

THIS BOX IS FOR ILLUSTRATIVE PURPOSES ONLY

2020 Examination Package - Trial Examination 7 of 7

STUDENT NUMBER

Figures

Words

Letter

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SOFTWARE DEVELOPMENT

Units 3 & 4 – Written examination

(TSSM's 2019 trial exam updated for the current study design)

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	10	10	60
			Total 100

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

Materials supplied

- Question and answer book of 24 pages.
- Insert.

Instructions

- Print your name in the space provided on the top of this page.
- All written responses must be in English.

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

SECTION A– Multiple-choice questions

Instructions for Section A

Answer **all** questions in section A.

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

Rose is collecting data from the users of a solution to check the level of satisfaction with the new pay roll solution. Rose is at the:

- A. analysis stage.
- B. design stage.
- C. development stage.
- D. evaluation stage.

Question 2

Maddy is adding a range check to the input fields of a membership form. The validation technique she needs to apply before adding a range check is:

- A. a type check.
- B. an existence check.
- C. an integer.
- D. an acceptance check.

Question 3

The functional requirement for a coffee app would be:

- A. users can select coffee and other drinks.
- B. it takes no longer than 3 months to develop.
- C. clients can change the number of coffees and edit their orders if they make mistakes.
- D. it can be used in any smart phone.

Question 4

Cameron, a developer, has been asked to write a module of code within a program for a nursery that calculates a discount for retirees between the ages of 65 and above for each purchase they make and return the discount amount of each purchase. The segment of code that is used would be referred to as:

- A. an event.
- B. an iteration.
- C. a function.
- D. a method.

SECTION A - continued

SOFTWARE DEVELOPMENT EXAM

Use the following information to answer questions 5-6

JVD Electronics specialises in the sale of drones. Below are the details for some of the drones stored in their database.

Name	Price (\$)	No of rotors	Video resolution (p)	Dimension (inches)	Weight (Kg)	RemoteControl
PQI Phantom 4	1501	1	720	7 x 11.5 x 11.5	1.3	Yes
PQI Inspire 2	1500	6	1080	12.5 x 16.7 x 16.7	3.2	Yes
PQI Phantom 4 Pro	1499	4	720	7 x 11.5 x 11.6	1.4	Yes

Question 5

The best data type for the *Dimension* and *RemoteControl* fields respectively is

- A. string and Character.
- B. string and Boolean.
- C. float and Boolean.
- D. string and Float.

Question 6

One of the main constraints with drones is:

- A. the descending speed.
- B. the ascending range.
- C. the battery life.
- D. the distance.

Question 7

Greg developed a program for a toy shop which calculates the total price and a discount, if applicable. Which of the following criteria would be suitable for the evaluation stage?

- A. Is the calculation for the discount accurate?
- B. Is there a message warning the user of an error input?
- C. Is the user interface clear and easy to use?
- D. Do the validation techniques applied to the fields work?

SECTION A - continued
TURN OVER

Question 8

Andree is looking for a simple app for her iPhone which will display the number of steps, kilometres and calories burnt while walking. This app will store the data and therefore, she can check the history of her daily walks. The main non-functional requirements of this program are

- A. Ease of use, response rate.
- B. Portability, maintainability.
- C. Response rate and calculation of number of steps.
- D. The ability to calculate the number of steps.

Question 9

Conventionally, in one-dimensional arrays indices start at:

- A. 0.
- B. 1.
- C. any number or letter.
- D. any number, if it is defined.

Question 10

The difference between a constant and a variable is:

- A. constants' values do not change but variables' values do.
- B. constant do not need to be declared.
- C. constants' values will change depending on the code while variables' values change all the time.
- D. variables are used in the main body of code, while constants are used in functions.

Question 11

A selection sort will perform many comparisons. The number of passes and swaps can be calculated by:

- A. n^2 passes and n^2 swaps.
- B. n^2 passes and $n-1$ swaps.
- C. $n-1$ passes and $n-1$ swaps.
- D. it cannot be determined.

