UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

COMPUTER STUDIES **7010/01**

Paper 1 **May/June 2009**

2 hours 30 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
No marks will be awarded for using brand names of software packages or hardware.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use

This document consists of **20** printed pages.

UNIVERSITY *of* CAMBRIDGE
International Examinations

[Turn over

1   Explain, using examples where appropriate, the meaning of these computer terms.

(a) batch processing

....

....

.... [2]

(b) data logging

....

....

.... [2]

(c) video-conferencing

....

....

.... [2]

(d) virtual reality

....

....

.... [2]

(e) virus

....

....

.... [2]

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2   Name **three** devices used for automatic data capture.

1 ....

....

2 ....

....

3 ....

.... [3]

3   (a) Give **three** features of a typical operating system.

1 ....

....

2 ....

....

3 ....

.... [3]

(b) Some microprocessor-controlled devices do **not** need an operating system.

(i)   Give **one** example of such a device.

.... [1]

(ii) Give **one** reason why it does **not** need an operating system.

....

....

.... [1]

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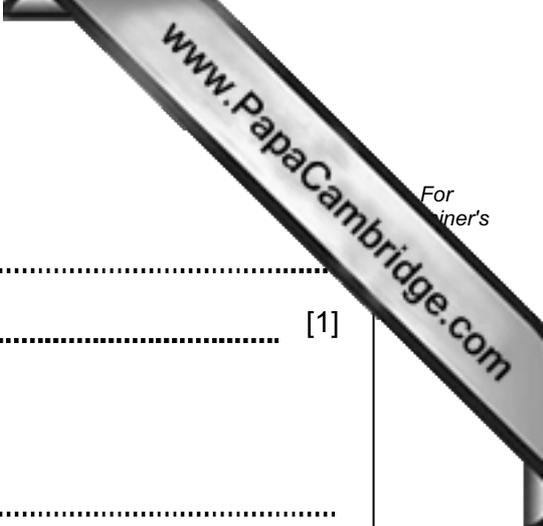
4 **(a)** What is an interrupt?

....

.... [1]

(b) How can an interrupt be generated?

....

....

.... [1]

(c) *An exchange of signals between two devices to allow communication to take place.*

What is this computer function?

.... [1]

5 **(a)** What is meant by the term *CAD*?

....

....

....

.... [2]

(b) Give **two** examples of the use of *CAD*.

1 ....

....

2 ....

.... [2]

6   Today, electronic mail (email) is used as a means of communication. Describe
    advantages and **one** disadvantage of using email.

    Advantage 1 ....

    ....

    ....

    Advantage 2 ....

    ....

    ....

    Advantage 3 ....

    ....

    ....

    Disadvantage ....

    ....

    ....

    .... [4]

7 Jon decides to buy a notebook (laptop) computer which he connects to the internet WiFi (wireless) broadband connection. Describe **four** security issues.

1 ....

....

....

2 ....

....

....

3 ....

....

....

4 ....

....

.... [4]

8 An electronics company employs five people to answer technical queries over telephone. The company has decided to develop a new system so customer queries answered using a website rather than by telephone.

(a) Describe **two** ways this change would affect the five employees.

1 ....

....

....

2 ....

....

.... [2]

(b) Describe **one** advantage to the company of introducing this system.

....

.... [1]

(c) Describe **two** advantages to the customer of using this system.

1 ....

....

2 ....

.... [2]

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iner's

9 A company produces animation effects using computers rather than producing manually.

(a) Describe **three** advantages of using computers to produce animation.

1 ....

....

....

2 ....

....

....

3 ....

....

.... [3]

(b) Each image takes about 400 kilobytes of storage. 25 images per second are produced. How much memory would be needed to store a 30-minute animation?

....

....

....

....

.... [2]

10 Expert systems help in medical diagnosis.

Describe the steps taken to create and test expert systems.

....

....

....

....

....

....

....

.... [4]

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iner's

11 Scientific experiments are carried out where temperatures are taken at the start and the end of each experiment. The volumes of gas being given off are also measured.

The spreadsheet shows the measurements taken.

