QATs
Quality Assessment Tasks

NAME: _____

VCE® Computing: Software Development

Unit 3 & 4 Practice written examination

Reading time: 15 minutes
Writing time: 2 hours

QUESTION AND ANSWER BOOK

Structure of book

Section	*Number of questions*	*Number of questions to be answered*	*Number of marks*
A	20	20	20
B	5	5	20
C	12	12	60
			TOTAL 100

- 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 24 pages
- Detachable insert at end of booklet.
- Answer sheet for multiple choice questions.

Instructions

- Remove the insert containing the case study during reading time.
- Write your **name** in the space provided above on this page **and** on the answer sheet for multiple-choice questions.
- 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.

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 or that **best answers** 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

My local medical practice wants to provide WiFi for patients while they wait. Which of the following would be a functional requirement for the system?

A. The system must be easy to use.

B. Downloads should be limited.

C. The WiFi should be secured with a password.

D. The WiFi must be able to support 50 patients at the same time.

Question 2

In a Gantt chart, a milestone is used to indicate

A. the end of the project.

B. the midpoint of the project.

C. a significant part has just finished.

D. a significant part is about to begin.

Question 3

A company has a twice daily backup routine which is checked every month. Customers who do not contact the company for 6 months are removed from the main database but can still be found in the complete company records database. This is an example of

A. archiving.

B. efficiency.

C. file disposal.

D. data security.

Question 7

Which of the following is definitely **NOT** a non-functional requirement for an app?

A. The app should work quickly.

B. The app should keep a copy of all user input for a month.

C. Colours should not include Red and Green next to each other.

D. Colours used should mainly be from the colours on the company's letterhead.

Use the following information to answer Questions 8 and 9

A simple array (named `TrickyArray`) is used in the following pseudo code.
`TrickyArray` is a zero based array.

```
Begin
    TrickyArray[] ← [7, 2, 0, 1] //initialise the array
    Number1 ← TrickyArray[1]
    Number2 ← TrickyArray[2]
    Repeat
        Number3 ← 2* Number2
        Number1 ← Number1 + 1
        Number2 ← Number2 + 1
    Until Number3 > Number1
    Display Number1, Number2, Number3
End
```

Question 8

At the end of the procedure the display will show

A. 6, 6, 4

B. 7, 5, 8

C. 12, 12, 7

D. 14, 13, 8

Question 9

The algorithm contains examples of which programming structures?

A. Iteration and sequence

B. Selection and iteration

C. Iteration and assignment

D. Selection and assignment

Question 10

A video streaming service uses 0.7MB per second (0.7MBps) to show a medium quality film. The service will not start showing the film until at least 15 seconds of video is downloaded (as a buffer). Peter has a low-quality Internet connection. On a wet Saturday his connection is only running at 9 megabits per second (9Mbps). How long must he wait until the film starts showing?

A. 0.7 seconds

B. 1.2 seconds

C. 9.4 seconds

D. 12.9 seconds

Question 11

After the first pass of a quick sort on an array, the array looks like this:

10	20	11	15	8	21	25	25	24	22	22

The pivot point on the first pass must have been 21 because

A. all of the numbers to the right of 21 are larger than 21.

B. all of the numbers to the left of 21 are smaller than 21.

C. the sixth number is 21, which is half of 11 rounded up.

D. both **A and B.**

Question 12

An object is created with this structure

```
Person_doing_this

     Name

     Gender

     VCAA_Number

     Excitement_Level
```

This object is best described technically as a

A. file.

B. record.

C. collection of strings.

D. collection of records.

Question 13

Just prior to implementing a new software solution into a client's network, Peta wants to perform User Acceptance Testing. This means that she will

A. log on as a user and check for bugs and problems.

B. install it on the network and remotely monitor as users begin to work with it.

C. take it to the client and have the client log on and check that it does what was requested.

D. take it to the client's offices and install it on a computer and have all of the users see if they like it.

Question 14

Bilal is designing a new game app and has chosen to make it a web browser based app. This is an example of

A. an Internet application.

B. a rich client application.

C. a thin client application.

D. a peer to peer application.

Question 15

This quite short array is to be sorted with a selection sort. How many passes until we can be sure it is sorted?