Question 12

The term 'specification creep' refers to:

- A. modules taking longer than expected.
- B. clients adding new features to the requirements while the solution is being developed.
- C. milestones that must be removed because the modules are taking longer than expected.
- D. the lack of software integration which may lead to problems cropping up.

SECTION A - continued

Question 13

_____ are produced in the design stage.

- A. The solution design and constraints
- B. Evaluation criteria and informal testing
- C. The solution design and evaluation criteria
- D. Evaluation criteria and the scope

Question 14

In a DFD:

- A. a rectangle represents a store.
- B. an arrow represents a data flow.
- C. a rectangle represents the system boundary.
- D. an oval represents a use case.

Question 15

Which software development model has the most customer interaction during the life of the project?

- A. Waterfall Model
- B. Agile Model
- C. Spiral Model
- D. None of the above

Question 16

A small fitness club has asked their new members to provide their tax file numbers to use as their membership IDs. Which law is the club is breaking?

- A. The Privacy Act 1988
- B. The Charter of Human Rights and Responsibilities 2006
- C. The Privacy and Data Protection Act 2014
- D. The Copyright Act 1968

Question 17

Which of the following statements is true about project management?

- A. If the project goes over time, it will not increase the budget.
- B. A flow chart is used to show the timeline of the project.
- C. The critical path can have slack time.
- D. A milestone indicates the completion of a significant task in a project.

SECTION A - continued
TURN OVER

SOFTWARE DEVELOPMENT EXAM

Question 18

An Object Description table helps the developer with the planning of the structure and content of objects. This contains:

- A. name, type, size, scope, description.
- B. name, type, event, description.
- C. the layout of the UI with objects and properties.
- D. storage type, object, platform, programming language, authentication method.

Use the following information to answer questions 19 and 20.

The array below contains the names of 17 countries.

Argentina

Austria

Bolivia

Brazil

Chile

Colombia

Ecuador

France

Netherlands

Norway

Peru

Poland

Portugal

Romania

Spain

Ukraine

Uruguay

Question 19

Using a binary search to find the country “Uruguay” in the array will require _____ comparisons.

- A. 2
- B. 4
- C. 5
- D. 17

SECTION A - continued

Question 20

How many comparisons will take place to find the country “Uruguay” using a linear search?

- A. 2
- B. 4
- C. 5
- D. 17

**END OF SECTION A
TURN OVER**

SECTION B - Short-answer questions**Instructions for Section B**

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

Question 1 (8 marks)

Myriam owns a family parcel delivery service in a small country town. She ensures that parcels are delivered on the day customers drop them off at her office. Myriam charges a standard fee of \$15.00 for packages that weigh 10 kgs or less. If this condition is met the parcel is considered 'parcel accepted'. However, if the condition is not met, the parcel will be considered 'parcel rejected'.

```
If parcelWeight > 10 then
    Display ("parcel accepted")
Else
    Display ("parcel rejected")
EndIf
```

a. Complete the test table below.

3 marks

Test Number	ParcelWeight	Expected result	Actual result
1	9		
2	10		
3	11		

b. Identify the error in the pseudocode.

1 mark

SECTION B – Question 1 - continued

SOFTWARE DEVELOPMENT EXAM

c. Rewrite the correct pseudocode. 1 mark

d. What control structure can you identify in the pseudocode? 1 mark

e. Explain how this control structure works. 2 marks

Question 2 (2 marks)

Prove or refute the following statement: *'If your data/information is protected there is no chance of data/information being damaged.'*

