

STUDENT NUMBER           Letter

# INFORMATION TECHNOLOGY: IT APPLICATIONS

## Written examination

Thursday 12 November 2015

Reading time: 11.45 am to 12.00 noon (15 minutes)

Writing time: 12.00 noon to 2.00 pm (2 hours)

### QUESTION AND ANSWER BOOK

#### Structure of book

<i>Section</i>	<i>Number of questions</i>	<i>Number of questions to be answered</i>	<i>Number of marks</i>
A	20	20	20
B	11	11	70
			Total 90

- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers.
- Students are NOT permitted to bring into the examination room: blank sheets of paper and/or correction fluid/tape.
- No calculator is allowed in this examination.

#### Materials supplied

- Question and answer book of 18 pages.
- Answer sheet for multiple-choice questions.

#### Instructions

- Write your **student number** in the space provided above on this page.
- Check that your **name** and **student number** as printed on your answer sheet for multiple-choice questions are correct, **and** sign your name in the space provided to verify this.
- All written responses must be in English.

#### At the end of the examination

- Place the answer sheet for multiple-choice questions inside the front cover of this book.

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

**SECTION A – Multiple-choice questions****Instructions for Section A**

Answer **all** questions in pencil on the answer sheet provided for multiple-choice questions.

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 local community uses a proxy server because proxy servers

- A. provide access to online resources.
- B. are cost-free and manage connections to the internet.
- C. enforce online social protocols and provide a unique internet address.
- D. manage connections to the internet and provide a unique internet address.

**Question 2**

The main purpose of a website that publishes the findings of space research is

- A. collaboration.
- B. project monitoring.
- C. knowledge sharing.
- D. promotion of a collective identity.

**Question 3**

A carpet company is introducing a new information system to manage quotes, sales and carpet stocks at its 15 stores. All store managers need to learn how to use the forms for data collection, the functions available for data manipulation and the reporting formats. They will then be able to provide detailed instructions to sales staff before the new system is introduced.

The best online training for these store managers would be

- A. a tutorial.
- B. a technical manual.
- C. content-sensitive help.
- D. to email the Help Desk.

**Question 4**

Which of the following are non-technical constraints on a solution?

- A. the privacy of users who upload images and the file size of the images
- B. copyright entitlements of the artists who created the images used on a website and the file format of those images
- C. the privacy of people shown in the images used on a website and the limited bandwidth available to users who want to view them
- D. copyright entitlements of the artists who created the images used on a website and the human rights of people shown in those images

**Question 5**

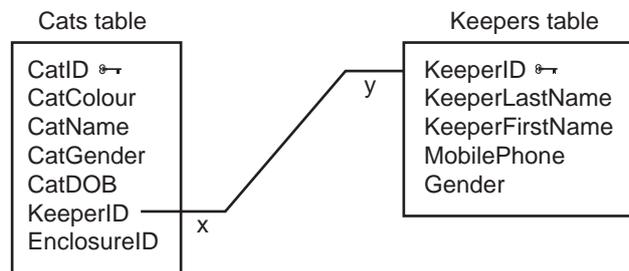
Sammy Real Estate has offices in 10 suburbs and 15 country towns. Its staff need to send videos of properties and customers' financial details between offices.

The most secure technology for protecting the company's network would be

- A. wireless and file encryption.
- B. fibre optic cable and file encryption.
- C. wireless and a website with a closed section.
- D. coaxial cable and a website with a closed section.

*Use the following information to answer Questions 6–8.*

A zoo keeps a relational database management system (RDBMS) to store data about its animals, the enclosures they are kept in and the staff who act as keepers. The field names for the Cats and the Keepers tables are shown below.

**Question 6**

In the Cats table

- A. CatID, KeeperID and EnclosureID are always unique.
- B. neither KeeperID nor CatID nor EnclosureID is always unique.
- C. KeeperID is always unique, and CatID and EnclosureID are not always unique.
- D. CatID is always unique, and KeeperID and EnclosureID are not always unique.

