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, Google Docs, etc.) at any time.

FOR ADJUSTED STUDY DESIGN (2020 ONLY)
NOT FOR PRIVATE TUTOR USE.

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

SECTION A – Multiple-choice question

Question	Answer	Comments
1	*C*	A record holds data of different data types.
2	*C*	Error logs provide valuable data for evaluation.
3	*B*	This is a statement that can be evaluated.
4	*D*	Definition.
5	*A*	In a waterfall development model, you do not go back to a previous stage.
6	*B*	Definition.
7	*D*	The UCD is designed to show how users interact with the system.
8	*B*	SRS is part of the analysis stage. A is part of design. C and D part of development.
9	*A*	The internet is usually the pathway through which a VPN would operate, and the VPN allows access to an intranet. However, it is the VPN which creates the secure connection.
10	*A*	Iteration allows looping through code, in this case reading one line from the file at a time.
11	*C*	
12	*D*	The function is always finding the positive difference, which is what absolute value returns.
13	*C*	
14	*B*	Phishing is an email attack pretending to be from a legitimate source.
15	*C*	While he may have concern about any of these, the fact that he is checking sources implies Kenly is checking the author of the data.
16	*B*	Defined in the glossary.
17	*B*	One simple way of managing different file versions is to record the date in the filename.
18	*C*	
19	*B*	
20	*B*	

SECTION B – Short-answer questions

Question 1 (2 marks)

With reference to Object-oriented programming, compare the terms function and method.

A function is a sub-routine or block of related code which returns a value. A method is a sub-routine which belongs to a Class or object. It may or may not return a value.

1 mark is awarded for defining a function.
1 mark is awarded for defining the method as part of a class/object.

Question 2 (4 marks)

Describe two advantages to applying software updates that will help Amir explain to his father why applying software updates regularly to his computer is a good idea.

Software updates offer several advantages, including new features and security enhancements. New features enhance the user experience and provide more reasons to use the software. Security enhancements mean that errors or vulnerabilities identified as potentially harmful to users can be fixed providing a safer user experience.

1 mark is awarded for stating each advantage.
1 mark is awarded for a suitable description of that advantage.

Do not award two marks for stating more than two advantages. There are many other benefits such as bug fixes and efficiency improvements.

Question 3 (5 marks)

```
Begin
{Check Card Credits}
    Input cardNumber, purchaseAmount
    studCard ← new Student()
    If (studCard.load(cardNumber) <> FALSE) Then
        IF studCard.curCredits >= purchaseAmount THEN
            studCard.curCredits ← studCard.curCredits - purchaseAmount
            studCard.update()
        ELSE
            OUTPUT "Funds Low"
        ENDIF
    Else
        OUTPUT "Card not found"
    EndIf
End
```

1 mark awarded for all correct indentations.
1 mark awarded for selection statement.
1 mark awarded for correct assignment statement.
1 mark awarded for correct calling of update() method.
1 mark awarded for output of "funds low" message.

As there is an example of both the calling of a method and an OUTPUT statement, no other variations should be accepted.

Question 4 (9 marks)

a. Describe one purpose of version control.

Version control logs all changes to a file.

1 mark for the notion of change logging.

b. Discuss two possible consequences of Taj's decision to speak to his customers.

Consequences could be:

1. *Compensation to one or both companies involved, if they believe they have suffered loss as a result.*
2. *Loss of reputation. As a business involved in handling other business' data, reputation for high standards of data security is vital.*

1 mark for 1 implication and 1 mark for describing its impact (x 2).

As Taj's company turns over more than $3 million per year, his data security actions are governed by the Privacy Act 1988. He has breached the Act because he did not take reasonable steps to secure his customer's data. He should declare to all parties involved the nature of the breach and the steps he will take to remedy this situation. Because he chose to discuss the matter, it could reduce the implications. There are many other implications that students could discuss such as loss of customers and reputation, loss of business, investigation and firing of responsible staff, internal processes review, etc.

Alternatively, students may suggest that by being open with his clients, Taj is actually acting in good faith and could enhance the reputation of his company; thereby gaining more clients or more work from these clients.

c. Recommend two strategies Taj can employ to help reduce the chance of this error occurring again.

