DLTV Resource Kit

For use with the VCE Applied Computing 2020–2024 Study Design

Applied Computing: Software Development
Units 3 and 4 Trial Examination 2 for 2020

Sample solution

Section A – Multiple Choice

Multiple Choice Answers

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

Section B – Short-answer questions

Solutions provided for this exam are example responses. In some cases, additional responses are given as alternative suggestions. A marking allocation guide has also been suggested for some questions.

Question 1 (4 marks)

Identify the organisational goal for Flunkies and two organisational objectives related this goal.

Organisational goal: To provide good, tasty and affordable food

2 marks for identifying goal (must be broad and high level)

Organisational objectives:

- *Improve efficiency in stock management (Measure: store stock levels 99%, waste < 0.3%)*
- *Reduce waste in payment of wages (Measure: On time 99%, Accuracy of calculations 99.9%)*

1 mark for each objective (must be specific and measurable)

Question 2 (6 marks)

a. **Discuss the merits of an incremental backup method versus online version control for data security and backup.** **4 marks**

   Merits of incremental backup—can be performed offline, complete backup in one place can be secured.

   Merits of online version control—control of ongoing editing by multiple users, relies on online connectivity at all times.

   1 mark for each merit or disadvantage of incremental backup (x two)

   1 mark for each merit or disadvantage of online version control (x two)

b. **Select your preferred method (Larry's or Ralph's) for securing and backing up Gretasoft's data and justify your choice.** **2 marks**

   Gretasoft already has multiple users worldwide, so continuous online connectivity is required anyway.

   2 marks for justification with reference to the scenario

Question 3 (5 marks)

Complete the chart adding appropriate milestones and dependencies. Label your milestones.

Mark allocation guide:

1 mark for placement of milestone at end of week 5 and/or 10

1 mark for dependency from task 7 to 9 and/or 8 to 10

1 mark for dependency from task 1 and 2 to 3 and/or 9 and 10 to 11

2 marks for other dependencies correct

Question 4 (6 marks)

Create a record or associative array that will address the needs of the program.

record/class/struct DuckObservation

  Date date

  String location

  String initials

  float/decimal hours

  integer noOfDucks

  integer/enumerated weather

  integer/enumerated predominantSpecies

  String notes

Mark allocation guide:

2 marks for items correct

2 marks for data types correct

1 mark for appropriate and consistent naming

1 mark for syntax of class, record, struct correct

Question 5 (9 marks)

a. **Write the pseudocode to achieve this outcome.** **7 marks**

```
BEGIN
  InputValue <- INPUT FROM USER
  Value = InputValue AS String

  Factor1 <- 0

  Factor2 <- 0

  FOR I <- 1 TO InputValue

    IF Value/I is a whole number

      Factor1 <- Value/I

      Factor2 <- Value/Factor1

      PRINT Factor1 + "X" + Factor2 + NEWLINE

    END IF

  END FOR

END
```

Mark allocation guide:

4 marks *for working solution*

2 marks *for use of arrows, not "=" (1 mark if partial)*

1 mark *for inclusion of "END" e.g. "END IF", "END FOR"*

b. **Create a data dictionary for the variables used in this application including their type.** **2 marks**

InputValue String

Value   Integer

Factor1   Integer

Factor2   Integer

2 marks *total*

END OF SECTION B

Section C – Case study

Solutions provided for this exam are example responses. In some cases, additional responses are given as alternative suggestions. A marking allocation has also been suggested for some questions.

Question 1 (6 marks)

a. Identify the organisational goals of **Cooperative Grocers' Association of Victoria.**   **2 marks**

Possible goals include:

- *providing better customer service*
- *competitive prices to customers*
- *lowering business costs.*

***2 marks** for stating one of the above*

b. Give *two* examples of organisational objectives that could be used to evaluate the success of the project.   **2 marks**

Example 1: Percentage of transactions on new equipment vs manual > 80%

Example 2: Reduction in staff wages > 50% with equipment installed

***1 mark** for each objective (must be specific and measurable)*

c. Provide *one* example of how the system would contribute to the efficiency of the businesses.
    2 marks

Possible examples include:

- *lower wages (cost)*
- *shorter customer wait times (time)*
- *easier management (effort).*

***2 marks** for stating one of the above*

Question 2 (4 marks)

Based on the case study, identify *two* functional requirements (FR) and *two* non-functional requirements (NFR).