Adam
Allesandra
Ali
Alyssa
Razan
Sienna
Zachariah
Charlotte
Tamara

A. 2

B. 3

C. 8

D. 9

Question 16

Stefan and Yvonne have been running a bingo hall for twenty years. Most of their clients are over 70 years old. Many use computers and love sending email jokes to all of their friends. Stefan and Yvonne have compiled a list of names, addresses and emails of most of their regulars. Yvonne regularly sends a compilation of jokes on Wednesday to everyone on her list and reminds them of the upcoming events. Recently, two of the dear old ladies have become quite sick and are not attending regularly. Everyone else has been asking about them and wanting to know why they are not answering emails. So Yvonne has been including medical updates in her weekly emails to reassure all of the other clients. Yvonne's friend, Louise, works in the local medical practice and keeps her up to date with all of the latest news. When Louise realised what Yvonne was doing she told Yvonne she must stop doing so because she is breaking the law. Which law is she breaking?

A. Spam Act 2003

B. Privacy Act 1988

C. Health Records Act 2001

D. Privacy and Data Protection Act 2014

Question 17

When writing algorithms and code, the use of meaningful variable names is

A. another form of Camel Case.

B. a way to help internal documentation.

C. a waste of CPU time and RAM storage.

D. only really useful if the programmer has the maintenance contract on the software.

Question 18

Test data for a computer program is usually developed during the

A. analysis stage.

B. design stage.

C. testing phase.

D. evaluation phase.

Question 19

Malek is intending to produce an app for use on a phone. He is thinking about screen designs and has a few different ideas. He will need some criteria to judge which screen design he should use. He should develop these criteria

A. before he does the designs.

B. after he completes the designs.

C. during the analysis phase and put them in his SRS.

D. as part of the development stage so he is not locked in too early.

Question 20

Alex is trying to develop criteria to evaluate the software solution that his team has developed. He has many effectiveness criteria from which to choose but he also wants to include efficiency criteria as well. Which of the below choices is an efficiency criterion?

A. Is the software easy to use?

B. Does the software do the task better than before?

C. How many times do the users have to check the answers?

D. How many wrong answers are produced on a fortnightly basis?

SECTION B – Short-answer questions

Instructions for Section B

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

Question 1 (3 marks)

A quick sort works well on a large number of items. It is less effective on a small number of items.

a. What sort is best used on a small number of items? 1 mark

_____

b. Why does that sort work better on a small number of items than a quick sort? 2 marks

_____

_____

_____

Question 2 (1 mark)

In a Level 0 Data Flow Diagram there are no circles drawn inside the system. Why?

_____

Question 3 (5 marks)

a. A Use Case Diagram has stick figure people outside the box.
What is the technical term for these? 1 mark

_____

b. A Data Flow Diagram has boxes outside the system circle.
What is the technical term for the boxes? 1 mark

_____

c. Explain why these two items are different. 3 marks

_____

_____

_____

Question 4 (6 marks)

As a part of the preparations to move their farm to computerisation, Louise and John have prepared a data dictionary to help with designing their software.

Field Name	Field Size	Data Type	Quantity
Animal			
Machine			
Feed (for animals)			

The farm has cows, chickens, goats and horses.

When Louise and John checked the dictionary, they found that the design would not work.

a. Explain the problem. 2 marks

_____

_____

_____

b. A farming friend suggested they use an XML file**.** Explain why this would not solve the problem.

2 marks

_____

_____

_____

c. Suggest a way to solve this issue. 2 marks

_____

_____

_____

Question 5 (5 marks)

Write an algorithm, using pseudocode, that takes a number in (`numberIn`), adds 4 to the number and if the result is bigger than 10 it subtracts 10 from the result and then returns the answer.

```
function changeTheNumber (numberIn)
begin
    _____
    _____
    _____
    _____
    _____
    _____
    _____
    Return (newNumber)
end
```

End of Section B

SECTION C – Case study

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.

Question 1 (5 marks)

Alannah wants to define the problems before she and Abrar start work on the project. Both women decide to spend two days observing and documenting the business operations (but not the actual wood cutting).

a. Abrar suggests that all orders should be done with an app on mobile phones. 2 marks

Suggest a technical constraint and an economic constraint on this idea

Technical _____

_____

Economic _____

_____

b. Alannah is happy to sub-contract the actual App development to a third party (using the Gig economy) as she believes that this will be more efficient than doing it herself.

Give three different efficiency reasons why this might be true. 3 marks

i. _____

ii. _____

iii. _____

Question 2 (8 marks)

Alannah and Abrar spend the next two days creating the SRS and working on the Project management plan. They bring in Corey to help brainstorm.