Strategy 1: Review staff training. If required, improve the training.
Strategy 2: Review process documentation. If required, improve documentation.

1 mark for 1 strategy involving at least 2 steps x 2.

Strategies infer at least 2 steps. Students have not been asked to justify they strategies, so do not award marks for descriptions unless it can be considered part of a further "step".

SECTION C – Case study

Question 1 (1 mark)

One organisational goal would be to make a profit from the sale of tomatoes.

One organisational goal would be to sell tomatoes in the market.

1 mark is awarded for 1 goal.

The goal should be related to the selling of tomatoes.

Question 2 (1 mark)

One system objective would be to regulate the temperature of the greenhouse.

One system objective would be to regulate the watering of the tomatoes.

1 mark is awarded for 1 objective.

The objective should be directly related to the automation of the greenhouse processes.

Question 3 (4 marks)

a. What data collection technique would this be considered? 1 mark

Reports.

The study design states techniques for collecting data to determine needs and requirements include interviews, observation, reports and surveys.

Markers can determine if they will accept "documentation" or similar.

b. Identify and justify another data collection technique. 3 marks

*They could go and **observe** another similar system in operation. This would allow them to see the advantages and disadvantages of the system and to avoid perhaps making the same mistakes the other users made.*

*They could **interview** one or more people who are using a similar system. This would help them understand what pitfalls to avoid and provide more detail about features they would want to implement.*

1 mark for identifying a technique – cannot be the same technique discussed in 3a.
2 marks for the justification – it should speak to the advantage of that method.

Question (4 marks)

a. Identify one functional requirement from the case study. 1 mark

FR: open the windows, turn on fan, control water system

1 mark for a valid functional requirement.

b. Identify one constraint from the case study and describe the impact the constraint would have on the project. 3 marks

Constraint: interact with MyWeatherStation, time (only on weekends).
Having to interact with the MyWeatherStation means they must use the specific data format and processes rather than those Tamara may already be familiar with. This might limit what information they can get or increase the time it takes due to having to learn that system.

As they can only work on the project on the weekends, it will take much longer to complete. It may also mean that a lot of time is lost remembering where they were up to each time they come back to project, further delaying the work.

1 mark for a valid constraint being provided, 2 marks for a detailed explanation of the constraint.

Question 5 (9 marks)

a. List four components of a project plan. 4 marks

Identification of tasks.
Timing of tasks.
Milestones.
Task dependencies.
Critical path.

1 mark for each of four components listed.

Students may describe the component or use synonyms.

b. What is the name given to a task that must wait until another task is complete before it can begin? 1 mark

Dependent task.

1 mark.

Note: Predecessor is NOT correct. A predecessor occurs before, a dependent task occurs after.

c. In project management what is a significant point in a project called? 1 mark

Milestone.

1 mark

d. What is slack time? 1 mark

Slack time is the amount of time a task can be delayed before it affects dependent tasks (or the whole project).

1 mark for definition.

e. Explain what critical path means. 2 marks

Critical path is the set of tasks that have no slack time. If any of these tasks are delayed it will delay the entire project.

2 marks for definition including two correct points.

Question 6 (7 marks)

a. What is the name given to the diagram above? 1 mark

Data Flow Diagram.

1 mark

b. From the diagram provide an appropriate label for the components marked A, B and C. 3 marks

A: Weather Information.
B: Updated Parameters.
C: Parameters.

1 mark for each correct response.

A: No other response accepted as it appears on the context diagram.
B: Control Parameters NOT accepted as then the process will not have done anything. Students could use "validation" or "processed" or similar.
C: Including the word "store" while not required is acceptable.

c. Identify the element type of the following components in the diagram. 3 marks

MyWeatherStation:	*External Entity*
Get Weather Details:	*Process*
C:	*Data Store*

1 mark for each correct answer.