	A	B	C	D	E	F
1	Experiment Number	Start Temperature	End Temperature	Temperature Rise	Gas Volume	Gas Volume/ Temperature Rise
2	1	15	25	10	50	5.0
3	2	18	31	13	70	5.4
4	3	20	35	15	90	6.0
5	4	18	35	17	110	6.5
6	5	21	39	18	120	6.7
7	6	16	36	20	125	6.3
8	7	19	39	20	125	6.3
9	8	20	40	20	125	6.3
10	Mean Temperature Rise =			16.6	Maximum Ratio	6.7

(a) What formula is in D2 to find the **Temperature Rise** for **Experiment Number 1**?

.... [1]

(b) What formula is in D10 to find the **Mean** (average) **Temperature Rise** for all the experiments?

....

.... [1]

(c) What formula is in F10 to find the **Maximum Ratio**?

....

.... [1]

(d) How could the formula in D2 be used in D3 to D9 without writing it out another seven times?

....

....

....

.... [2]

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(e) The following graph was produced from the spreadsheet.
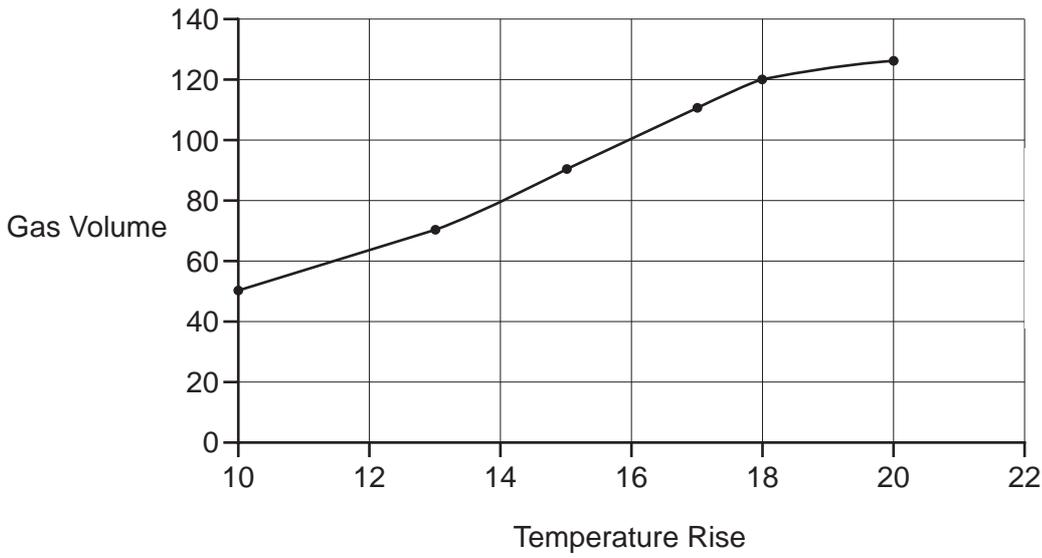
Which cells were highlighted to produce this graph?

....

....

....

.... [2]

(f) It was decided to link a computer to the apparatus so that all the results could be input directly and graphs produced automatically.

Give **two** advantages of doing this.

1 ....

....

2 ....

.... [2]

For iner's

12 **(a)** Robots are now used to do many jobs.

Describe **two** jobs and give a reason why robots are used.

Job 1 ....

....

....

Reason 1 ....

....

....

Job 2 ....

....

....

Reason 2 ....

....

.... [4]

(b) Given the present technology, describe **two** jobs which robots cannot do.

1 ....

....

....

2 ....

....

.... [2]

13 A company has decided to sell concert tickets on the internet rather than using agenc

Once the tickets are bought, the ticket confirmation and venue information are sent to th
customer and the customer prints the tickets.

(a) What **two** features would you expect to see on the company's website?

1 ....

....

2 ....

.... [2]

(b) How would the ticket information be sent to the customer?

....

....

.... [1]

(c) (i) How is it possible to ensure **each** ticket printed is unique?

....

.... [1]

(ii) How is it possible to prevent unauthorised tickets being used?

....

