the bakery by 1.00 pm.
• Sebastian manually combines the orders and writes a list of the next day’s baking requirements.
• Sebastian telephones his orders for the necessary ingredients and cakes from his suppliers. Orders must be placed by 3.00 pm to ensure delivery for the next day’s baking.
• The bakery closes at 5.00 pm.

The problems

Sebastian has identified a number of problems that, because of the growth of his business, have now become critical.

1. When drivers return to the bakery later than 1.00 pm, Sebastian cannot complete the next day’s list of baking requirements.
2. Some drivers have such bad handwriting that Sebastian has trouble reading the orders.
3. Sebastian now spends too much time combining the orders and completing the next day’s baking requirements list.
4. Sometimes Sebastian cannot order extra ingredients on time therefore he cannot bake all of the next day’s bread and so loses orders.

Proposed system

To ensure the continued success of his business, Sebastian realises that he must make some changes to his ordering processes. Sebastian’s daughter, Kayla, has just completed the first year of a university course in software engineering. She offers to look at how the problems might be solved.

Kayla believes that the only way to improve efficiency is to have a computerised ordering system. There would be a computer at the bakery and the delivery truck drivers would have some kind of mobile device. They would use this to collect and transfer data to the new computer.
Figure 1

END OF CASE STUDY INSERT FOR SECTION C