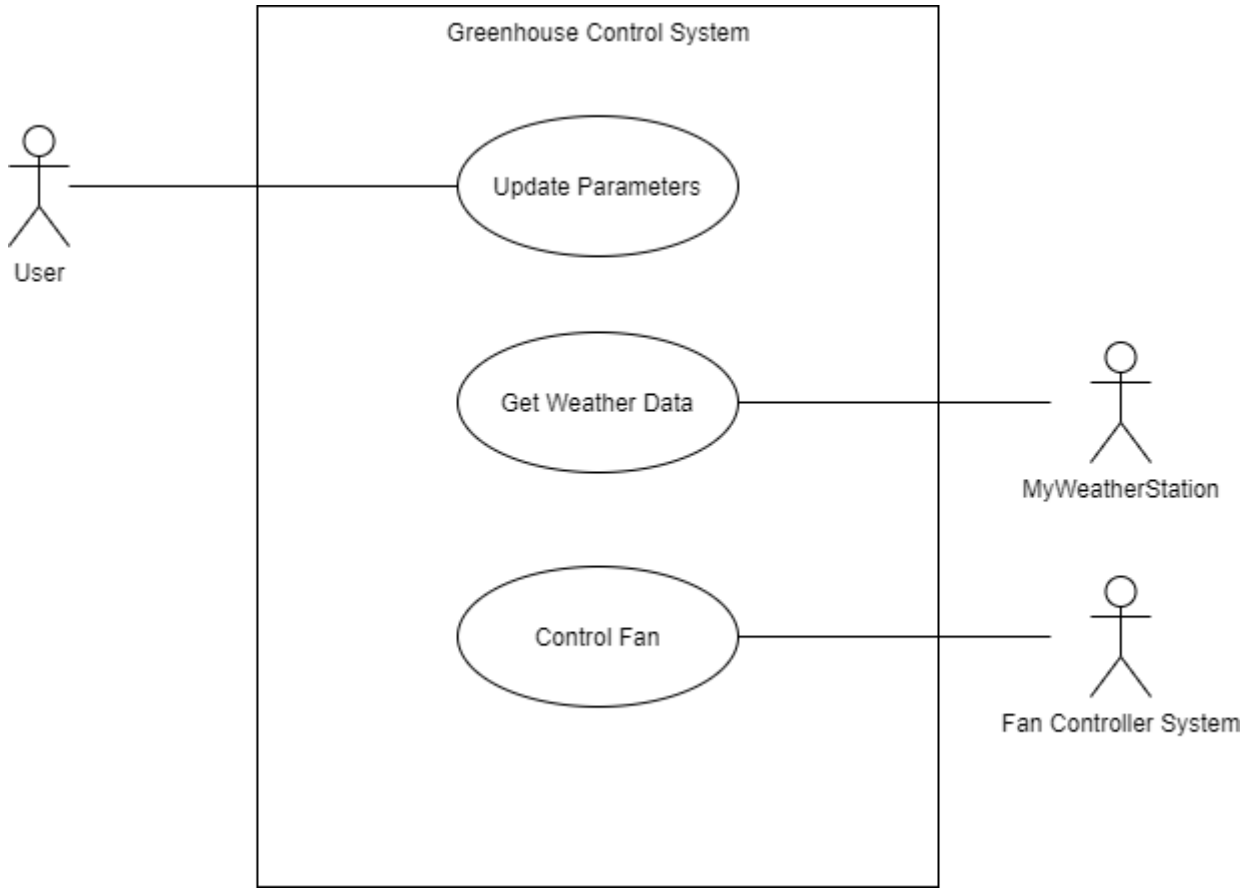
Question 7 (5 marks)

a. Justify the inclusion of the external controllers UCD. 2 marks

b. *As the controllers are receivers of data from the system and therefore they interact with the system, they should be considered Actors and therefore should be added and interact with Use Cases such as "Control Windows".*

2 marks for a valid justification, with at least 2 points.

c. On the diagram make the necessary changes to include the fan controller system. 3 marks



1 mark for adding an Actor "Fan Controller System".
1 mark for adding a suitably labelled Use Case.
1 mark for creating the association.

Question 8 (5 marks)

a. What is the name given to the "units" element which provides additional information for the value of each sensor? 1 mark

Attribute.