**Question 7**

Each cat has a keeper responsible for it. Each keeper is responsible for up to four cats.

The relationship x-to-y shown above is

- A. one-to-one.
- B. one-to-many.
- C. many-to-one.
- D. many-to-many.

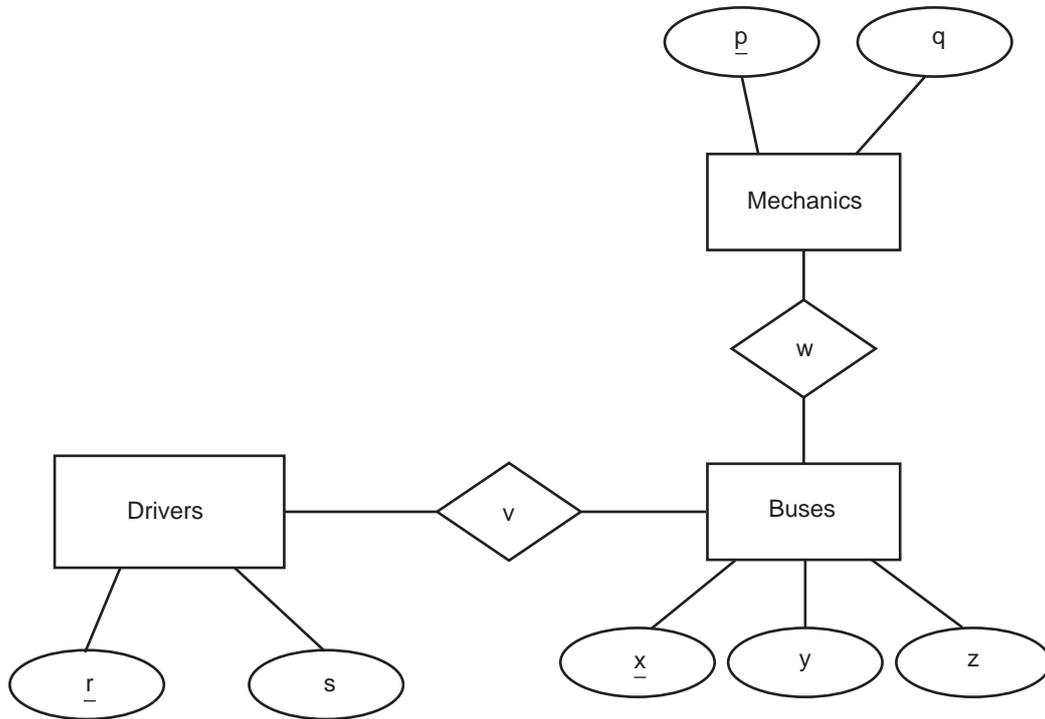
**Question 8**

EnclosureID in the Cats table can be used to retrieve data effectively because

- A. there is only one cat in each enclosure.
- B. many keepers can be responsible for one cat.
- C. many keepers can be responsible for one enclosure.
- D. each enclosure has a unique identity in an Enclosures table.

Use the following information to answer Questions 9 and 10.

The entity-relationship (ER) diagram below is used by a bus company to represent the Buses, Drivers and Mechanics data stored in its RDBMS.



**Question 9**

Primary keys could be represented by the labels

- A. p v w
- B. q s y
- C. p r x
- D. q r y

**Question 10**

The labels w and v represent, in that order

- A. Repair and Drive.
- B. Drive and Travel.
- C. Drive and Repair.
- D. Travel and Drive.

**Question 11**

Bank customers can have a car loan if they have at least \$5000 in savings or if they are employed and not paying rent.