.... [1]

14 Study the flowchart very carefully.

```
                    ┌─────────┐
                    │  START  │
                    └────┬────┘
                         ▼
                    ┌─────────┐
                    │  T = 1  │
                    └────┬────┘
                         ▼
                    ╱─────────╲
                    │ INPUT N │
                    ╲─────────╱
                         ▼
         ┌─┐        ┌─────────┐
         │A│        │  X = 1  │
         └─┘        └────┬────┘
                         ▼
                    ┌───────────┐
                    │ T = T * X │
                    └─────┬─────┘
                          ▼
                    ┌───────────┐
                    │ X = X + 1 │
                    └─────┬─────┘
                          ▼
         ┌─┐         ╱─────────╲
         │B│        ╱   Is X =   ╲
         └─┘        ╲   N + 1?   ╱
              No     ╲─────────╱
                          │ Yes
                          ▼
                    ╱─────────╲     ┌────────┐
                    │ OUTPUT T │───▶│  STOP  │
                    ╲─────────╱     └────────┘
```
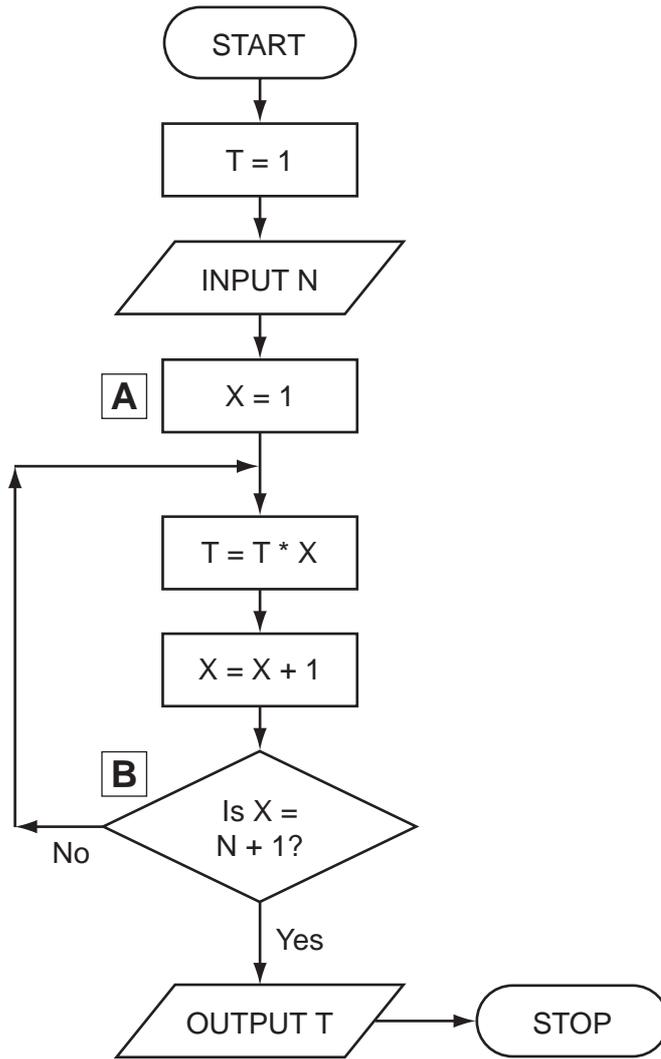
(a) Complete the table to show what outputs you would expect for the **two** inputs.

Input N	Output T
5	
1	

[2]

(b) Write down a possible LOOP construct for the section **A** to **B** in the flowchart using pseudocode.

....

....

....

.... [2]

15 Aeroplanes use on-board computer power to allow them to operate more efficien... safely.

(a) How is data during a flight collected and fed back to on-board computers?

....

....

....

.... [2]

(b) Why are computer systems thought to be safer than human pilots?

....

....

....

.... [2]

(c) However, pilots are still used on all flights. Why is this?

....

....

....

.... [2]

(d) What recent developments have led to more use of computer control in newly designed aeroplanes?

....

....

....

.... [1]
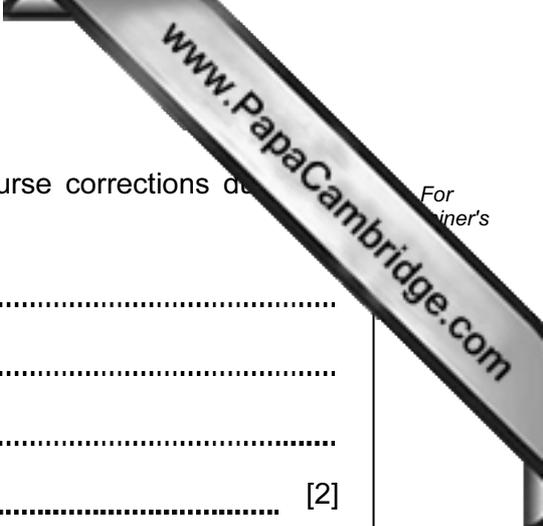
(e) Describe how the computer would know when to make course corrections d[...] flight.