They decide to use a thin client app (unless Andrew disagrees).

a. Describe one advantage of using a thin client for the app. 1 mark

_____

_____

b. Describe a significant **dis**advantage of using a thin client for the app. 1 mark

_____

_____

Corey suggests that the payment details are taken immediately during the order process, although the client will not be charged until delivery.

c. Explain what Andrew will have to do with the payment data until delivery. 2 marks

_____

_____

_____

d. List one important functional requirement given that the clients will be providing personal data and payment details in the app. 1 mark

_____

_____

Andrew has a minimum delivery amount of 2 cubic metres (within 15 km). Then the next amounts are 5, 7 and 10 cubic metres. Over 15 km, the minimum delivery is 5 cubic metres.

These amounts need to be clear when clients order.

e. In what part of the SRS will these delivery amounts be put and why? 3 marks

SRS Part _____

Why? _____

_____

Question 3 (12 marks)

Now that the problem is defined and a solution has been proposed, Corey wants a project plan so that the team can make a quote based on the amount of work completed.

So, they begin to list the tasks in a Gantt Chart.

a. Shade the boxes and indicate where you think tasks require predecessors by using arrows.

8 marks

Task	**Time**																															
Define problem	2																															
Create SRS	2																															
Proj Management Plan	1																															
Submit SRS for Approval	0																															
Create 2 sketch designs	3																															
Submit for choice and approval	0																															
Create detailed design	3																															
Create Pseudo code	7																															
Test algorithm	2																															
Choose hardware	1																															
Design network access	1																															
Select developer	2																															
Finish Design	0																															
Develop App	7																															
Test app	3																															
Client testing	1																															
Implementation	2																															
Trouble shooting	3																															
Implemented and working	0																															
Evaluation	5																															
Finished	0																															

b. Some of the tasks that Corey added have a time of Zero. Why? 1 mark

_____

_____

c. Evaluation will not occur immediately after Trouble shooting so explain why it is put on the chart. 2 marks

_____

_____

d. **IF** everything goes according to Corey's plan, how long will it be from the start until the App is implemented and working? 1 mark

_____

_____

Question 4 (3 marks)

Corey has reminded the others that Evaluation Criteria for the success of the app need to be designed now – not after the app is finished.

a. Give an **efficiency** criterion for final evaluation of the app. 1 mark

_____

_____

b. Give **two effectiveness** criteria for final evaluation of the app. 2 marks

1. _____

_____

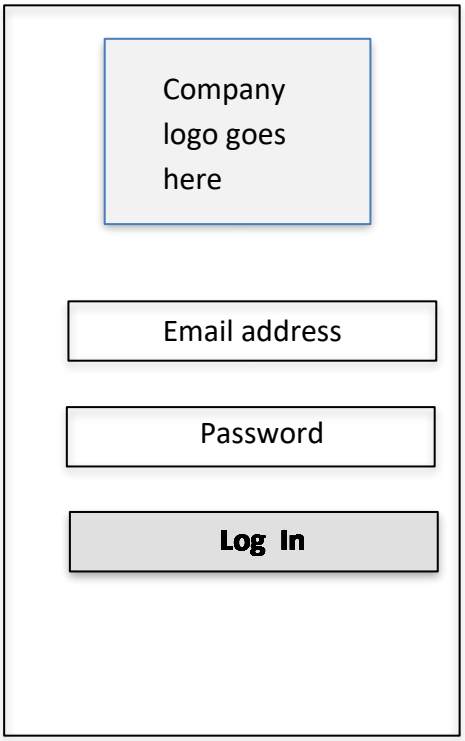
2. _____

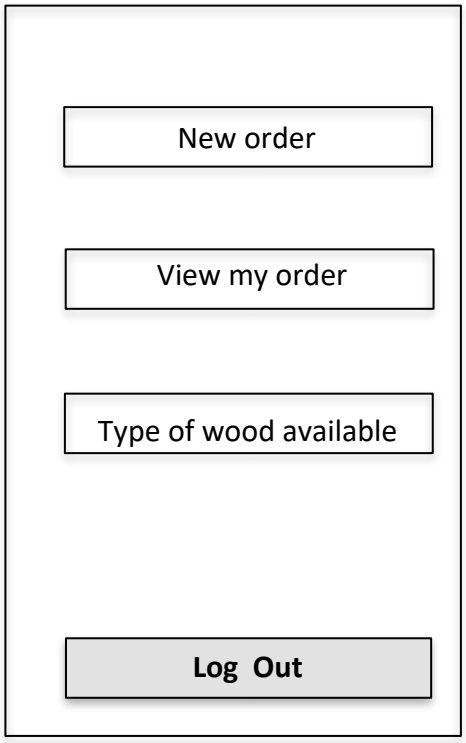
_____

Question 5 (5 marks)