If S is savings, E is employment and R is rent, the design for a query to check if a customer can have a loan is

- A.  $S \geq 5000$  and (E or R)
- B.  $S > 5000$  and E or not R
- C.  $S \geq 5000$  or (E and R)
- D.  $S \geq 5000$  or (E and not R)

**Question 12**

The most effective way to store records that are no longer actively used but must be retained is to

- A. save off-site only those records that have changed since the last backup.
- B. restore inactive records that have been saved off-site as part of a disaster recovery strategy.
- C. remove records that have not been accessed for a period of time and save them away from the active RDBMS.
- D. save all active and inactive records on different hard disks and store each of these at a different off-site location.

**Question 13**

An online survey has been designed for the members of a music society to rank their favourite music genres from 1 to 4.

Which one of the following is the most effective validation technique for the survey?

**A.**

	1-4
pop	<input type="checkbox"/>
jazz	<input type="checkbox"/>
rock	<input type="checkbox"/>
classical	<input type="checkbox"/>

**B.**

	1	2	3	4
pop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
jazz	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
rock	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
classical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Key**

radio buttons

check boxes

text boxes

**C.**

	1-4
pop	<input type="text"/>
jazz	<input type="text"/>
rock	<input type="text"/>
classical	<input type="text"/>

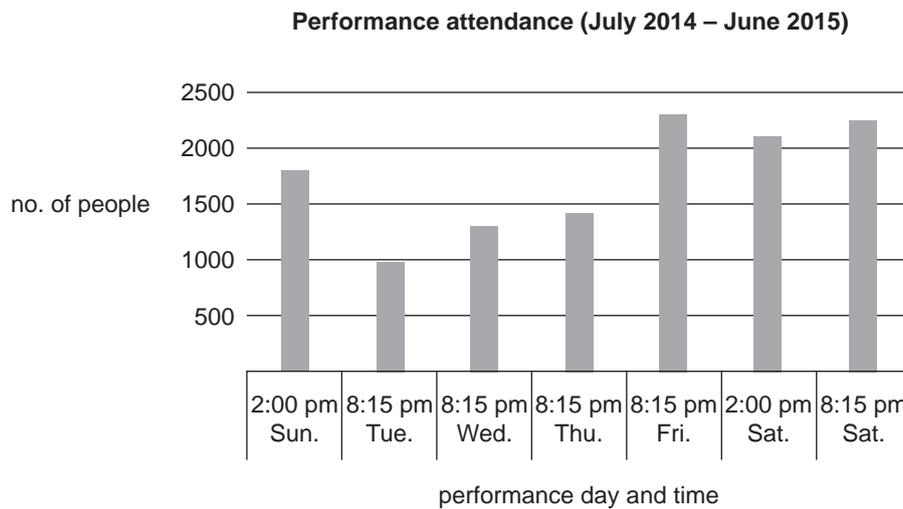
**D.**

	1	2	3	4
pop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
jazz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
rock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
classical	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Use the following information to answer Questions 14–16.

The Belfield Theatre Company (BTC) is a successful suburban amateur theatre group. In recent times, however, its audience numbers have dropped, resulting in declining income. If this continues, the quality of the plays put on by the BTC will be affected. Therefore, the BTC has set a three-year goal of maintaining its production quality, while at the same time reducing costs. The BTC uses an information system to record all its ticket sales.

The BTC's management committee is planning the performance schedule for 2016 and beyond. The committee's secretary produced the following chart showing the total number of people who attended each performance time during July 2014 – June 2015.



#### Question 14

The chart above would best assist the committee to make

- A. an operational decision about which performance times should not be scheduled for 2016.
- B. a strategic decision about changing the performance days for the next three years.
- C. a tactical decision about which performance days should be scheduled for 2016.
- D. a tactical decision about what is the best time of day to put on a performance.

#### Question 15

At what stage of the problem-solving methodology would the specific data requirements for recording attendances be identified?

- A. design
- B. analysis
- C. evaluation
- D. development

**Question 16**

The BTC is considering preparing a weekly report of performance attendances in a table.

Which one of the following designs uses the most appropriate conventions for a table?

