UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

3456579783

COMPUTER STUDIES **7010/12**

Paper 1 **October/November 2010**

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.

1 Explain, using examples where appropriate, the following **five** computer terms:

For Examiner's Use

(a)

Check digit .....

.....

..... [2]

(b)

RAM .....

.....

..... [2]

(c)

Macro .....

.....

..... [2]

(d)

USB flash memory .....

.....

..... [2]

(e)

Printer buffer .....

.....

..... [2]

For Examiner's Use

2 **(a)** State **three** reasons why a computer system failure might occur (malfunction).

1 .....

.....

.....

2 .....

.....

.....

3 .....

.....

..... [3]

(b) One effect of a computer system failure is the loss or corruption of files. State **one** way of recovering a file if it has been lost or corrupted.

.....

..... [1]

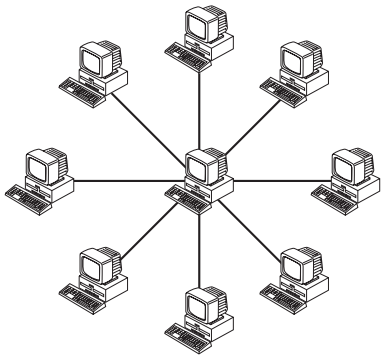
(c) How is it possible to ensure illegally accessed files are unreadable?

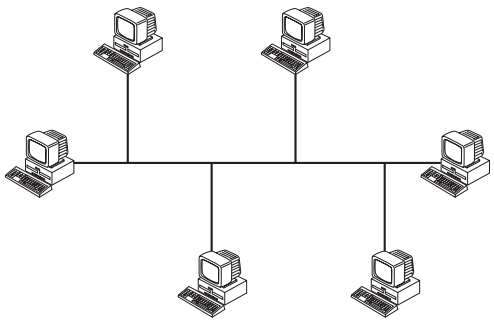
.....

..... [1]

For Examiner's Use

3 **(a)** Name the following network topologies:





Name: …… Name: ……..

[2]

(b) Give **one** advantage of having computers connected on a network.

……

…… [1]

(c) Give **one** disadvantage of having computers connected on a network.

……

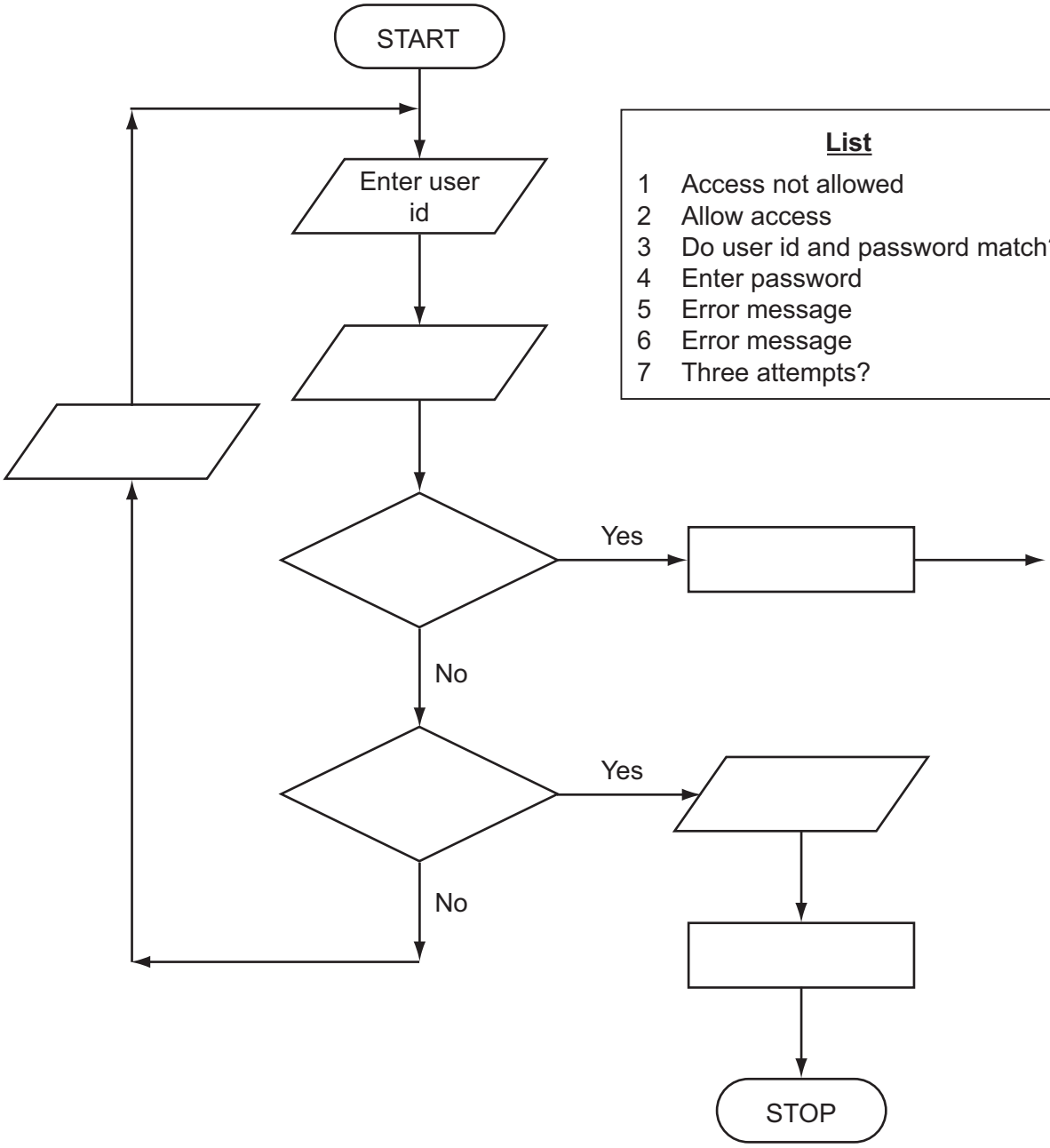
…… [1]