1 mark for the correct response.

b. Explain an advantage for both the manufacturer of the MyWeatherStation system and their customers in using XML to send the sensor data. 4 marks

For the manufacturer it means that many systems can interact with their product without the need for highly detailed documentation as the data itself describes what is contained within it. For customers, they can be confident that the data being sent is easy to read, in the right format and any new elements will be self-described.

2 marks for describing a valid advantage for the manufacturer.
2 marks for describing a valid advantage for the customer.

There are many valid advantages. For the manufacturer they are mostly around interoperability and for the customer it is about the self-description of the data itself.

Question 9 (6 marks)

a. Select a set of values for temperature to fully test the algorithm and complete the testing table below. 4 marks

temperature	Expected result	Actual result
19	*windows closed, fan off*	*windows closed, fan off*
20	windows open, fan off	windows open, fan off
23	windows open, fan off	windows open, fan off
24	windows open, fan on	windows open, fan off
25	windows open, fan on	windows open, fan on

1 mark for each correct ROW of responses.

Responses should follow the format of the example.

b. Identify the error in the pseudocode by writing the incorrect line below: 1 mark

```
If weatherData.temperature > 24 Then
```

c. Re-write the line of code correctly 1 mark

```
If weatherData.temperature >= 24 Then
```

Question 10 (6 marks)

a. Complete the following pseudocode by writing the line of code to update the dailySunshineHours variable: 2 marks

```
Begin
{update dailySunshineHours}
    Input weatherData.sunshine, dailySunshineHours

    dailySunshineHours <- ((dailySunshineHours * 60) +
                                    weatherData.sunshine ) / 60
End
```

2 marks for correctly calculating the additional hours from the returned minutes.
1 mark can be awarded for a partial correct response, so long as the correct intention is shown.

b. What data type should the dailySunshineHours variable be? 1 mark

Floating point.

1 mark for correct response.

c. Once the watering time has been calculated each morning, what needs to happen to the dailySunshineHours variable? 1 mark

The variable will need to be reset to zero.

1 mark for correct response.

d. Explain an advantage of storing the value of the dailySunshineHours variable to permanent storage each time it is updated. 2 marks

If the system were to stop for any reason, when it restarted, the current value can be retrieved thereby only missing a short amount of time, rather than potentially the whole day.

1 mark for an advantage of permanent storage over memory in RAM.
1 mark for explaining a consequence.

Question 11 (5 marks)

Tamara intends to code one part of the software solution, then implement it. She will then test to see if it works as intended, then move on to the next component. Identify which development model this process is most like and compare two advantages it has over alternative approaches.

Model: *Agile*
Advantage 1: *Agile focuses on delivering increments as opposed to spiral which focuses on minimising risk.*
Advantage 2: *Agile allows changes as new ideas occur to the developer as opposed to waterfall which locks all requirements at the analysis stage.*

1 mark for naming Agile model.
2 marks each for describing an advantage of that model and disadvantage of another model.

Compare indicates students should look at an alternative, not just the chosen model. Both advantages could reference the same alternative model.

Question 12 (4 marks)

Describe two factors they will need to consider when making their choice between Wi-Fi and Bluetooth?

Bluetooth has a limited range (up to 10m) whereas Wi-Fi could work up to 50m or more in open spaces.
Bluetooth typically can only connect to one (or sometimes a few) devices at once. If they wish to connect to many other systems, it might be a problem. Whereas using Wi-Fi there is no real limit (apart from bandwidth) on the number of devices.

Other answers might include speed (higher for Wi-Fi), security (better for Wi-Fi), power consumption (lower for Bluetooth).

2 marks for each correctly described factor (it should include a comparison of both technologies) x2.

Question 13 (3 marks)
List 3 things a privacy policy should state.

Explain how the organisation manages personal information.
The kinds of information you collect and hold.
How personal information is collected.
How personal information is stored.
The purposes for which you collect, hold, use and disclose personal information.
How an individual may access their personal information and seek correction of it.
How an individual may complain if you or a contractor breaches the APPs or a binding registered APP code.
Whether you are likely to disclose personal information to overseas recipients (including a related body corporate), and the likely countries that information may be sent.

1 mark for each correct response.