**A.**

<i>The Crucible (Week 1)</i>	
<b>Time</b>	<b>Attendance</b>
Sun. – 02:00 pm	118
Tue. – 08:15 pm	77
Wed. – 08:15 pm	89
Thu. – 08:15 pm	92
Fri. – 08:15 pm	146
Sat. – 02:00 pm	140
Sat. – 08:15 pm	149

**B.**

<i>The Crucible (Week 1)</i>	
<b>Time</b>	<b>Attendance</b>
Sun. – 02:00 pm	118
Tue. – 08:15 pm	77
Wed. – 08:15 pm	89
Thu. – 08:15 pm	92
Fri. – 08:15 pm	146
Sat. – 02:00 pm	140
Sat. – 08:15 pm	149

**C.**

<i>The Crucible (Week 1)</i>	
<b>Time</b>	<b>Attendance</b>
Sun. – 02:00 pm	118
Tue. – 08:15 pm	77
Wed. – 08:15 pm	89
Thu. – 08:15 pm	92
Fri. – 08:15 pm	146
Sat. – 02:00 pm	140
Sat. – 08:15 pm	149

**D.**

<i>The Crucible (Week 1)</i>	
<b>Time</b>	<b>Attendance</b>
Sun. – 02:00 pm	118
Tue. – 08:15 pm	77
Wed. – 08:15 pm	89
Thu. – 08:15 pm	92
Fri. – 08:15 pm	146
Sat. – 02:00 pm	140
Sat. – 08:15 pm	149

**Question 17**

Which set of design tools best represents relationships in a website?

- A. site maps and mock-ups
- B. storyboards and site maps
- C. ER diagrams and structure charts
- D. structure diagrams and hierarchy charts

**Question 18**

Company A has a website to promote and sell its products. Its network includes file servers, printers and workstations.

Company B created the website.

Company C provided the printers and network hardware.

Company D provides the technical staff who maintain the network hardware.

Which company has the responsibility of ensuring customer data is confidential?

- A. Company A
- B. Company B
- C. Company C
- D. Company D

**Question 19**

The best device to prevent external electronic threats from entering a network would be

- A. a firewall.
- B. encryption software.
- C. a virtual private network.
- D. a username and password.

**Question 20**

A cricket club has introduced a strategy to manage the disposal of players' data.

A suitable criterion for evaluating the effectiveness of the strategy would be to ask

- A. is the hard disk of the club's information system completely blank?
- B. can the club's information system be accessed by an unauthorised user?
- C. can a player's record be retrieved from the club's information system by an authorised user after that record has been deleted and the hard disk reformatted?
- D. can a player's record be retrieved from the club's information system by an authorised user after that record has been deleted by being overwritten with new data?

**SECTION B****Instructions for Section B**

Answer **all** questions in the spaces provided.

**Question 1** (1 mark)

State **one** reason for a sports club to have a closed section on its website.

**Question 2** (6 marks)

An employment agency performs a weekly full backup of client records to an on-site tape media and a nightly incremental backup to the cloud.

Complete the following table by describing each storage strategy and explaining the reason for each storage strategy.

<b>Storage strategy</b>	<b>Description of storage strategy</b>	<b>Explanation of reason for storage strategy</b>
weekly full backup		
nightly incremental backup		

**Question 3** (5 marks)

ViteHealth is a small shop that sells vitamin products. Its current website lists products and prices, and provides a postal address and phone number for customers to place orders. A new manager has suggested that ViteHealth update its website to include a customer login and offer online shopping.

- a. Describe **one** advantage to ViteHealth of offering online shopping. 1 mark

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- b. Recommend two techniques that ViteHealth should use on the updated website to protect the rights of customers supplying data online. Justify each recommendation. 4 marks

Technique 1 \_\_\_\_\_

Justification \_\_\_\_\_

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Technique 2 \_\_\_\_\_

Justification \_\_\_\_\_

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**Question 4** (4 marks)

Michael is designing a prototype website. He can use one of two image files for the front page. File A is 2 MB and in BMP format. File B is 60 KB and in JPG format.