For Examiner's Use

4 **(a)** To log on to a computer, a user needs to type in a user id followed by a password; these should match up. Only three attempts are allowed.

The flowchart below shows the log on procedure. Several boxes have been left blank.

Complete the flowchart using items from the list.



List

1 Access not allowed
2 Allow access
3 Do user id and password match?
4 Enter password
5 Error message
6 Error message
7 Three attempts?

[3]

(b) Sometimes it is necessary to key in the password twice.

Name this type of data check.

.....

[1]

For Examiner's Use

5 A large cinema uses a computer system to control the air conditioning and also the day to day running of the business (such as booking seats).

(a) Using examples from the cinema application, explain the difference between *real time transaction processing* and *real time process control*.

.....

.....

.....

.....

.....

.....

..... [4]

(b) State **two** tasks carried out by an operating system.

1 .....

.....

2 .....

..... [2]

For Examiner's Use

6 A telephone company produces paper-based directories. It has decided to offer directory information to customers via a website.

(a) Give **one** advantage to the telephone company in doing this.

.....

..... [1]

(b) What **two** advantages does this new system offer the customer?

1 .....

.....

2 .....

..... [2]

(c) Give **one** disadvantage to the customer of having their details available on the Internet.

.....

..... [1]

(d) Describe **one** problem with the existing paper-based system that **would not** be resolved using the electronic version.

.....

..... [1]

[Turn over

For Examiner's Use

7 An arrivals board at an airport shows the following information:

Flight Number	Due	From	Information
BT 051	13:50	Sao Paulo	landed 13:45
HK 222	13:55	Hong Kong	baggage in hall
EU 009	14:00	Berlin	landed 14:00
TT 520	14:20	New York	delayed: expected 15:30

Data is input manually to update the arrivals board.

A new computer system is to be developed to replace the manual system.

(a) (i) How could a systems analyst find out what features customers would like to see in the new system?

.....

..... [1]

(ii) What would be the most suitable method to implement the new system? Give a reason for your choice.

Method .....

Reason .....

..... [2]

The information on the arrivals board is to be made available to customers at unmanned help desks located around the airport.

(b) All the existing information on the arrivals board will be available to customers. What other information would customers find useful?

.....

..... [1]

(c) It has been decided not to use keyboards at these help desks. Give **one** suitable input device that could be used at these help desks.

.....

..... [1]

(d) Give **two** advantages of using a computer system rather than a manual system.

For Examiner's Use

1 .....

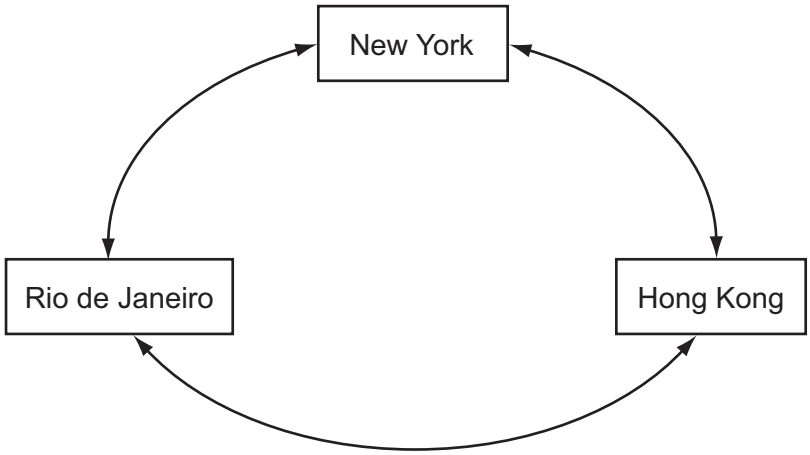
.....