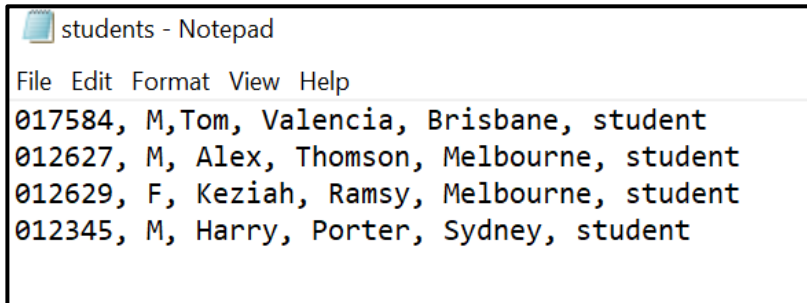
SECTION B – continued
TURN OVER

SOFTWARE DEVELOPMENT EXAM

Question 3 (4 marks)

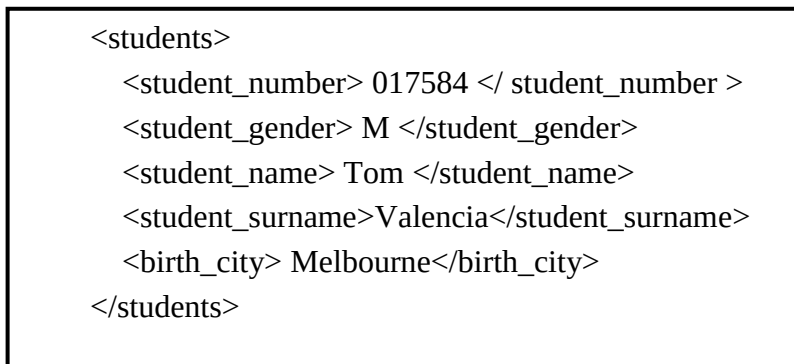
The two extracts below are from two data files that store data about students from an application.

File A



```
students - Notepad
File Edit Format View Help
017584, M, Tom, Valencia, Brisbane, student
012627, M, Alex, Thomson, Melbourne, student
012629, F, Keziah, Ramsy, Melbourne, student
012345, M, Harry, Porter, Sydney, student
```

File B



```
<students>
  <student_number> 017584 </ student_number >
  <student_gender> M </student_gender>
  <student_name> Tom </student_name>
  <student_surname>Valencia</student_surname>
  <birth_city> Melbourne</birth_city>
</students>
```

- a. File A format is an extract from a csv file. While File B is of a different file format. Identify and describe the type of file contained in File B.

2 marks

SECTION B – Question 3 - continued

SOFTWARE DEVELOPMENT EXAM

b. Explain two advantages of using file B.

2 marks

Question 4 (4 marks)

List the four sections of the SRS.

Question 5 (2 marks)

Explain the difference between http and https protocols.

**END OF SECTION B
TURN OVER**

SECTION C- Case study

Instructions for Section C

Please remove the insert from the back of this book during reading time. Use the case study provided in the insert to answer the questions in this section. Answer all the questions in the spaces provided.

Question 1 (4 marks)

- a.** Identify an organisational goal that '*Petals 4 U*' would like to achieve. 1 mark

- b.** Identify a system objective that the new solution will meet. 1 mark

- c.** Identify a functional and a non-functional requirement for the new system. 2 marks

Functional: _____

Non-functional: _____

SECTION C – continued

SOFTWARE DEVELOPMENT EXAM

Question 2 (7 marks)

Matt and his team have completed the analysis stage of the solution and now they are adjusting their plan for the design and development stages.

			1	2	3	4	7	8	9	10	11	12	13	14	15	16	17
TASK ID	TASK	Duration (days)															
A	Design the app	4															
B	Develop the app	8															
C	Test the app	1															
D	Setup the webserver	2															
E	Create database	2															
F	Input data in database	2															
G	Test the whole system	1															
H	User acceptance	1															

a. Explain how long this project will take.

2 marks

b. If task A is delayed by two days what are the implications for this project?

1 mark

c. List two advantages of using a Gantt chart.