- a. Which image should Michael use? Justify your choice. 2 marks

Image \_\_\_\_\_

Justification \_\_\_\_\_

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- b. Explain how Michael could test that he has made the correct choice of image. 2 marks

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**Question 5** (11 marks)

A web designer is given a brief by Choices@T-shirts to design a website that will allow international customers the opportunity to purchase from the existing range of T-shirts. In addition, customers will have the option of designing their own T-shirts. Once an order is placed, customers will be able to log in and track their orders. The website must also provide space for Choices@T-shirts' contract designers, who work remotely, to collaborate on the design of new T-shirts.

- a. In the space provided, design the home page of the website to meet the needs of Choices@T-shirts. Your design must include an example of each of the following:
- **one** layout convention
  - **one** link convention
  - **one** navigation design element

These three examples **must** be clearly labelled on your design.

9 marks



- b. Explain how your chosen layout convention in **part a.** meets the needs of Choices@T-shirts. 2 marks

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**Question 6** (4 marks)

A small bookshop wants to start selling books online.

A sample of data from previous sales of books is shown below.

<b>BookTitle</b>	<b>Author</b>	<b>UnitPrice</b>	<b>OrderQuantity</b>	<b>Total</b>	<b>BuyerName</b>	<b>ContactEmail</b>
Arctic Birds	Schnell, AB	9.50	4	38.00	Sam Green	Gsam@xmail.com
Oil Maps	Nguyen, MB	4.00	2	8.00	Jill Ozman	Ozmanjillw@uni.edu
Piano34	Nguyen, JC	5.20	3	15.60	Harry Bell	HarryB@books.net

Group this data into four tables (Tables 1–4). Add appropriate table names and fields so that the data collected from online sales conforms to third normal form (3NF) of a relational database management system (RDBMS).

Table 1

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Table 2

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Table 3

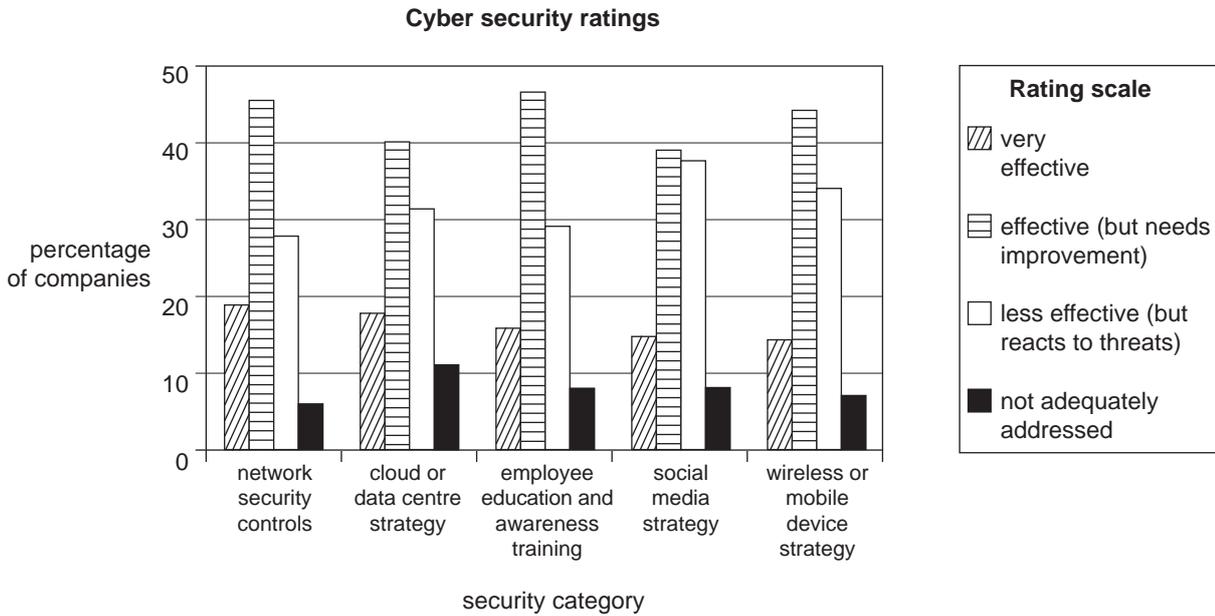
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Table 4

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**Question 7** (4 marks)

The graph below is derived from data reported in a survey about cyber security. The survey asked a number of companies to rate the effectiveness of five categories of security measures.



