Cambridge Assessment International Education

Cambridge International AS & A Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

INFORMATION TECHNOLOGY **9626/13**

Paper 1 Theory **October/November 2023**

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use an HB pencil for any diagrams, graphs or rough working.
- Calculators must **not** be used in this paper.

INFORMATION

- The total mark for this paper is 70.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **12** pages.

DC (RW/JG) 318593/3

1 Using a numerical example, explain the differences between data and information.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

2 Irene has produced a document using a word processing package. She has saved it as a text file and also as a separate word processed file.

Give **four** advantages of saving the document as a text file compared with saving the document as a word processed file.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

3 Mainframe computers and supercomputers are specialised types of computer with some similar characteristics.

Explain what is meant by each of the following characteristics.

(a) fault tolerance

.....

.....

.....

.....

.....

.....

.....

..... [3]

(b) heat maintenance

.....

.....

.....

.....

.....

..... [2]

Mainframe computers were developed from the need for computers to process data in tasks such as carrying out a census.

(c) Explain why mainframe computers are used to process the data from a census.

.....

.....

.....

.....

.....

.....

.....

..... [3]

4 A bank stores a database of all its customers. The first field in the database is the account number. The account numbers are different for each customer and consist of 10 digits, for example 7382690643.

New accounts are opened in branches of the bank on a regular daily basis.

(a) Describe **three** errors that a person entering the account numbers of new customers might make. For each one describe an appropriate validation check that would trap the error. A range check or limit check would **not** be suitable. Each validation check must be different.

Error 1 .....

.....

Validation check 1 .....

.....

.....

Error 2 .....

.....

Validation check 2 .....

.....

.....

Error 3 .....

.....

Validation check 3 .....

.....

.....

[6]

When customers open new accounts, the details are gathered together in a transaction file. At the end of the day a branch transmits the transaction file to head office, using the internet.

(b) The transmission of the transaction file is verified using a hash total.

Describe this process, explaining why a hash total is used rather than a control total.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

5 It is essential to calibrate sensors used in any monitoring technology.

Describe what is meant by:

(a) two point calibration .....

.....

.....

.....

.....

..... [2]

(b) multipoint calibration. .....

.....

.....

.....

.....

..... [2]

6 When searching a database it is possible to use different types of query.

Describe the differences between simple and complex queries.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

7 Sound editing software has a number of features.

Describe what is meant by:

(a) fade in and fade out

.....

.....

.....

.....

.....

..... [2]

(b) lossless compression

.....

.....

.....

.....

.....

..... [2]

(c) lossy compression.

.....

.....

.....

.....

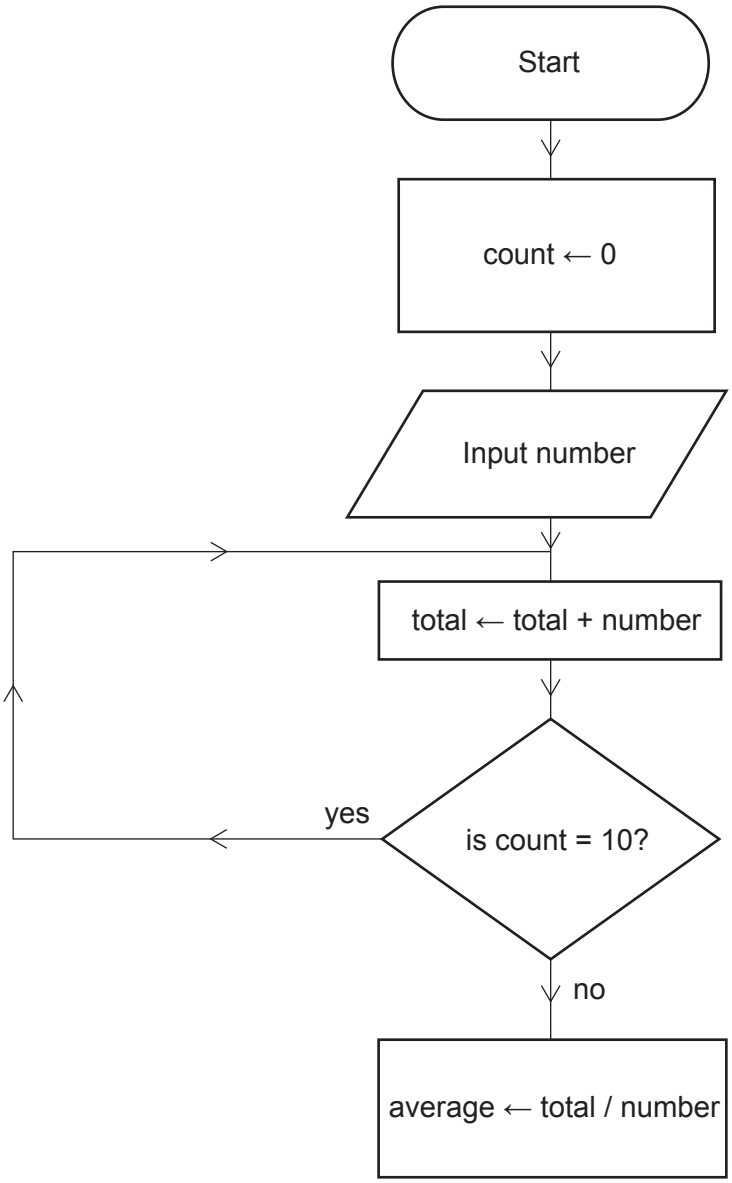
.....

..... [2]

8 The average (mean) of a set of 10 numbers is calculated by:

- adding the numbers together to get a total
- dividing the total by 10.

Juan has attempted to draw a flowchart of an algorithm which finds the average of 10 numbers. He has made some mistakes and omitted to include some boxes.



Suggest **six** improvements he should make to his flowchart.

1 .....

.....

2 .....

.....

3 .....

.....

4 .....

.....

5 .....

.....

6 .....

..... [6]

9 A programmer is writing an algorithm in pseudocode to determine whether a number is a factor of another number.

Y is a factor of X if the result of X/Y is a whole number.

In pseudocode `INT(W)` returns the whole number part of W.
If W is the same as `INT(W)` that means W is a whole number.

Complete the algorithm, including the missing first line, in pseudocode. Each `THEN` or `ELSE` statement should be on a separate line to the action resulting from it. The algorithm uses:

- W to store the result of X divided by Y
- Z to store the value of `INT(W)`.

The algorithm must output the values of Y and X together with an appropriate message if Y is a factor of X or if Y is **not** a factor of X.

.....

```
W←X/Y

Z=INT(W)
```

.....

.....

.....

.....

.....

..... [8]

10 The manager of the payroll department within a company has commissioned a computer programmer to write software to run the payroll.

Justify this decision to use custom written software.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [8]

Please turn over for Question 11.

11 Weather forecasting makes use of computer models.

Analyse the effectiveness of computer models for producing weather forecasts.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [8]