2 .....

..... [2]

For Examiner's Use

8 A company has set up video conferencing facilities connecting Rio de Janeiro, New York and Hong Kong.



(a) Give **one** hardware item and **one** software item needed at **each** video conferencing location.

Hardware item .....

.....

Software item .....

..... [2]

(b) Describe **two** possible problems with this video conferencing set up.

1 .....

.....

2 .....

..... [2]

(c) Apart from travelling and accommodation costs, what **two** benefits does the company gain from using video conferencing facilities?

1 .....

.....

2 .....

..... [2]

9 The following algorithm inputs 20 numbers and outputs how many numbers were positive (> 0) and how many numbers were negative (< 0).

For Examiner's Use

```
1   negative = 1
2   positive = 1
3   for count = 1 to 20 do
4       input number
5       if number < 0 then negative = negative + 1
6       if number > 0 then positive = positive + 1
7       count = count + 1
8       print negative, positive
9   next count
```

There are **three** different errors in this algorithm.

Locate each error and give the reason why you think it is an error.

Error 1 .....

.....

Reason 1 .....

.....

Error 2 .....

.....

Reason 2 .....

.....

Error 3 .....

.....

Reason 3 .....

..... [6]

[Turn over

10 A database has been set up to store information about aircraft. A section is shown below.

For Examiner's Use

Ref No	Aircraft Name	Max Weight (kg)	Length (m)	Wing Span (m)	Max Speed (kph)
1001	An-225 Cossack	600 000	84	88	850
2001	Airbus A380F	591 950	73	80	951
3001	C-5 Galaxy	381 000	76	68	845
3002	Boeing 777-600	351 500	74	65	930
2002	Airbus A340-600	366 000	75	63	877
3003	Boeing 747	397 000	71	64	967
3004	Boeing 777	660 000	74	61	893
2003	Airbus A330-300	234 000	63	60	800
3005	Boeing 767	204 100	61	52	914
3006	B52 Fortress	221 400	49	56	927
3007	Boeing 757	123 400	54	38	914

(a) How many fields are in each record?

.....

[1]

(b) Using Ref No only, what records would be output if the following search condition was entered:

(Max Weight(kg) > 350 000) AND (Wing Span(m) < 66)?

.....

.....

[2]

(c) Write down the search condition to find out which aircraft have a length greater than 74 metres or have a maximum speed less than 900 kph.

.....

.....

.....

[2]

11 A road system is to be operated using computer-controlled traffic lights. Sensors are used as part of the control system.

For Examiner's Use

(a) The movement of traffic throughout the road system was first simulated on a computer.

Describe what data would need to be collected and how it would be used in the simulation.

.....

.....

.....

.....

.....

..... [3]

(b) Give **two** advantages of carrying out a simulation first before introducing a new system.

1 .....

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.....

2 .....

.....

..... [2]

(c) Describe how the sensors, traffic lights and computer interact to control the traffic flow in the new system.

.....

.....

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.....

..... [2]

[Turn over

12 A holiday resort is developing a website to inform the general public about their weather. A spreadsheet was produced to show some of the statistics:

For Examiner's Use

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Averages
2	Monthly Rainfall (mm)	130	210	340	350	220	170	100	30	25	20	10	50	138
3	Hours Sunshine (per day)	7	6	6	6	7	8	8	6	9	9	10	8	8
4	Minimum Temperature (C)	29	28	27	25	23	22	20	22	24	26	27	28	25
5	Maximum Temperature (C)	36	34	32	30	28	27	25	28	31	33	36	38	32
6	Sun Index	49	36	28	28	35	40	40	36	63	63	90	80	

(a) What formula is in N2 to show the average (mean) rainfall?

.....

[1]

(b) Row 6 shows the *Sun Index* which is the difference between *maximum temperature* and *minimum temperature* multiplied by *hours sunshine*. What formula is in L6 to calculate the sun index for November?

