Captivate
EDUCATION

Applied Computing: Software Development

Question and Answer Book

Practice examination – 2027

Student name _____

Teacher _____

- Reading time is 15 minutes
- Writing time is 2 hours

Approved materials

- one scientific calculator

Materials supplied

- Question and Answer Book
- Insert containing a case study for Section C
- Multiple-Choice Answer Sheet

Instructions

- Follow the instructions on your Multiple-Choice Answer Sheet.
- At the end of the examination, place your Multiple-Choice Answer Sheet inside the front cover of this book.

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

Contents

Section A (20 questions, 20 marks)

Section B (6 questions, 20 marks)

Section C (13 questions, 60 marks)

SAMPLE

Practice material in the layout of the 2025 VCAA paper – generated 2027. Not a VCAA examination.

Section A – Multiple-choice questions

Instructions

- Answer **all** questions in pencil on your Multiple-Choice Answer Sheet.
- 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

A weather application for Victorian fruit growers stores whether a frost warning is currently active for each orchard.

The most appropriate data type for storing this value is

A. string.
B. Boolean.
C. integer.
D. floating point.

Question 2

A veterinary clinic's booking module must store, for each patient: its name, its age in years and whether its vaccinations are up to date.

The most appropriate data structure is

A. a one-dimensional array.
B. a two-dimensional array.
C. a record.
D. a constant.

Question 3

A gym stores its class timetable as rows of comma-separated values in a CSV file rather than as an XML file.

A valid reason for this choice is that CSV files

A. suit simple tabular data and require less storage space.
B. can represent nested, hierarchical relationships between elements.
C. automatically validate the data type of each field.
D. encrypt their contents by default.

SAMPLE

Use the following information to answer Questions 4 and 5.

The function below calculates loyalty points for an online plant nursery. Customers earn one point per $10 spent, and members earn double points.

```
1   BEGIN calculate_points(order_total, is_member)
2       points ← 0
3       IF order_total <= 0 THEN
4           RETURN -1
5       ENDIF
6       points ← order_total DIV 10
7       IF is_member = TRUE THEN
8           points ← points × 2
9       ENDIF
10      RETURN points
11  END calculate_points
```

DIV performs integer division, discarding any remainder.

Question 4

The value returned by `calculate_points(85, TRUE)` is

A. 8
B. 17
C. −1
D. 16

Question 5

Lines 3 to 5 are an example of

A. existence checking.
B. type checking.
C. range checking.
D. syntax checking.

Question 6

A programmer names a variable `num_items_sold`.

The naming convention being used is

A. camel casing.
B. snake casing.
C. Hungarian notation.
D. Pascal casing.

SAMPLE

Question 7

A binary search is performed on the sorted array below to locate the value **38**.

Index	0	1	2	3	4	5	6
Value	3	9	14	21	30	38	45

The number of comparisons between 38 and an array element before the value is found is

A. 2
B. 3
C. 1
D. 7

Question 8

A developer notices that the classes `Car` and `Truck` share the attributes `registration`, `make` and `year`, and creates a new class `Vehicle` containing these common attributes for both classes to draw on.

The object-oriented principle being applied is

A. inheritance.
B. encapsulation.
C. abstraction.
D. generalisation.

Question 9

A software developer wants to understand how warehouse staff currently pick and pack orders before designing a replacement system. Staff are often unaware of the shortcuts and workarounds they use.

The most appropriate method for collecting this data is

A. a survey.
B. observation.
C. a report.
D. an interview.

Question 10

A school's new attendance app must comply with the *Privacy and Data Protection Act 2014* when storing student information. This is an example of which type of constraint?

A. Economic
B. Technical
C. Social
D. Legal

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Applied Computing: Software Development

Marking scheme – teacher copy

Practice examination – 2027

Not for distribution to students.