FR examples:

- *The system shall be able to format and print a receipt.*
- *The system shall scan and lookup an item via its barcode.*

***1 mark** for each FR (x two)*

NFR examples:

- *The system shall have an internet connection.*
- *The system shall incorporate a touch screen.*

***1 mark** for each NFR (x two)*

Question 3 (6 marks)

a. **Outline what information is important when designing a naming convention.** **2 marks**

   Data type and purpose

b. **State *one* reason why it is important for the development team to all use the same naming convention.** **1 mark**

   The code must be readable to other developers.

c. **How would comments help the team?** **1 mark**

   Possible answers include:

   - *allows the other developers to know the purpose of the code in plain English.*
   - *allows the developer to understand the code if he/she comes back to it in the future.*

d. **State *two* characteristics needed to make comments useful.** **2 marks**

   Possible characteristics include:

   - *plain English—not too much jargon/cross reference*
   - *concise—not too long*
   - *balanced—not too many and not too few.*

Question 4 (13 marks)

a. **Describe a security risk that is posed by this design and explain how it could be mitigated.**
   3 marks

   Mark allocation guide:

   1 mark *for description (data could be intercepted in transit)*

   2 marks *for explanation (1 mark for mentioning TLS, SSL or https and 1 mark for explaining TLS, SSL or https)*

b. **Complete the XML output for the following transaction so it can be used as test data.**
   8 marks

```
<?xml version="1.0" encoding="utf-8"?>
<transaction dateime="20200701154600" storecode="1" receiptnumber="2120991">
  <items>
    <item name="American Mustard 250ml" barcode="9310012007104" price="2.50"/>
    <item name="Light Milk" barcode="9101998218291" price="2.56"/>
  </items>
  <creditcard>
    <number>5105105105105100</number>
    <expiry>0224</expiry>
  </creditcard>
  <bankcode>C01KMQ80901X77Z8</bankcode>
</transaction>
```

Mark allocation guide:

__1 mark__ for XML header (An attempt at least. <xml> or <?xml?> adequate)

__1 mark__ for use of attributes

__1 mark__ for correct attributes and complete list

__2 marks__ for closing tags

__2 marks__ for structure and content of hierarchy for transactions

__1 mark__ for hierarchy including plural header e.g. <items>

c. **Complete the following segment of the test table for sending data to the head office.** **2 marks**

Action	Expected Result	Actual Result	Pass/Fail
Send XML data to head office	*The XML is accepted and a confirmation OK sent back*	Head office system responds with "Error – bad format".	*Fail or 'F'*

Question 5 (3 marks)

State what aspect of the Australian Privacy Principles in the *Privacy Act, 1988* has been breached by head office and explain why this has occurred.

Possible principles include:

- *APP 2: Anonymity and pseudonymity*
- *APP 3: Collection of solicited personal information*
- *APP 5: Notification of the collection of personal information*
- *APP 6: Use or disclosure of personal information*
- *APP 7: Direct marketing*

__1 mark__ each for any three of the above.

a. **What could account for this difference in the number of users?** **2 marks**

Possible reasons include:

- *technology familiarity*
- *not wanting to interact in day-to-day activities*
- *younger people wanting to move more quickly.*

__1 mark__ each for any two of the above (or from the older perspective)

b. Propose *one* evaluation criterion that would measure the effectiveness of the new system.

2 marks

As the co-op wants to improve customer service, the criterion needs to measure effectiveness characteristics valued by customers, such as payment details being securely stored and transmitted, the system working reliably and the user interface being easily readable and usable.

