

SOFTWARE DEVELOPMENT

Units 3 & 4 – Written examination



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

SOLUTIONS

SECTION A- Multiple-choice questions (1 mark each)

Question 1

Answer: D

Explanation:

This data collection is not to create a new solution but to test the client satisfaction for the created solution. Therefore, she is collecting data for evaluating the effectiveness and/or efficiency of the solution.

Question 2

Answer: A

Explanation:

The developer can only perform 'range check' after the 'data type' validation technique has been applied.

Question 3

Answer: A

Explanation:

Options C and D are non-functional requirements. While option B is a constraint.

Question 4

Answer: C

Explanation:

If a section of code accepts parameters, manipulates them and returns a value it is a function. Iteration refers to a control structure that repeats a piece of code, not a subroutine. A method is a subroutine that is part of an object, but there is no mention of an object being used in the question.

Question 5

Answer: B

Explanation:

'Dimension' contains letters, numbers and symbols, therefore it is a string. 'RemoteControl' is Boolean as it only accepts True/False values, which have been formatted to Yes/No.

Question 6

Answer: C

Explanation:

On average, the battery for a drone will only last for around 10 minutes. Batteries for high-end drones can last 20 minutes or more. This is the main limitation for drones.

Question 7

Answer: C

Explanation:

Options A, B and D are aspects of the solution that need to be tested during development. Option C would be the one that can be assessed during evaluation.

Question 8

Answer: A

Explanation:

Ease of use is important as she requires a simple app. Response rate refers to the total amount of time it takes to respond. In this case it must be able to capture and display the number of steps and distance travelled.

Question 9

Answer: A

Explanation:

Indexing an array starts from 0 while the last index is the array length minus 1. The array index should start at zero because it relates to computer science concepts and it has a strong relation to language design.

Question 10

Answer: A

Explanation:

Constants have fixed values such as Pi, which cannot change. While variables can change their value.

Question 11

Answer: C

Explanation:

'n' is the number of array elements.

Passes - The number of array elements minus one

Swaps - The number of array elements minus one

Question 12

Answer: B

Explanation:

When the client wants to add extra features to the scope of the program while it is in the development stage. This delays the whole process as the design stage would have to be revisited.

Question 13

Answer: C

Explanation:

Constraints and scope are part of the analysis stage. While informal testing of the solution takes place during development.

Question 14

Answer: B

Explanation:

The symbols of a DFD are:

Rectangle – entity

Oval – system/process

Arrow – data flow

Question 15

Answer: B

Explanation:

Waterfall model has customer interaction during the analysis phase where data collected from the user to understand the need of the software solution. The spiral model the process for each task and evaluates risk after each iteration. While the agile model, iterated through the plan, design,

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build, and test and review cycle. At the end of each cycle, the customer reviews the solutions and gives feedback, which is then used as input for the next cycle thus creating an improved version of the software each time.

Question 16

Answer: A

Explanation:

The Privacy Act 1988 does not allow the use of a Tax file number as an identifier for private companies. Each business must have their own ID system.

Question 17

Answer: D

Explanation:

This is the definition of a milestone. An increase of time in the project will increase cost. A Gantt chart is used to show the timeline of a project. The critical path cannot have slack time.

Question 18

Answer: B

Explanation:

Option A refers to a data dictionary while C is a layout diagram. Option D is an attribute listing table.

Question 19

Answer: C

Explanation:

A Binary Search divides the list in half each time a comparison is made. It compares Uruguay to the following midpoints in the array: First Netherlands, then Portugal, Spain, Ukraine and finally Uruguay.

Question 20

Answer: D

Explanation:

A linear search will check each item in the list. There are 17 items and it will compare Uruguay to every single item from the start of the array. If it started from the other end of the list, it would find it in just one comparison, which was not one of the options presented.

SECTION B: Short-answer questions

Question 1 (8 marks)

a.

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

3 marks

b. **If** parcelWeight > 10 then

1 mark

c. **If** parcelWeight <= 10 then

Display (“parcel accepted”)

Else

Display (“parcel rejected”)

EndIf

1 mark

d. Selection

1 mark

e. The selection control structure allows one set of statements to be executed if a condition is true and another set of actions to be executed if a condition is false.

2 marks

Question 2 (2 marks)

The online world can bring the potential for security risks and scams, which could seriously damage data/information. Users/companies need to ensure that security measures are in place but there still might be a possibility of intrusion.

Question 3 (4 marks)

a. File B is an XML file. An XML file is an Extensible Markup Language (XML) file. It uses custom tags to describe the structure and other features.

2 marks

b. *Answers will vary.*

- XML lets you separate form (appearance) from content.
- Stores and transports data between different types of software.