For iner's

....

....

....

.... [2]

(f) At the airport, baggage check-ins use bar codes which are read by computers.

   (i) What information would be stored on the bar code?

     ....

     .... [1]

   (ii) Why do airports use the bar codes on baggage?

     ....

     .... [1]

16 The following flowchart shows what happens when a customer uses a credit card to [...] goods at a supermarket. Ten of the boxes are blank.

Using the items from the list, insert the **ten** missing statements using the appropriate [...] number only. Each statement may be used once only.

START

Insert credit card

Type in PIN

No → [ ] → **STOP**

Yes

No

Yes →

No

Yes →

No

Yes →

No

Yes

[ ] → [ ] → **STOP**

LIST OF STATEMENTS

1 are PIN details correct?
2 are there sufficient funds?
3 card removed
4 end transaction
5 is expiry date exceeded?
6 is card reported stolen?
7 money transfer takes place
8 print itemised bill
9 read credit card details
10 two computers communicate

[5]
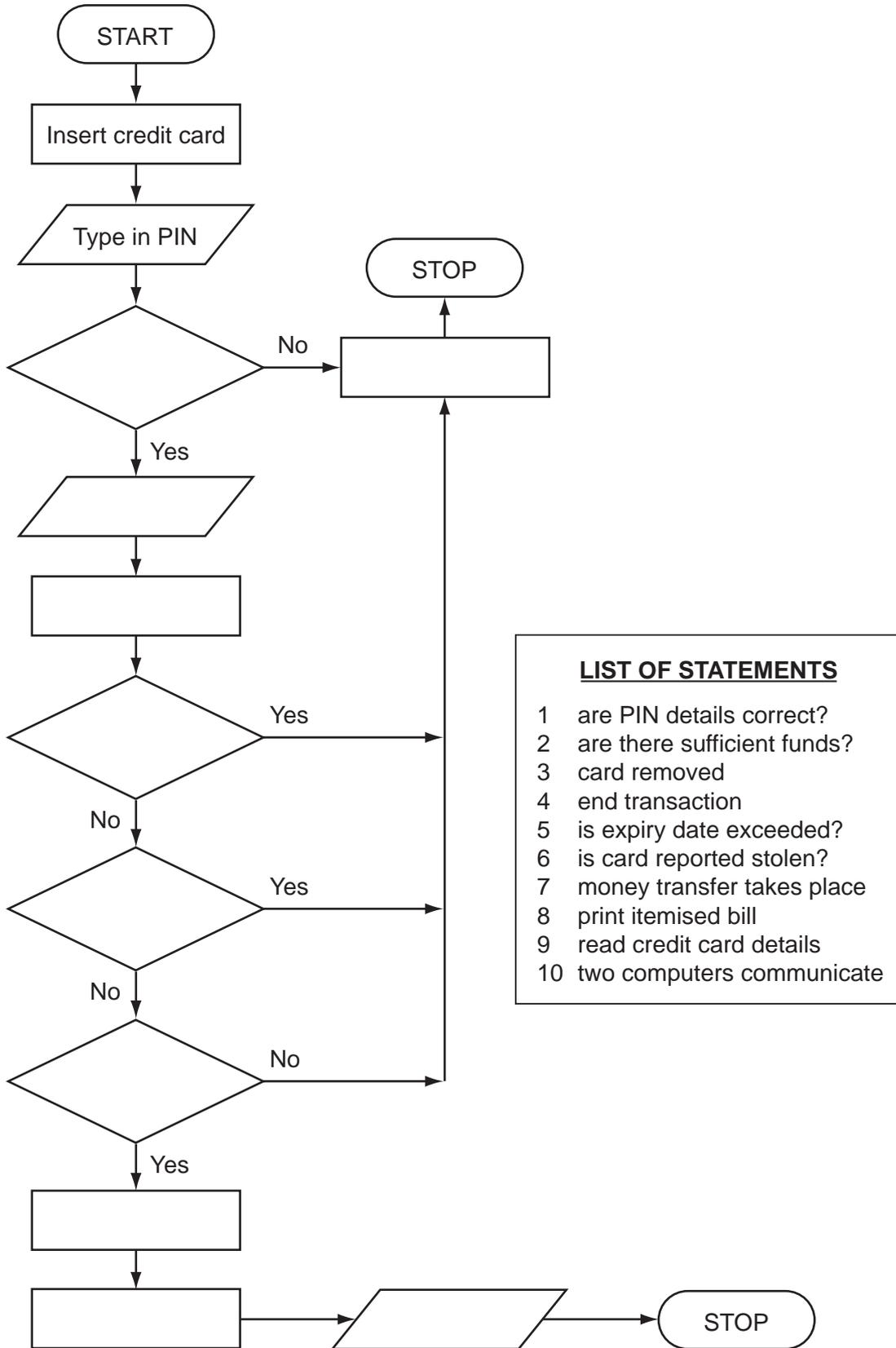
17 A car sales company uses a database.