2 marks

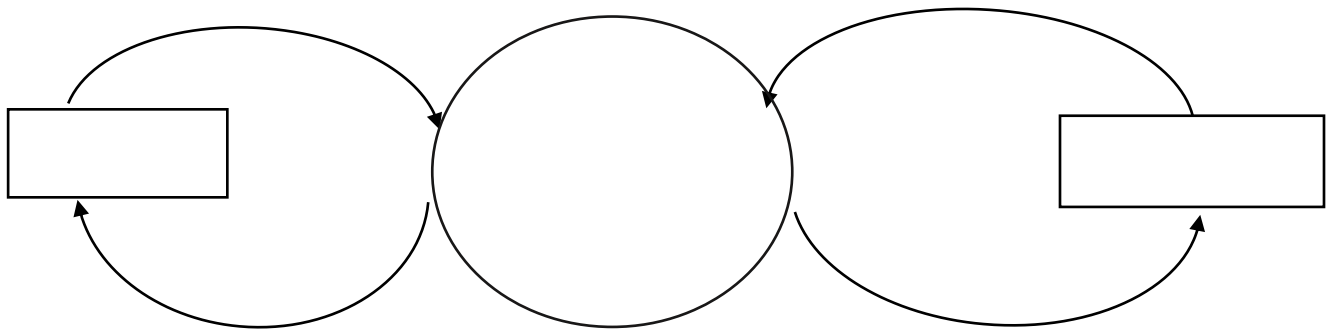
SECTION C- Question 2 - continued
TURN OVER

- d. List and explain a technique Matt could use to keep track of this project. 2 marks

Question 3 (7 marks)

- a. Explain the purpose of a context diagram. 2 marks

- b. Complete the context diagram for the current system, identify the main system, the entities and two data flows. 5 marks



SECTION C – continued

SOFTWARE DEVELOPMENT EXAM

Question 4 (8 marks)

Below is the form that Andrea uses in her current system to take orders from her clients.

JAN — **ORDER FORM** SAT

Date: / / Delivery Date: SAT / 1 / 2019

A/C to Name: TANYA + ANTHONY WEDDING.

Address: _____

Postcode: _____

Attention: _____ No: _____

Phone (Home): _____ (Work): _____

B/C M/C

Visa No.

Authority Expiry Date

Amex

Authority Expiry Date

Delivery to:

Name: _____

Address: _____

Suburb: _____ Phone: _____

Message/Special Instructions: _____

SAT

SAT JAN x 25 button holes

x 2 corsages

x 1 BRIDAL

x 4 BRIDESMAIDS

x 1 flower girl.

Require: _____

Order taken by: _____ + Delivery fee \$ _____

These are some of the floral arrangements for a wedding.