Mark allocation guide:

1 mark for proposing a criterion that measures effectiveness

1 mark for proposing a criterion relevant to the aims of the co-op

Question 7 (10 marks)

a. **List the use cases for the design.**   **2 marks**
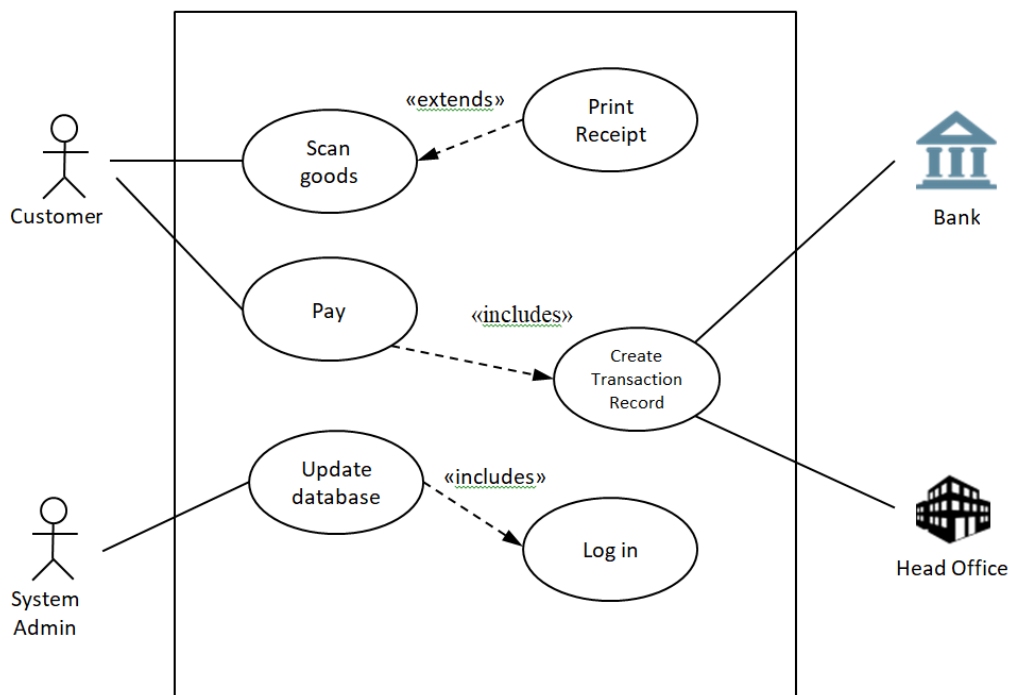
Scan goods

Print receipt

Pay

Update Database (admin)

Login (admin)

Create transaction record (bank requirement)

b. **Using your answer from *part a*. complete the use case diagram for the system in the space below.**   **6 marks**

2 marks for all use cases student listed in part a. are included

1 mark for Login use case + includes

1 mark for connection to all actors

1 mark for print receipt has "extends". (The positioning may vary.)

1 mark for Use case to create the transaction for the Head Office and receipt

c.   **Consider how a customer will use the system and the constraints of the design.**

   Identify what use case is not catered for and explain how it could be addressed without the need for extending the scope of the project.   **2 marks**

   Loose goods not able to be scanned.

   Prepackaged goods so they can be barcoded and fixed in price.

   Note: *It is mentioned in the case study that scales are not provided, so loose goods cannot be bought through this system. The mitigation is to provide only prepackaged goods, such as bags of apples.*

Question 8 (4 marks)

The following two designs (Design A and Design B) have been put forward for the screen layout.

a.   **Given the demographics of the areas selected for the trial, what design would be appropriate for implementation in Homelytown?**   **1 mark**

   Design B – suits older demographic

b.   **On the basis of effectiveness, propose *two* criteria that would justify your decision in *part a.***

                                                                                  3 marks

   Readability – larger text for older people

   Affordance – Prompt provide to say where to find the bank reader

   Others as justified

   1 mark for each criterion

   1 mark for justification using effectiveness criteria