Here are three tables from the database:

New Car Sales

Customer Reference	Car Ordered	Specification	Delivery Date
151319	Cancelled order	None	Not applicable
162154	VW Golf	21215168	December 2008
171216	BMW 320i	07981624	February 2009

Customer Details

Customer Reference	Customer Name	Customer Address	Trade In?
141516	J Smith	7 Toll Road	No
151319	M Kyle	14 Coast Road	No
162154	D Khan	19 Main Street	Yes
165196	S Gogic	555 Trabant Road	No
171216	D Marques	21 Lakki Harbour	Yes

Car Manufacturer

Specification	Car Description	List of Extras	Cost Price ($)
07981624	BMW 320i	C N O R V Z	48 500
21151198	VW Golf	A B C E T U	16 200
21215168	VW Golf	B D E F J L	21 000
31311115	Ford Focus	A P R S W	17 000

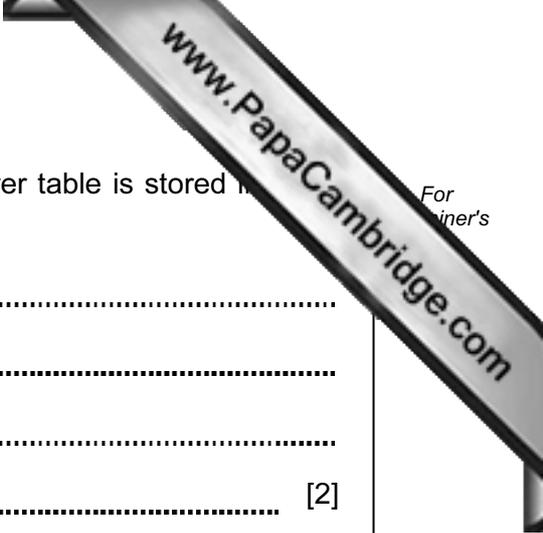**(a)** How many records are shown in the Customer Details table?

.... [1]

(b) (i) Which field connects the New Car Sales table with the Customer Details table?

.... [1]

(ii) Which field connects the New Car Sales table with the Car Manufacturer table?

.... [1]

(c) Give **two** reasons why **List of Extras** in the Car Manufacturer table is stored i
form.

1 ....

....

2 ....

.... [2]

(d) A customer goes into the showroom and the salesperson keys in *162154*. What fields
and information would be shown on the output screen?

....

....

....

.... [2]

(e) Give **one** advantage to the car sales company of holding customer information on a
database.

....

....

.... [1]

18 A small airport handles 400 flights per day from three airlines:

    FASTAIR   (code FA)
    SWIFTJET   (code SJ)
    KNIGHTAIR   (code KA)

Each flight is identified by the airline code and 3 digits. For example FA 156.

Write an algorithm, using pseudocode or otherwise, which monitors the 400 flights into and out of the airport each day. The following inputs, processing and outputs are all part of the monitoring process:

* input flight identification
* calculate number of flights per day for **each** of the three airlines
* output the percentage of the total flights per day by **each** airline
* any validation checks must be included

[5]