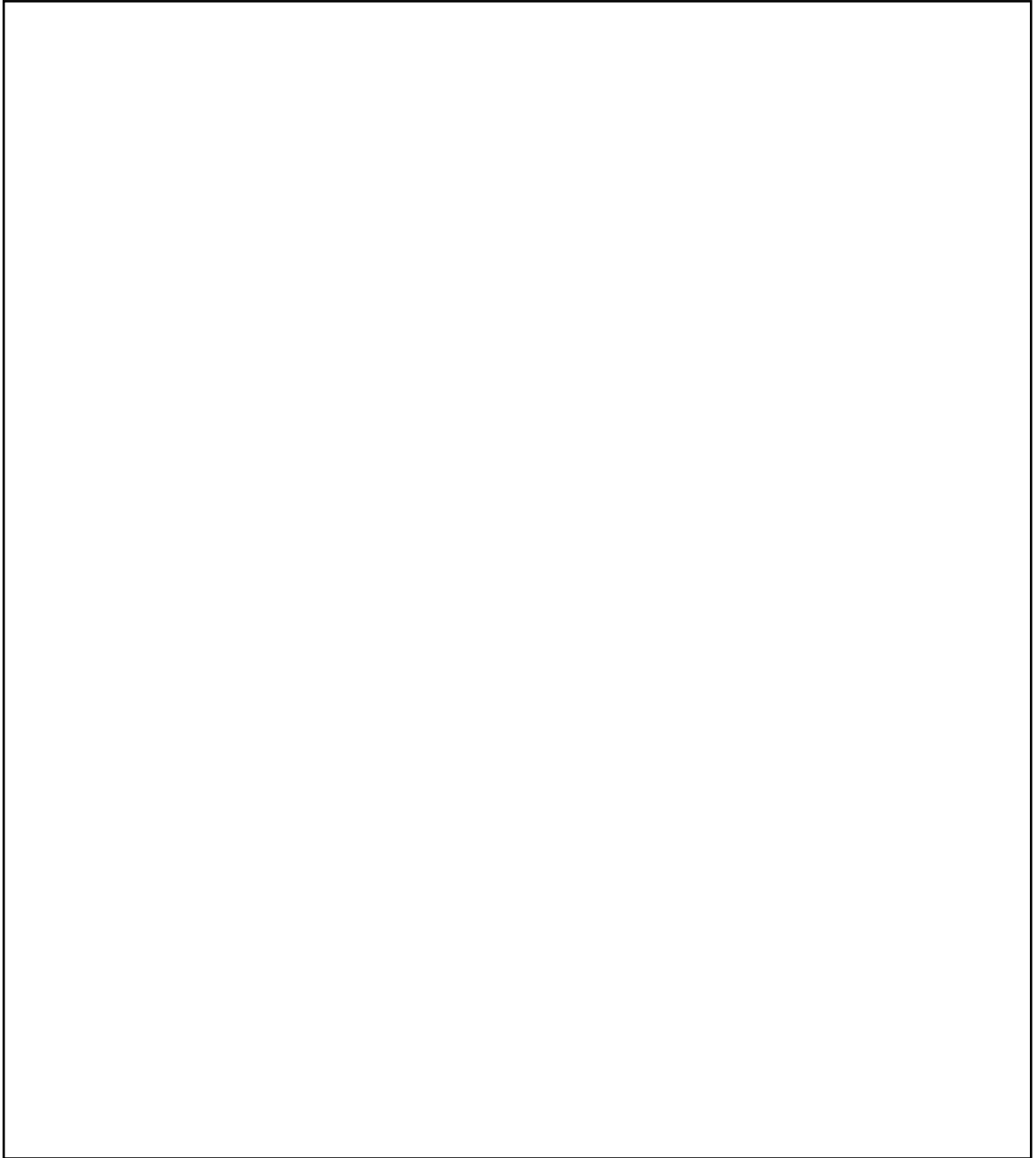
- Buttons holes
- Corsages
- Bridal
- Bridesmaids
- Flower girl

Matt has already designed the user interface (UI) into three separate screens, one for the clients' details, the other one for ordering flowers and the last one for payment. He has completed the first screen and he is now about to start the mock-up for the ordering screen.

SECTION C – Question 4 - continued
TURN OVER

SOFTWARE DEVELOPMENT EXAM

- a.** Draw a mockup for the ordering form that Matt could consider. This should show the layout of the proposed solution so that the developer can easily convey the UI and the way it will operate. 4 marks



SECTION C – Question 4 - continued

- b.** Explain the effectiveness of this design by referring to the mock-up produced. 2 marks