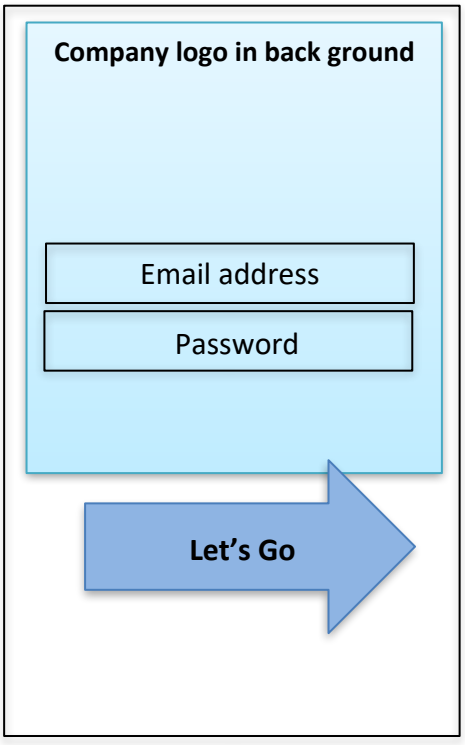
Alannah starts working on the screen designs. When she was observing Andrew, she noticed that he had difficulty with colour and with reading small text. Alannah has created two possible designs for the main screens of the app.

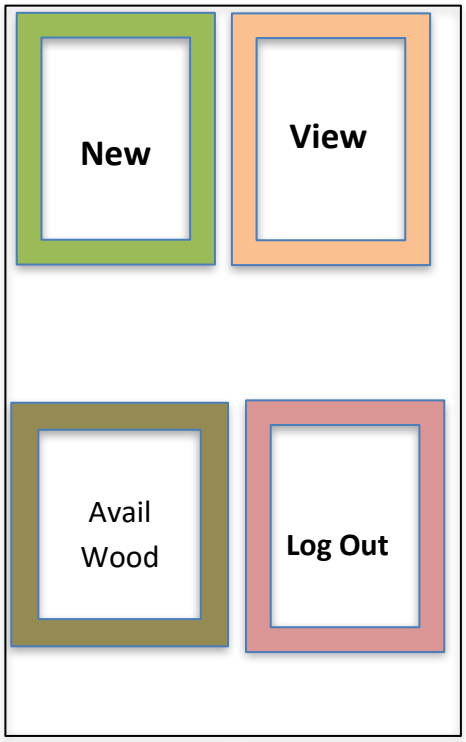
Design 1:





Design 2:





a. List two evaluation criteria that Alannah and Andrew can use for the screen designs.

2 marks

First _____

_____

Second _____

_____

b. Using the two criteria you developed, recommend a screen design for the app. 3 marks