Section	Questions	Marks available	Marks awarded
Section A	20	20	
Section B	6	20	
Section C	13	60	
Total		**100**	

Section A

Question	Key	Question	Why
1	**B**	A weather application for Victorian fruit growers stores whether a frost warning is currently active for each orchard. The most appropriate data type for storing this value is	A frost warning is a true or false state, so Boolean is the appropriate data type. Common error: A (string) – storing "yes"/"no" text where a logical type is appropriate.
2	**C**	A veterinary clinic's booking module must store, for each patient: its name, its age in years and whether its vaccinations are up to date. The most appropriate data structure is	A record holds fields of varying data types (string, integer, Boolean) for one entity. Common error: B (2D array) – arrays require a single data type across all elements.
3	**A**	A gym stores its class timetable as rows of comma-separated values in a CSV file rather than as an XML file. A valid reason for this choice is that CSV files	CSV suits flat tabular data with minimal storage overhead. Common error: B describes XML's strength, not CSV's.

SAMPLE

<table>
<tr><td>4</td><td>D</td><td>The value returned by <code>calculate_points(85, TRUE)</code> is</td><td>85 DIV 10 gives 8 (integer division discards the remainder); the membership check doubles it to 16. Common errors: B (17) – rounding 8.5 instead of truncating; A (8) – missing the member doubling on line 8.</td></tr>
<tr><td>5</td><td>C</td><td>Lines 3 to 5 are an example of</td><td>The test rejects values outside the acceptable range (the value must be greater than zero): range checking. Common error: A (existence) – the value is present; it is its range that is tested.</td></tr>
<tr><td>6</td><td>B</td><td>A programmer names a variable <code>num_items_sold</code>.
The naming convention being used is</td><td>Lowercase words joined by underscores is snake casing. Common error: A (camel) – camel casing would be numItemsSold, with no underscores.</td></tr>
<tr><td>7</td><td>A</td><td>A binary search is performed on the sorted array below to locate the value 38.
<table><tr><td>Index</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>Value</td><td>3</td><td>9</td><td>14</td><td>21</td><td>30</td><td>38</td><td>45</td></tr></table>The number of comparisons between 38 and an array element before the value is found is</td><td>Compare 38 with the middle element (index 3, value 21) – continue in the upper half; compare with index 5 (value 38) – found. Two comparisons. Common errors: D (7) counts a linear search; B (3) counts the midpoint calculation as a comparison.</td></tr>
</table>

SAMPLE

8	**D**	A developer notices that the classes `Car` and `Truck` share the attributes `registration`, `make` and `year`, and creates a new class `Vehicle` containing these common attributes for both classes to draw on. The object-oriented principle being applied is	Creating a parent class from the common features of existing classes is generalisation. Common error: A (inheritance) – the reverse direction; inheritance is the subclasses drawing on the parent once it exists.
9	**B**	A software developer wants to understand how warehouse staff currently pick and pack orders before designing a replacement system. Staff are often unaware of the shortcuts and workarounds they use. The most appropriate method for collecting this data is	Observation captures actual behaviour, including shortcuts staff are unaware of and could not self-report. Common error: D (interview) – self-reporting misses workarounds the stem says staff don't know they use.
10	**D**	A school's new attendance app must comply with the *Privacy and Data Protection Act 2014* when storing student information. This is an example of which type of constraint?	A legislated obligation is a legal constraint. Common error: C (social) – confusing legislation that protects people with a social constraint; the binding force here is law.
11	**A**	The labels and input boxes on the *Green Thumb* order screen each start at different horizontal positions. The design principle that has **not** been followed is	Inconsistent left edges break alignment. Common error: C (balance) – balance concerns distribution of visual weight across the screen, not shared edges.
12	**C**	Users tap the magnifying-glass icon to search for plants, even though the screen contains no instruction to do so. The user experience characteristic that explains this is	An affordance is a visual property suggesting how an element is used, without instruction. Common error: D (usability) – the broader ease-of-use outcome; the icon-suggests-action mechanism is affordance.
13	**B**	Every reservation requires the member to log in, so the relationship between *Reserve study room* and *Log in* is drawn as	The «includes» stereotype points from the base use case to the always-performed use case, so the arrow runs from Reserve study room to Log in. Common error: D – correct stereotype, reversed direction.

SAMPLE