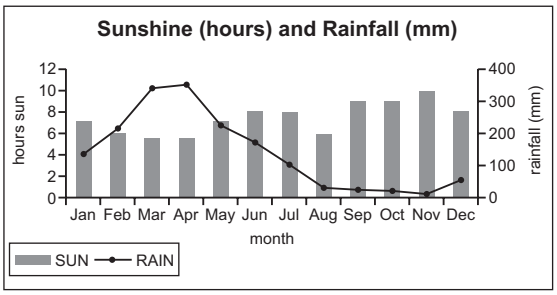
.....

[1]

(c) The resort wanted to show Hours Sunshine and Monthly Rainfall on one graph. Graphs A and B were produced:

For Examiner's Use

GRAPH A



(i) Which is the best graph for showing this information? Give a reason for your answer.

.....

.....

.....

.....

(ii) The resort wanted to include average Hours Sunshine on the graph. Describe how this could be done.

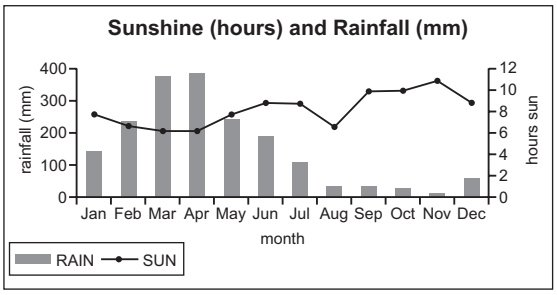
.....

.....

.....

..... [2]

GRAPH B



(d) Apart from the information shown already, what **two** features would you expect to see on the resort's website?

1 .....

.....

2 .....

..... [2]

13 Describe how an expert system is developed and made ready for use.

For Examiner's Use

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..... [4]

14 An international bank keeps records of customer account details on a computer.

For Examiner's Use

(a) It is necessary on occasions to:

- delete records
- amend records
- insert records

Give **one** example of when **each** of the above would need to be done.

Delete .....

.....

Amend .....

.....

Insert .....

..... [3]

(b) A section of one record is shown below:

Frederick Parez	Rua Silva Paulet	5151 315 000	34	20 − 15 − 00	Br
name	address	telephone number	age	branch	country

(i) The branch and country are coded. Give a reason for this.

.....

..... [1]

(ii) One of the six fields is not appropriate.

Name this field and give a reason for your choice. Suggest an improved field.

Name of field .....

Reason for choice .....

.....

.....

Improved field choice .....

..... [3]

[Turn over

15 A college secretary inputs data into fields on a computer screen as shown below:

For Examiner's Use

Examination Results	
Student Sex:	Subject:
Today's Date:	Grade:
Examination Result (%):	

(a) Choose a suitable **different** validation check for each of the following:

(i) Student Sex which can be M or F only

.....

.....

(ii) Today's Date which must be written as, for example, 15/10/2010

.....

.....

(iii) the Examination Result which can be any number from 0 to 100

.....

..... [3]

(b) Apart from validation, how would it be possible to ensure only certain data could be input into each of the fields on the computer screen?

.....

..... [1]

(c) The secretary takes a ten minute break every hour.

(i) Apart from switching off, how can the secretary make sure the computer system is secure whilst she takes a ten minute break?

.....

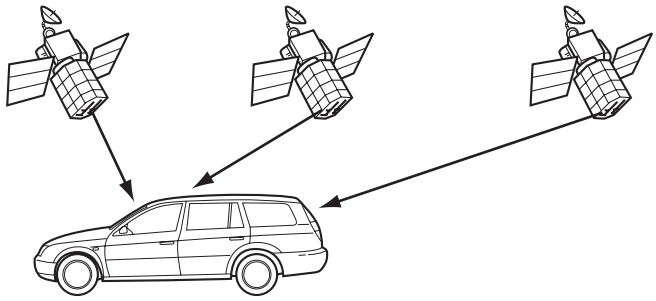
.....

(ii) From a health and safety aspect, why does the secretary need to take regular breaks?

.....

..... [2]

16



Satellite navigation systems are used to give the vehicle driver directions.

(a) How does the system know the exact position of the vehicle?

.....

.....

.....

.....

.....

.....

..... [3]

(b) Give **two** advantages to the driver of using this system.

1 .....

.....

2 .....

..... [2]

(c) Give **one** problem associated with satellite navigation systems.

.....

..... [1]

(d) Name **one** other different form of transport which could use satellite navigation systems.

.....

..... [1]

For Examiner's Use

[Turn over

17 A school is doing a check on the heights and weights of all its students. The school has 1000 students.

For Examiner's Use

Write an algorithm, using pseudocode or a flowchart, which

- inputs the height and weight of all 1000 students
- outputs the average (mean) height and weight
- includes any necessary error traps for the input of height and weight

[5]