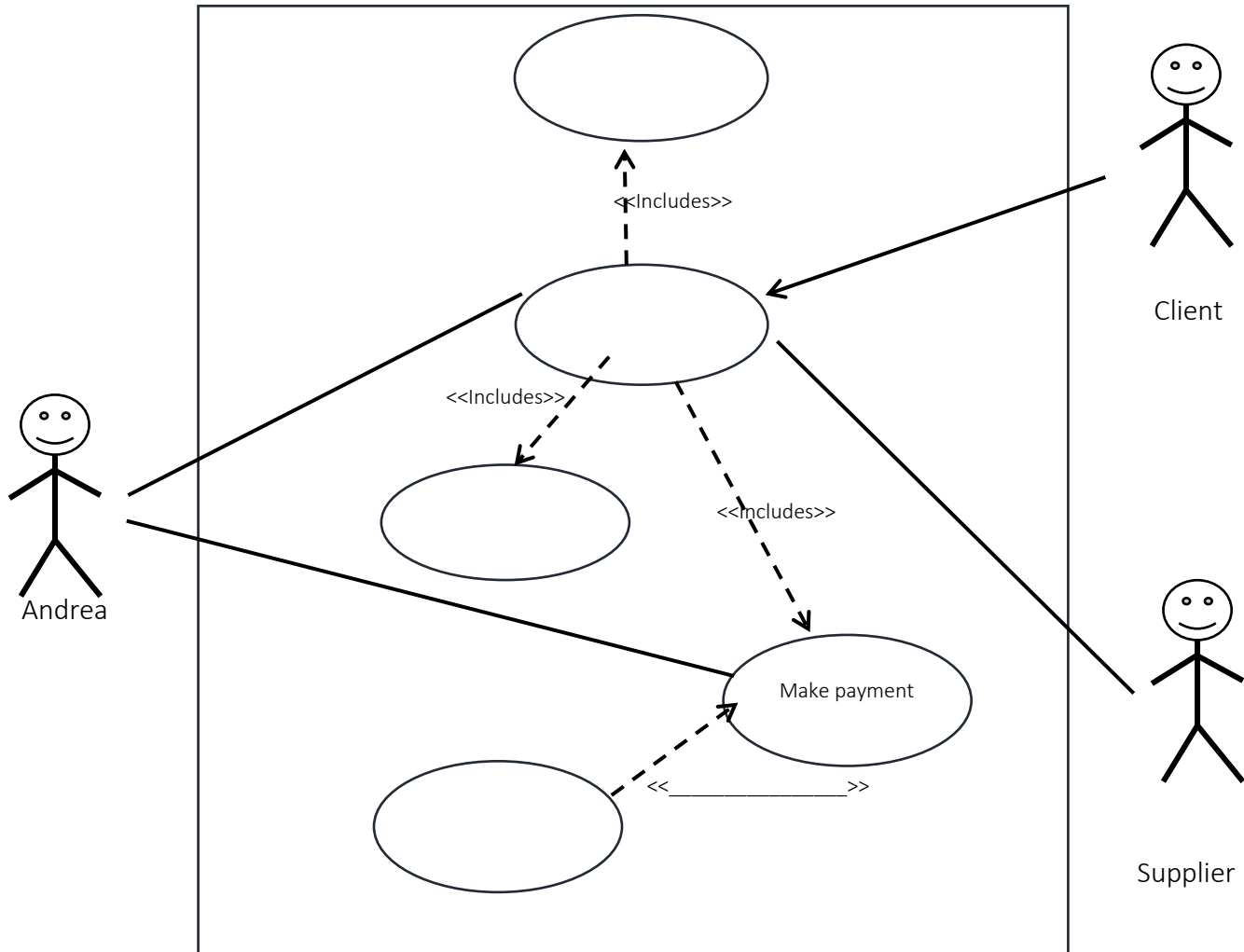
- c.** Explain the efficiency of this design by referring to the mock-up produced. 2 marks

SECTION C – continued
TURN OVER

Question 5 (7 marks)

- a. Complete the use case diagram for the new system below by using five of the words provided in the table below. 5 marks

Login/register	<<includes>>	Browse arrangements	Pick up flower arrangement/s	<<extends>>	Place order
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SECTION C – Question 5 - continued

b. Identify what is wrong with this use case diagram.

1 mark

c. Indicate how you would fix it.