_____

_____

_____

_____

_____

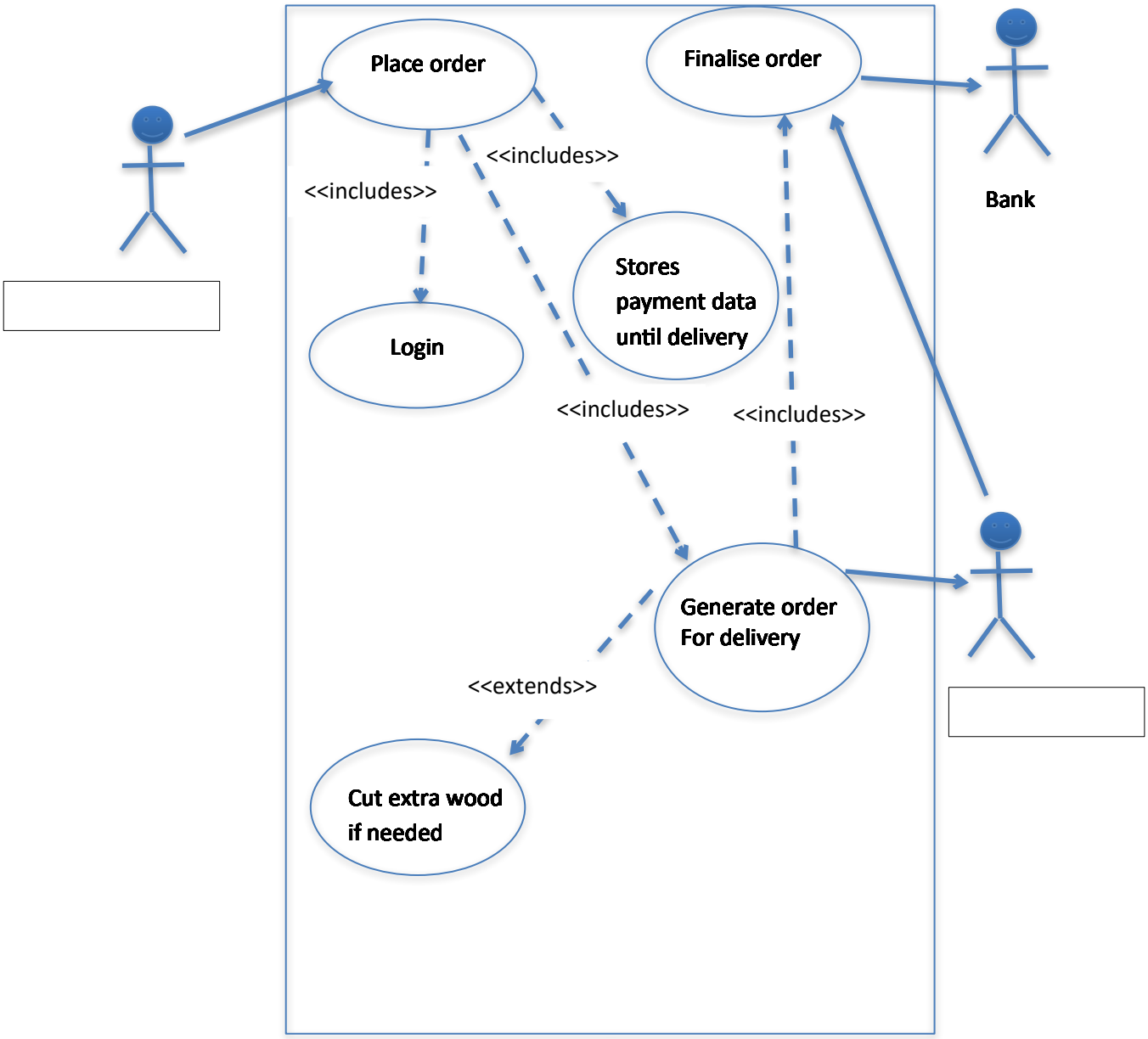
_____

Question 6 (3 marks)

Corey wants a Use Case Diagram before they start on screen design. Abrar makes a start (shown below) but needs help before she shows it to Corey.

a. Complete the Diagram by writing your answers directly on the diagram. 2 marks

b. Also check if Abrar has the <<includes>> and <<extends>> correct. 1 mark



Question 7 (3 marks)

In the early phase of using the app for orders, Andrew will be gathering the data onto someone else's server. He will then have it sent to him in the form of an XML file so that he will not have to completely change the software to read his file as he upgrades the app or adds features..

This is an example file:

```
<?xml version="1.0" encoding="UTF-8"?>
      <orders>
            <customer>
                  <name>Tulip Evergreen</name>
                  <address>
                        <street> 12 birch st </street>
                        <town>  Wollert </town>
                        <ph> 0441 010 202 </ph>
                  </address>
            </customer>
            <quantity> 7 </quantity>
            <type> red gum </type>
            <customer>
      --etc  -- More customers in here
            </customer>
      </orders>
```

a. The **element** customer has a number of parts. What are these parts called? 1 mark

_____

_____

b. The data labelled <ph> is what data type? 1 mark

_____

_____

c. If the app is only ever going to be used in Victoria in Australia, the data type of postcode could be Number (not great but could work). If Corey, Alannah and Abrar decide to put it for sale worldwide then Number is not going to work. Why? 1 mark

_____

_____

Question 8 (6 marks)

Abrar has developed the part of the algorithm to validate the quantity of wood ordered.
Her version is shown below.

```
begin
    input  type_of_wood
    input quantity
    input travel_distance
    if  quantity < 2  then
        Display "We will not deliver a low quantity"
    else
        if  quantity = 2  or travel_distance <= 15  then
            display  "2 cu metres ordered"
        else
            if quantity = 5  or travel_distance > 15  then
                display  "5 cu metres ordered"
            else
                if quantity = 7  then
                    display  "7 cu metres ordered"
                else
                    if quantity = 10  then
                        display  "10 cu metres ordered"
                    else
                        display "Please only choose 2, 5, 7, or 10"
                    endif
                endif
            endif
        endif
    endif
end
```

a. Complete the test table below. 3 marks

quantity	travel_distance	Expected Result	Actual Result
1	5	`We will not deliver a low quantity`	`We will not deliver a low quantity`
10	16	`10 cu metres ordered`	`5 cu metres ordered`

b. There appear to be a number of errors in this algorithm. 3 marks

Rewrite ONLY the lines that need fixing.