2 marks

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Question 4 (4 marks)

- An introduction
- A description of the proposed software solution, which contains the constraints
- Functional Requirements and Non – Functional requirements of the solution.
- A description of the environment within which the solution will operate

1 x 4 marks

Question 5 (2 marks)

HTTP is the protocol over which data is sent between a browser and the website that the user is connected to. The 'S' at the end of HTTPS stands for 'Secure' which means that the communication between the browser and the website is encrypted. HTTP is used in public sites while HTTPS is used for transferring private data.

SECTION C: Case Study

Question 1 (4 marks)

Answers will vary.

- a. To expand her business. 1 mark
- b. To keep accurate details of her clients. 1 mark
- c. Requirement

Functional Requirement: to order floral arrangements online

Non-Functional Requirement: Ease of use

2 marks

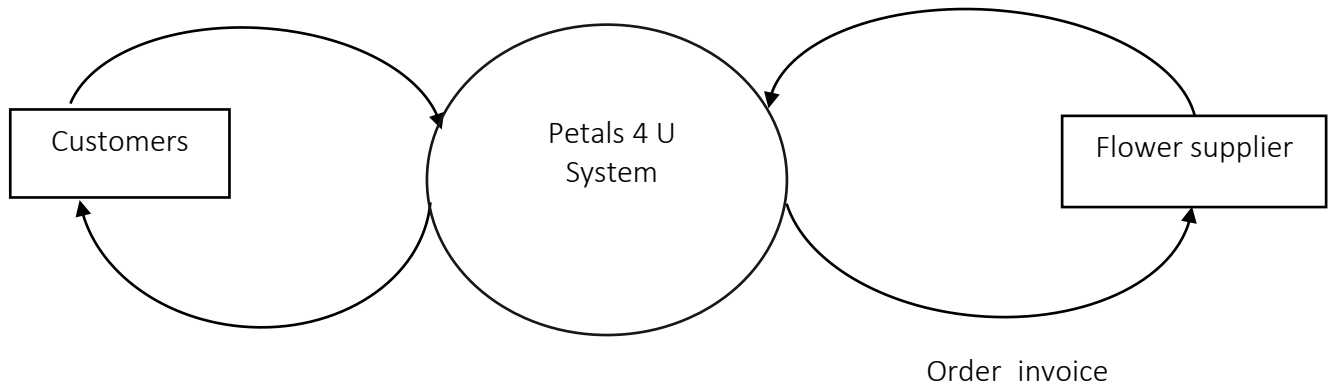
Question 2 (7 marks)

- a. This project will take 15 days to complete. The critical path indicates the duration of this project. A-B-C-G-H 2 marks
- b. It will delay the project by two days. 1 mark
- c. *Answers will vary.*
To schedule all the tasks.
To have a visual representation of the project and time frame.
To add milestones, dependencies and predecessors easily. 2 marks
- d. Annotations. Annotate the Gantt chart as the team progresses through the tasks. 2 marks

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Question 3 (7 marks)

- a. A context diagram is a type of DFD. It shows the interaction between the organisation's system and entities that provide and/or receive data. 2 marks
- b. *Answers will vary.*
The main system, the entities and two data flows. 5 marks

