External assessment

Multiple choice question book

Digital Solutions

General instruction

- Work in this book will not be marked.

Queensland Government | QCAA Queensland Curriculum & Assessment Authority

Section 1

QUESTION 1

Asymmetric encryption algorithms

(A) all use one key.

(B) only use private keys.

(C) have a block size of 64.

(D) use different keys for encryption and decryption.

QUESTION 2

The useability principle of utility can best be described as the ability of

(A) different systems to present information in different ways to a single user.

(B) different systems to present information in the same way to a single user.

(C) a system to be used by many different users.

(D) a system to do the work a user needs to do.

QUESTION 3

This data dictionary is for a table containing data on basketball players in a professional league.

Table: players			
Column name	Data type	Primary key?	Length
playernumber	VARCHAR	Yes	2
playerheight	INTEGER		
playername	TEXT		
teamname	VARCHAR	Yes	10

The following SQL query returned an error on execution:

```
INSERT INTO players (teamname, playernumber, playername, playerheight)
VALUES ('Raptors', '2', 'Edward Lee', 183.5);
```

Which column needs to be adjusted for the query to work?

(A) playernumber

(B) playerheight

(C) playername

(D) teamname

QUESTION 4

Streaming requires real-time delivery of video and audio data. To ensure high-quality streaming for the viewer, the frames must arrive in the correct order and with minimal delay.

When developing such a system

(A) latency and jitter must be minimised.

(B) latency and jitter must be maximised.

(C) latency must be maximised and jitter must be minimised.

(D) latency must be minimised and jitter must be maximised.

QUESTION 5

A business uses an online form to collect information about its customers. A customer has entered their tax file number in a comment area, even though they were not required to provide this information. To comply with the Australian Privacy Principles (2014), the business should

(A) encrypt this data.

(B) delete this data immediately.

(C) notify the customer that the data has been received.

(D) notify the tax department that a data breach has occurred.

QUESTION 6

This algorithm determines the total points a player receives from rolling a standard six-sided dice three times.

```
BEGIN
  SET points = 0
  SET count = 0
  REPEAT
    SET result = random number between 1 and 6 inclusive (roll die)
    SET number on die as result
    IF result = 1 THEN
      points = points + 100
    ELSE
      IF result = 5
        points = points + 50
      ENDIF
    ENDIF
    INCREMENT count
  UNTIL count = 3
END
```

How many points will a player receive if they roll a 2, then a 3, followed by a 5?

(A) 50

(B) 100

(C) 150

(D) 200

QUESTION 7

An application accesses an API that obtains data relating to books read by users. The data that needs to be stored locally includes:

- one or more images of each book's cover
- book recommendation notes
- a comment on each book.

Book data is located using the ISBN — a unique identifier for each published book. When searching for a book, the returned JSON data is outputted:

```
{
  "volumeInfo":{
    "title": "Designing Relational Databases",
    "subtitle": "A beginner's guide",
    "authors": [
      "Joan Janson",
      "Katy Pratt"
    ],
    "isbn": "1440569239562",
    "publisher": "Books Ltd",
    "publishedDate": "2016-05",
    "pageCount":367,
    "imageLinks": {
      "smallThumbnail":
"http://books.abcd.com/books?id=jedfoYprny465&image=1&source=gbs _ api",
        "thumbnail":
"http://books.abcd.com/books?id=jedfoYprny465&image=3&source=gbs _ api",
        }
    }
}
```

What is the most appropriate method to store the data in local tables so it can be easily retrieved for display?

(A)

Table: book	
Field	Type
ISBN	Text
title	Text
pages	Integer
authors	Text
comments	Text
recommendation	Boolean

Table: images	
Field	Type
type	Text
image_link	Jpg
ISBN	Integer

(B)

Table: books	
Field	Type
ISBN	Text
title	Text
pages	Integer
comments	Text
recommendation	Text
image_link	Text

Table: authors	
Field	Type
ISBN	Text
name	Text

(C)

Table: book	
Field	Type
ISBN	Integer
title	Text
pages	Integer
comments	Text
recommendation	Boolean

Table: images	
Field	Type
ISBN	Integer
image_type	Text
image_link	Text

Table: authors	
Field	Type
ISBN	Integer
name	Text

(D)

Table: books	
Field	Type
ISBN	Integer
title	Text
pages	Text
comments	Text
recommendation	Text
publisher	Text
published_date	Text

Table: authors	
Field	Type
title	Text
name	Text

Table: images	
Field	Type
ISBN	Integer
image_link	Text

QUESTION 8

A soccer club needs to develop a system for storing members' data, including:

- name
- address
- team
- membership type
- email address
- phone number.

The secretary wants to email weekly newsletters to members. The treasurer wants to print membership lists and store yearly payment information.

To produce this system, the developer will need to generate a database, design interfaces and develop coded modules to send emails. After adding and updating member details, they will also need to

(A) generate reports and process payments.

(B) generate reports and provide secure logins for users.

(C) process payments and provide secure logins for users.

(D) generate reports, process payments and provide secure logins for users.

QUESTION 9

This table contains the posts published to a rock climbing group on a social networking site.

Table: posts			
Date	Author	Content	Likes
15/06/2019	Lui Chan	Would anyone like to rock climb tomorrow?	5
15/06/2019	Lui Chan	Who is going to the boulder festival?	15
14/06/2019	Lui Chan	Who wants to go to yoga tonight?	7
14/06/2019	Amy Smith	Has anyone picked up a chalk bag?	9

An SQL query is executed:

```
SELECT Date, Author, SUM(Likes)
FROM Posts
GROUP BY Date, Author
```

What is the output of this query?

(A)

Date	Author	Content	SUM(Likes)
15/06/2019	Lui Chan	Would anyone like to rock climb tomorrow?	20
14/06/2019	Lui Chan	Who wants to go to yoga tonight?	7
14/06/2019	Amy Smith	Has anyone picked up a chalk bag?	9

(B)

Date	Author	SUM(Likes)
15/06/2019	Lui Chan	27
14/06/2019	Amy Smith	9

(C)

Date	Author	SUM(Likes)
14/06/2019 15/06/2019	Lui Chan	27
14/06/2019	Amy Smith	9

(D)

Date	Author	SUM(Likes)
15/06/2019	Lui Chan	20
14/06/2019	Lui Chan	7
14/06/2019	Amy Smith	9

QUESTION 10

In a game, scores are averaged for players in the same team. Each team consists of five players. Player names and scores are to be stored in arrays.

The referee was given the first version of the algorithm, which they then improved to create the second version.

First version

```
ProcessGroup (name[], score[])
BEGIN
  SET total = 0
  PRINT name[1]
  CALCULATE total = total + score[1]
  PRINT name[2]
  CALCULATE total = total + score[2]
  PRINT name[3]
  CALCULATE total = total + score[3]
  PRINT name[4]
  CALCULATE total = total + score[4]
  PRINT name[5]
  CALCULATE total = total + score[5]
  CALCULATE average = total / 5
  PRINT average
END
```

Second version

```
ProcessGroup (name[], score[])
BEGIN
  SET groupSize = 5
  SET count = 0
  SET total = 0
  WHILE count < groupSize
    PRINT name[count]
    CALCULATE total = total + score[count]
    INCREMENT count
  ENDWHILE
  CALCULATE average = total / groupSize
  PRINT average
END
```

Which features of good algorithms have been improved in the second version?

(A) efficiency, effectiveness

(B) reliability, effectiveness

(C) maintainability, efficiency

(D) reliability, maintainability

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