_____

_____

_____

Question 9 (1 mark)

After Abrar finally fixed the problems with the algorithm, Corey checked it over. He suggested that she use drop down boxes to select the amount of wood and that she automatically calculate travel distance from the address given by the customer and only populate the drop down box with allowable amounts.

This type of data checking is called _____

Question 10 (6 marks)

As part of the preparations for taking credit card payments, Andrew has contacted the bank. The bank officer is concerned about how Andrew will be storing the credit card data until the delivery is made.

Corey has already decided this data will be stored as encrypted data using the bank's public key.

a. Describe what encryption does. 2 marks

_____

_____

b. Why is encryption useful? 2 marks

_____

_____

c. What is a public key? 1 mark

_____

_____

d. Why can't Andrew read the data stored on his server using the bank's public key? 1 mark

_____

_____

Question 11 (6 marks)

The app is now in use. Andrew is happy and he calls back the team (Alannah, Abrar and Corey) to conduct the evaluation.

a. Describe a simple strategy to test the efficiency criteria with using the app. 2 marks

_____

_____

_____

_____

b. Describe a more complex strategy to test the effectiveness criteria of the app. 4 marks

_____

_____

_____

_____

_____

_____

Question 12 (2 marks)

As part of the evaluation, the team look back at the project plan as it was originally written and how it changed during the project.

Describe how understanding the reasons why the plan changed will be useful to the team when they begin their next team project.

_____

_____

_____

_____

_____

_____

END OF QUESTION AND ANSWER BOOK

Insert for Section C – Case study

Please remove from this book during reading time.

A few years ago, Andrew and his family moved to the country to have a "tree change" away from the fast pace of life and the smog of Melbourne. The house that they purchased is solely heated by burning wood. As part of country life, Andrew decided to cut his own wood. After two years of hard work, Andrew discovered that he liked being in the forest and cutting wood. So he cut more wood and started selling it to other people. Within a year, Andrew decided that this was better than teaching in a secondary school. He was earning reasonable money and getting fit. He quit teaching and expanded the wood cutting and selling business.

As always, expansion of a business brings problems. The two most pressing problems Andrew has are taking orders and making deliveries. He would also like to make payments more reliable as he has delivered wood to a client who has not paid him on delivery.

Andrew has sought help from some programmers he knew from when he was a teacher. Abrar and Alannah have agreed to help.

END OF CASE STUDY INSERT

VCE Computing: Software Development NAME: _____

Section A: Multiple Choice Answer Sheet

For each multiple-choice question, shade the letter of your choice.

Question				
1	A	B	C	D
2	A	B	C	D
3	A	B	C	D
4	A	B	C	D
5	A	B	C	D
6	A	B	C	D
7	A	B	C	D
8	A	B	C	D
9	A	B	C	D
10	A	B	C	D
11	A	B	C	D
12	A	B	C	D
13	A	B	C	D
14	A	B	C	D
15	A	B	C	D
16	A	B	C	D
17	A	B	C	D
18	A	B	C	D
19	A	B	C	D
20	A	B	C	D

QATs
Quality Assessment Tasks

Solution Pathway

NOTE: This task is sold on condition that it is NOT placed on any school network or social media site (such as Facebook, Wikispaces, etc.) at any time. NOT FOR PRIVATE TUTOR USE.

Below are sample answers. Please consider the merit of alternative responses.