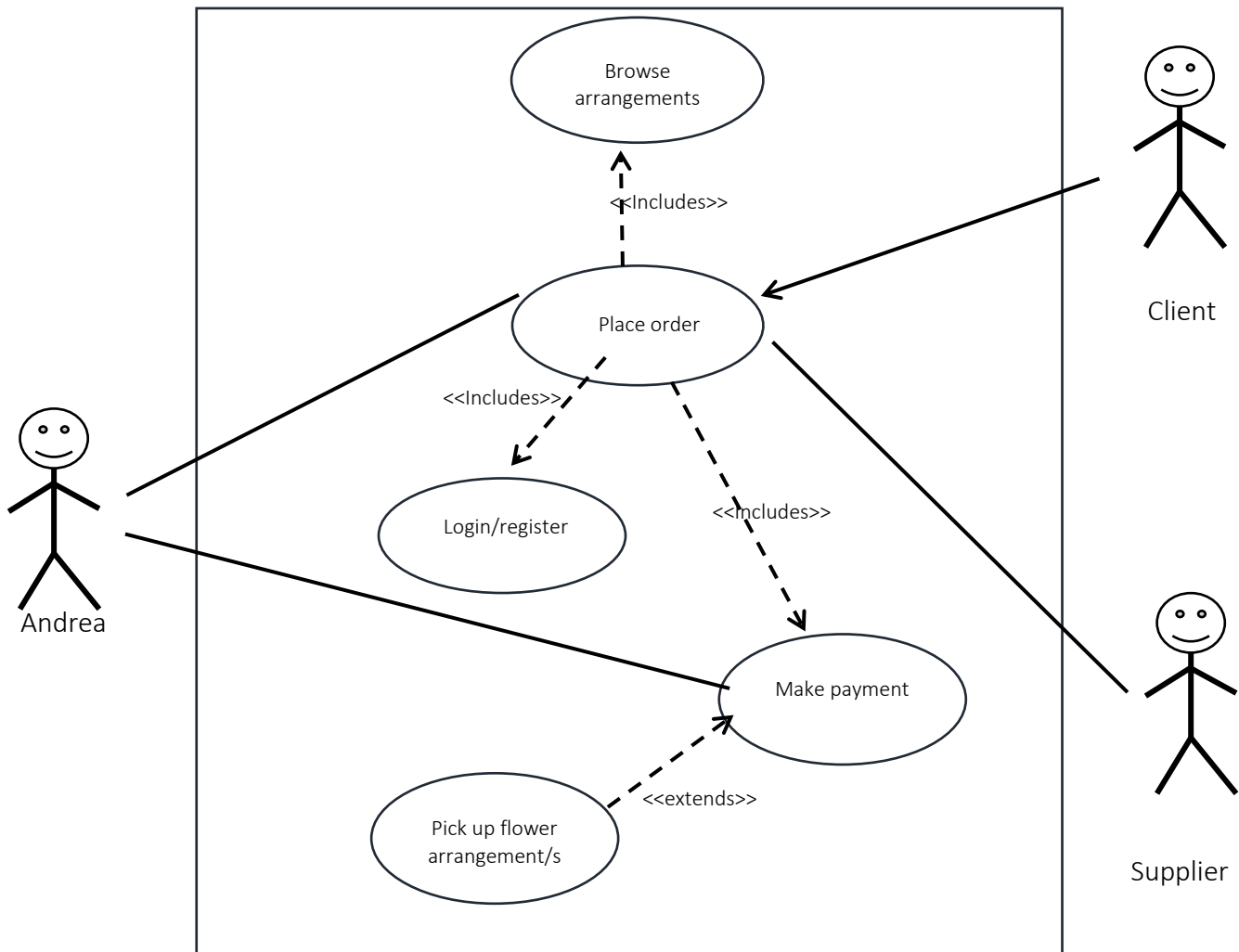


Question 4 (8 marks)

- a. The designs will vary.
Marks should be allocated according to the objects included. It must relate to the case study.
- Heading
 - Date
 - Type of floral arrangements
 - Annotations indicating the purpose of each object on the screen
- 4 marks
- b. Possible explanation for effectiveness in their mock-ups:
- Clear UI
 - The UI contain the necessary details
- 2 marks
- c. Efficiency:
- Clients can complete a booking quickly.
 - Client move from one screen to the other quickly.
 - Steps are easy to follow.
- 2 marks

Question 5 (7 marks)

Login/register	<<includes>>	Browse arrangements	Pick up flower arrangement/s	<<extends>>	Place order
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5 marks

a. Andrea is not an actor. It should be a role not a name.

1 mark

b. Fix it by changing the name from 'Andrea' to 'florist'/'owner'.

1 mark

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Question 6 (4 marks)

Answers will vary. Students must describe them.

Accidental: user error, lack of back up methods, loss of devices, opening infected emails, overwriting files, others.

2 marks

Deliberate: hackers, theft of equipment, identity theft, others.

2 marks

Question 7 (4 marks)

Answers will vary. Students must explain according to the case study. Two security techniques that Petals 4 U could use to protect their customers' rights.

A login system

Privacy polices

Question 8 (6 marks)

- a. Cloud computing refers to a type of Internet-based computing, where servers, storage and applications are delivered to an organization's networks devices. 2 marks
- b. Advantage: 24/7 access from any device anywhere 1 mark
Disadvantage: requires Internet connection, system may be down and therefore no access. 1 mark
- c. An incremental backup only includes the data that has been changed since the previous backup. While a full backup is a complete backup of all files selected. Full backups take place once a week, generally on Fridays while incremental backups are daily.

If there is a full back in place on Fridays and the system goes down in the middle of the week, she will lose valuable data from Monday to Wednesday. Therefore, both backups should be in place.

4 marks

Question 9 (4 marks)

- a. Acceptance testing involves the management of the company or the main client. In this case Andrea will have to ensure that everything is operating as expected. She can then provide feedback to the developers on any problems or faulty procedures she encounters.
- b. Formal testing involves the use of a test table to ensure that there are no errors in the solution. While user testing involves the users/client of the new system to check all the requirements of the solution are satisfied.

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Question 10 (7 marks)

Answers will vary. Sample answer:

- a. Collect data from the old and new system.
- b. Check the number of orders taken in the old system
- c. Check the number of orders taken in the new system
- d. Compare the number of orders from the previous system compare to the new one. This will give a clear indication if the new solution has improved her business performance.

4 marks

- b. A survey, included in the order form

A survey is a method of gathering data from a sample of people, in order to find out trends of data. It will generally contain closed questions for easy tabulation, but it can also contain open questions. It is easy to create and administer.

2 marks

- c. It should take place after 6 months.

1 mark