Data: Telstra Cyber Security Report 2014, p. 12

a. Which security category is considered ‘very effective’ by the greatest percentage of companies? 1 mark

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b. Identify a software security measure used to protect files in a network. 1 mark

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c. Describe a procedure for effectively securing data communicated in a network. 2 marks

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**Question 8** (8 marks)

HipDezigns is an online clothing company targeted at the 20–30-year-old market. Two friends, Kim and Gerry, regularly access the company’s website to check the latest fashions.

HipDezigns keeps the viewing history of each user of its website and stores this data to monitor users’ interest in particular products. When a user clicks on a product for the third time, an automatic message is posted next to the product, claiming that there is only one item left.

Both Kim and Gerry were interested in the same product. When they individually went online at the same time to make their purchase, only Gerry received the automatic message. Kim, who had visited the website once, did not.

- a. Explain the ethical dilemma that arises from the data storage and monitoring practice used by HipDezigns. 2 marks

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- b. Outline the positive and negative effects of HipDezigns’ practice on **either** Kim **or** Gerry. Indicate with a tick (✓) if your answer relates to Kim or Gerry. 4 marks

Kim                       Gerry

Positive \_\_\_\_\_

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Negative \_\_\_\_\_

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- c. Propose a strategy for resolving the ethical dilemma explained in **part a**. 2 marks

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**Question 9** (6 marks)

The following data table is used to record the details of the 4 L tins of paint kept by a decoration and renovation shop. Tins are identified by colour, cost, product code and the quantity currently in the shop.

**Paint table**

Field1	Field2	Field3	Field4
orange	51.50	Or003	8
white	37.75	Wh006	22

- a. Recommend a data type for Field3. Justify your choice. 2 marks

Data type \_\_\_\_\_

Justification \_\_\_\_\_

\_\_\_\_\_

- b. Recommend effective names for each of the fields. 2 marks

Field1 \_\_\_\_\_ Field2 \_\_\_\_\_

Field3 \_\_\_\_\_ Field4 \_\_\_\_\_

- c. Explain the importance of using naming conventions in an RDBMS. Give an example to support your answer. 2 marks

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**b.** Describe how you would identify the most frequently called number in one month once the design has been developed.

Indicate with a tick (✓) if your answer relates to an RDBMS or a spreadsheet.

2 marks

RDBMS                       spreadsheet

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**c.** Explain how you would use your solution in **part a.** to calculate and display the total cost of outgoing calls if they are charged at \$0.08 per minute.

Indicate with a tick (✓) if your answer relates to an RDBMS or a spreadsheet.

3 marks

RDBMS                       spreadsheet

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**d.** Recommend a strategy to evaluate the effectiveness of your solution in **part a.**

2 marks

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**Question 11** (8 marks)

HiSkies is a parachuting club that needs an online application form for users who want to join the club and learn to skydive.

The online form will collect the following data:

- first name and family name
- date of birth
- mobile phone number and email address
- a description of previous skydiving experience (maximum of 100 words)
- acceptance of club rules

a. What is the best data type for the field that collects data on the acceptance of club rules? Explain why. 2 marks

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b. Describe an electronic validation technique that could be used to ensure that a mobile phone number has the correct number of digits. Justify your answer. 3 marks

Electronic validation technique \_\_\_\_\_

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Justification \_\_\_\_\_

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c. Recommend a testing technique that could be used to ensure that the form collects the data required. 3 marks

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