SECTION A – Multiple-choice questions

Question	Answer	Comments
1	*D*	Support is the active verb so FR.
2	*C*	Milestones are significant.
3	*A*	Removed to NOT main database – not just copied.
4	*A*	
5	*D*	
6	*B*	Zero based array.
7	*B*	Keep is a FR verb.
8	*B*	Tricky because zero based.
9	*A*	No selection.
10	*C*	0.7MB=5.6Mbps x15 sec →84Mbits @9Mbps =9.3333 sec.
11	*D*	A is correct, b is correct so … C ignores randomness of pivot point.
12	*B*	Record contains data of various types.
13	*C*	The user uses it before it is implemented.
14	*A*	Browser based so Internet.
15	*B*	2 passes to sort it and 1 more with no changes to ensure it is sorted =3
16	*C*	Can't reveal medical knowledge gained under "privilege".
17	*B*	Meaningful variable names is a part of Internal Documentation.
18	*B*	PSM model as per VCAA description.
19	*A*	Before, otherwise criteria will be chosen to favour a particular design.
20	*C*	Only mention of time, cost or **effort. The others are all effectiveness.**

SECTION B – Short-answer questions

Question 1 (1 + 2 marks)

a. *Selection.*
b. *Quick sort uses partitioning and recursion. Selection sort just uses iteration. So, with less than about 15 items, selection is quicker.*

1 mark for quick sort description. 1 mark for comparison.

Question 2 (1 mark)

Level 0 is a context diagram. It only shows external entities and data flows that cross the system boundary.

Question 3 (1 + 1+ 3 = 5 marks)

a. *The technical term for this is 'actors'.*
b. *The technical term for the boxes is 'external entities'.*
c. *Actors represent actual users.* (1 mark) *External entities can be corporations, organisations, etc. such as a bank.* (1 mark) *The external entities are not actual users of processes inside the system.* (1 mark)

Question 4 (2 + 2 + 2 = 6 marks)

a. *Louise and John cannot list different types of animals. They can just list a generic animal.* (1 mark) *This means that they cannot identify separate animals.* (1 mark) The data dictionary is flawed. It looks reasonable but it does not actually do any of the required tasks. There could be a variety of answers to this question. As it is only 2 marks, students are only expected to find a reason why it will not do the required task.
b. *An XML file is a file! It is secondary storage* (1 mark). *Even if the data was stored like an XML file, when it is input into the array it reverts to just animal.* (1 mark)
c. *Revise the data dictionary* (1 mark), *so that it can show different types of animals, machines, feed, etc.* (1 mark)

Question 5 (5 marks)

1 mark for correct indenting.

1 mark for adding 4 – must use assignment arrow (←) not equals sign (=)

1 mark for if statement (include **endif**) MUST be > not >=

1 mark for subtract 10 → must use assignment arrow (←) not equals sign (=)

1 mark for variable names used exactly as given

Sample high level response:

```
function changeTheNumber (numberIn)
begin
     newNumber ← numberIn + 4
     If  newNumber > 10 then
          newNumber ← newNumber – 10
     endif
    return (newNumber)
end
```

SECTION C – Case study

Question 1 (2 + 3 = 5 marks)

a. Technical - *Screen size will limit information display.* (1 mark)
Economic - *Variety of mobile phones and screen sizes means coding must be done at a higher quality to be able to adjust to actual screen size.* (1 mark)

b.
- **i.** *Alannah will take longer to code as she has less experience.* (1 mark)
- **ii.** *The third party will be cheaper per hour than Alannah.* (1 mark)
- **iii.** *Alannah will have to research how to adjust to screen sizes on the fly. This will take some time to learn about and then to do.* (1 mark)

Question 2 (1 + 1 + 2 + 1 + 3 = 8 marks)

a. *Smaller app size* (1 mark) OR *independent of processing power of device* (1 mark) OR *processing occurs server side.* (1 mark)
b. *Must have Internet connection* (1 mark) OR *data is stored on server.* (1 mark)
c. *He will have to encrypt payment data* (1 mark) *and save to a secure storage.* (1 mark)
d. *Communication between server and device must be secured / encrypted.* (1 mark)
e. SRS Part *Constraints* (1 mark)

Why: *These are restrictions on orders* (1 mark) *and on delivery and payments.* (1 mark)

Question 3 (8 + 1 + 2 +1 = 12 marks)

a. 5 marks awarded for appropriate shading and 3 marks for predecessor lines.