1 mark

Question 6 (4 marks)

Identify and describe one accidental and a deliberate threat to the integrity and security of data for 'Petal 4 U'.

Accidental:

Deliberate:

SECTION C - continued
TURN OVER

Question 7 (4 marks)

Identify and explain two security techniques that ‘*Petals 4 U*’ could use to protect their clients’ rights.

1. _____

2. _____

Question 8 (8 marks)

Andrea is aware of the privacy laws in Australia and how she must protect her clients’ sensitive data. She values data as an asset for her business, thus she asks Matt about backups. He recommends using a Cloud service.

a. Explain to Andrea what cloud computing is.

2 marks

SECTION C – Question 7 - continued

SOFTWARE DEVELOPMENT EXAM

- b.** State one advantage and one disadvantage of using a cloud service.

Advantage:

1 mark

Disadvantage:

1 mark

- c.** Matt suggests an incremental and a full back up in the cloud. Andrea is only interested in the full back up. Explain to Andrea what is an incremental back up and the importance of having both the incremental and a full back up in place. 4 marks

SECTION C – continued
TURN OVER

Question 9 (4 marks)

Matt completed the formal testing of the new system and he is pleased with the results. He is now ready to carry out the acceptance testing. Matt has asked Andrea to be involved in the acceptance testing. However, she tells him it is not necessary as he has already completed the formal testing.

- a.** Explain to Andrea what ‘*acceptance testing*’ is and why she needs to be involved in this activity. 2 marks

- b.** Explain the purpose of formal testing and what involves. 2 marks

SECTION C – continued

Question 10 (7 marks)

After a couple of months, Andrea wants to determine if the number of orders has increased with the new system and see if her clients are satisfied with the new solution.

- a.** Outline a strategy Andrea could use to determine the increase in the number of orders?

4 marks

- b.** Identify and describe the collection method Matt could use to gather data about '*Petals 4 U*' clients' satisfaction.

Data collection: _____

2 marks

- c.** Matt tells Andrea that it is too early to determine the success of the system. Indicate when it should take place.

1 marks

END OF QUESTION AND ANSWER BOOK

Insert for Section C – Case study

Please remove from this booklet during reading time

Petals 4 U

After studying Interior Design and Decoration at a prestigious institution, Andrea went to live in Europe for over a year. On her return to Melbourne, she realised how passionate she was about designing and creating hence decided to set up her own business, '*Petals 4 U*', at the start of 2018. Petals 4 U has been running from her mother's pergola at the back of her house. Since the launch of her business, the demands for her services have increased greatly. Clients can order flowers via Instagram, Messenger, text messages and direct calls to her mobile.

Her business' goal is to provide clients with the most marvellous and freshest flowers at a reasonable price. Andrea buys flowers and greeneries directly from growers and suppliers so that she can greatly decrease the cost and provide a much healthier product for her clients. She deals with her clients directly to ensure that all floral arrangements are designed to detail. Her clients can pick up the flowers themselves or have them delivered to the address provided. If deliveries are nearby within 10 kms, the cost for delivery is \$10.00. Otherwise, the charge is \$30.

Andrea's clients are satisfied with the quality of the service received and provide positive feedback for her business. '*Petals 4 U*' have grown so much in just one year that she now caters for different events such as wedding, opening ceremonies, installations, ballet shows and others. Furthermore, she offers workshops for making floral arrangements, headbands and wreaths. '*Petals 4 U*' also supports charities by making floral arrangements for their events.

Since the opening of her business, Andrea has been recording her clients' orders on paper forms and keeping all costs in a spreadsheet. She is now ready to expand her business and improve the handling of her clients' data and services. Matt, a developer, has suggested the development of a customised information system for her business. She is also interested in the creation of an app with a simple and easy to use interface, which will allow her clients to choose flower arrangements of their choice. Andrea wants to make sure that her clients will have an enjoyable shopping experience and she asks Matt to ensure their data is protected from threats.

END OF INSERT