Task	Time	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1	2	3	4
Define problem	2																																		
Create SRS	2																																		
Project Management Plan	1																																		
Submit SRS for Approval	0																																		
Create 2 sketch designs	3																																		
Submit for choice and approval	0																																		
Create detailed design	3																																		
Create Pseudo code	7																																		
Test algorithm	2																																		
Choose hardware	1																																		
Design network access	1																																		
Select developer	2																																		
Finish Design	0																																		
Develop App	7																																		
Test app	3																																		
Client testing	1																																		
Implementation	2																																		
Trouble shooting	3																																		
Implemented and working	0																																		
Evaluation	5																																		
Finished	0																																		

b. *They are milestone tasks with zero duration. They just mark a significant point in the project.* (1 mark)

c. *Evaluation must be planned as part of the project* (1 mark) *and resources and time need to be allocated for it.* (1 mark)
d. *It will be the end of the 29th day or a total of 30 days (the same but one sounds better!) from the start until the App is implemented and working.* (1 mark)

Question 4 (1 + 2 = 3 marks)

a. *It saves Andrew time in taking orders.* (1 mark)
b. *Is Andrew paid for every delivery?* (1 mark) *Do clients find it easy to use?* (1 mark)

Question 5 (2 + 3 = 5 marks)

a. *Is it easy to understand on a phone?* (1 mark) *Is it user friendly?* (1 mark)
b. *Design 1 is easy to understand because it has lots of text to explain. However, that makes it hard to read for people with vision problems.* (1 mark)

Design 2 is simple, with very few words and each is fairly obvious. The arrows and blocks are large, easy to see and work well with large fingers. (1 mark)

Design 2 is recommended. (1 mark)

This question has many possible answers as the student criteria for part **a** leads to part **b**. Teacher judgement is required.

Question 6 (2 + 1 = 3 marks)

a. *customer (on left)* (1 mark) *and Andrew (on right)* (1 mark)
b. *the <<extends>> at the bottom should be an <<includes>>* (1 mark)

Question 7 (1 + 1 + 1 = 3 marks)

a. *These parts are called 'attributes'.* (1 mark)
b. *It is a 'string'.* (1 mark)
c. *Outside Victoria, there are variations. For example, Northern Territory postcodes start with a zero* (1 mark) OR *English and Canadian postcodes have both letters and numbers.* (1 mark)

Question 8 (3 + 3 = 6 marks)

a. 1 mark for each two correct → 7 correct gives 3 marks. Final mark needs 3 lines correct.

quantity	travel_distance	Expected Result	Actual Result
1	5	We will not deliver a low quantity	We will not deliver a low quantity
2	*15*	*2 cu metres ordered*	*2 cu metres ordered*
2	*16*	*Please only choose 2,5,7,or 10*	*2 cu metres ordered*
5	*15*	*5 cu metres ordered*	*2 cu metres ordered*
5	*16*	*5 cu metres ordered*	*5 cu metres ordered*
7	*15*	*7 cu metres ordered*	*2 cu metres ordered*
7	*16*	*7 cu metres ordered*	*5 cu metres ordered*
10	15	*10 cu metres ordered*	*2 cu metres ordered*
10	16	10 cu metres ordered	5 cu metres ordered

b.
```
if  quantity = 2  and travel_distance <= 15  then
      if quantity = 5 then
   display "Please only choose 2 (if 15 km or less), 5, 7, or 10"
```

Question 9 (1 mark)

Choosing from a list; choosing from only correct items. (1 mark)

This is not explicitly in study design.

Question 10 (2 + 2 + 2 + 1 + 1= 6 marks)

a. *Encryption changes text into cypher text* (1 mark) *and, with the key, it changes it back to ordinary text.* (1 mark)
b. *Encryption prevents those without the key from reading the text* (1 mark) *and it allows payments using insecure channels (such as WiFi) because the data is encrypted.* (1 mark)
c. *A public key is an encryption key that is distributed. It can encode data but not decode.* (1 mark)
d. *Andrew needs the bank's private key to decode the data* (1 mark) *because of asymmetric encryption.*

Question 11 (2 + 4 = 6 marks)

a. *A strategy to test the efficiency criteria is to compare the time that Andrew spent on taking orders* (1 mark) *from before the app and with the app.* (1 mark)

b. A complex strategy should include all of who, what, where, when, why, how.
Award 1 mark per two of these included (3 marks for all six aspects of a complex strategy).
Award 1 mark if the student has used criteria from Part C, Question 4.

Sample response:

Survey clients about whether they find the app easy to use. Engage with the clients while they are using the app and send follow up survey immediately after delivery via email or via the app. Collate the answers to determine whether clients are finding the app easy to use. (4 marks)

OR

Have Andrew note whether any payments fail. Follow up via phone, email or via the app with those clients to determine the reason for failure and whether the client will make a payment that will be honoured. (4 marks)

Question 12 (2 marks)

Understanding the reasons why the plan changed gives a better understanding of time per task for the next time that the team does a project. (1 mark)

It also gives a better idea of how to plan in future, such as where to leave slack time (1 mark) *and how changes on the critical path have an effect.*