UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

4623671366

COMPUTER STUDIES **0420/01**

Paper 1 **October/November 2008**

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 paper.

For Examiner's Use

This document consists of **16** printed pages.

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

(a) mouse

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..... [2]

(b) search engine

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..... [2]

(c) buffer

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..... [2]

(d) RAM

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..... [2]

(e) download

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..... [2]

2 Describe **two** benefits of using top down design to develop computer software.

1 .....

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2 .....

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..... [2]

3 Write a routine using a **for … to** loop which inputs 100 numbers and outputs how many of the numbers were negative.

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..... [3]

4 Computer systems can be affected in various ways which could lead to data corruption.

Give **two** ways that data might be corrupted and suggest a method of protection for each.

Corruption 1 .....

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Protection method 1 .....

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Corruption 2 .....

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Protection method 2 .....

..... [4]

5 Describe **two** ways in which computers have affected how music is written and produ

1 .....

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2 .....

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..... [2]

6 A supermarket uses a computer system to control and order stock. All products sold are identified with a bar code which can be read at a Point Of Sale (POS) terminal.

(a) Apart from stock control, give **one** advantage to the supermarket of having bar codes on the products.

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..... [1]

(b) Give **one** advantage to the customer of using POS technology.

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..... [1]

(c) Describe how a computerised stock control system works.

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..... [3]

7 Many people now bank through the Internet rather than using banks located in towns.

(a) Give **one** advantage to a bank that offers Internet banking.

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..... [1]

(b) Give **one** disadvantage to a bank that offers Internet banking.

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..... [1]

(c) Give **two** advantages to customers of using Internet banking.

1 .....

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2 .....

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..... [2]

(d) Give **two** disadvantages to customers of using Internet banking.

1 .....

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2 .....

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..... [2]

8 To gain access to a database, a user must first type in a user ID and then a pa
which needs to be verified.

(a) How is a password usually verified?

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..... [1]

(b) In spite of these safeguards, unauthorised access to the database is still possible. What could be done:

(i) to prevent data being used by unauthorised people?

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..... [1]

(ii) to prevent loss of data once the database has been illegally accessed?

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..... [1]

(c) Personal data is protected to some extent by a Data Protection Act. Give **two** requirements of a Data Protection Act.

1 .....

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2 .....

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..... [2]

9 Many computer networks use the RING and STAR configurations.

Compare the advantages and disadvantages of both types of networks. Include diagrams
the ring and star configurations to help in your discussion.

Diagram of ring network **Diagram of star network**

Advantages and disadvantages of star networks .....

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Advantages and disadvantages of ring networks .....

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..... [5]

10 A large city has decided to computerise totally its traffic management system. Traffic li
and electronic road signs are now under automatic computer control.

(a) Sensors are placed around the city to gather information about traffic. Describe what information would need to be gathered.

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..... [2]

(b) Describe **two** ways the information from the sensors could be sent to the central computer which is located several miles away.

1 .....

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2 .....

..... [2]

(c) Give **two** advantages of having the traffic in the city controlled in this way.

1 .....

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2 .....

..... [2]

11 Mike has decided to send information to Asif by attaching a file to an email.

(a) Describe what happens after Mike writes his email, attaches the file and clicks o "send".

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..... [2]

(b) Describe **two** potential problems when sending attachments via emails.

1 .....

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2 .....

..... [2]

12 **(a)** A small shop selling books, CDs and DVDs uses a number of spreadsheets t track of its stock. One of the spreadsheets showing Sci-Fi stock is shown below.

	A	B	C	D
1		Sci-Fi	Stock	
2	Item Code	Item Cost ($)	Number in stock	Stock value ($)
3	15131624	25.00	15	375.00
4	18316925	16.50	10	165.00
5	18560003	30.00	10	300.00
6	12111151	12.50	20	250.00
7	00516344	11.50	20	230.00
8	15821612	17.00	15	255.00
9	10322491	23.50	20	470.00
10			Total Value	2045.00

(i) How many columns are there in the above spreadsheet?

..... [1]

(ii) What formula must be in D3 to calculate the stock value of item 15131624?

..... [1]

(iii) What formula needs to be placed in cell D10 to calculate the total value of the stock?

..... [1]

(iv) Data in B7 was found to be incorrect. The value in this cell was changed to 12.50. Which cells would automatically change when this was done?

..... [1]

(b) The owners have decided to sell the shop and all its stock. They will produce a word processed report to advertise the sale.

Describe how the owners will create this report which will contain text, data from the stock spreadsheets, pictures of the shop and some of its stock.

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..... [3]

13 A large car showroom employs a systems analyst to computerise their existing manu
systems.

(a) Write down **four** of the stages in Systems Analysis.

1 .....

2 .....

3 .....

4 ..... [4]

(b) Describe **two** effects on the workforce of introducing the new computer system.

1 .....

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2 .....

..... [2]

(c) Give **two** benefits to the car showroom of allowing customers to access details of cars for sale using the Internet.

1 .....

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2 .....

..... [2]

14 Describe **three** of the stages taken to create an expert system to help in medical diagnosis.

1 .....

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2 .....

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3 .....

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..... [3]

15 A database has been produced showing solar system statistics.

Name of planet	Distance from sun ($x10^6$) (km)	Number of moons	Number of rings	Maximum surface temperature (°C)	Diameter (km)
Mercury	58	0	0	427	4880
Venus	108	0	0	480	12100
Earth	150	1	0	58	12756
Mars	228	2	0	17	6787
Jupiter	778	16	3	-150	143200
Saturn	1427	18	1000	-180	120000
Uranus	2871	15	11	-210	51800
Neptune	4497	8	4	-214	49528
Pluto	5914	1	0	-220	2330

(a) How many records are there in this database?

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[1]

(b) The following search condition was typed in:

(**Number of moons** > 0) AND (**Diameter (km)** < 15000)

Using **Name of planet**, write down the results of this search:

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[2]

(c) Write down a search condition to find out which planets have rings or have a diameter more than 50000 km.

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[2]

(d) Name a **different** validation check for each of the following fields.

(i) Maximum surface temperature (^{0}C)

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(ii) Name of planet

.....

[2]

(e) The data in the database was sorted in descending order using the **Number of** field. Using **Name of planet** only, write down the results of this sort.

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..... [2]

16 **(a)** What is meant by virtual reality?

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..... [1]

(b) Describe **two** special devices that are used for man–machine interaction in virtual reality systems.

1 .....

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2 .....

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..... [2]

(c) Give **two** examples of typical output from a virtual reality system.

1 .....

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2 .....

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..... [2]

(d) Give **one** example of a use of virtual reality.

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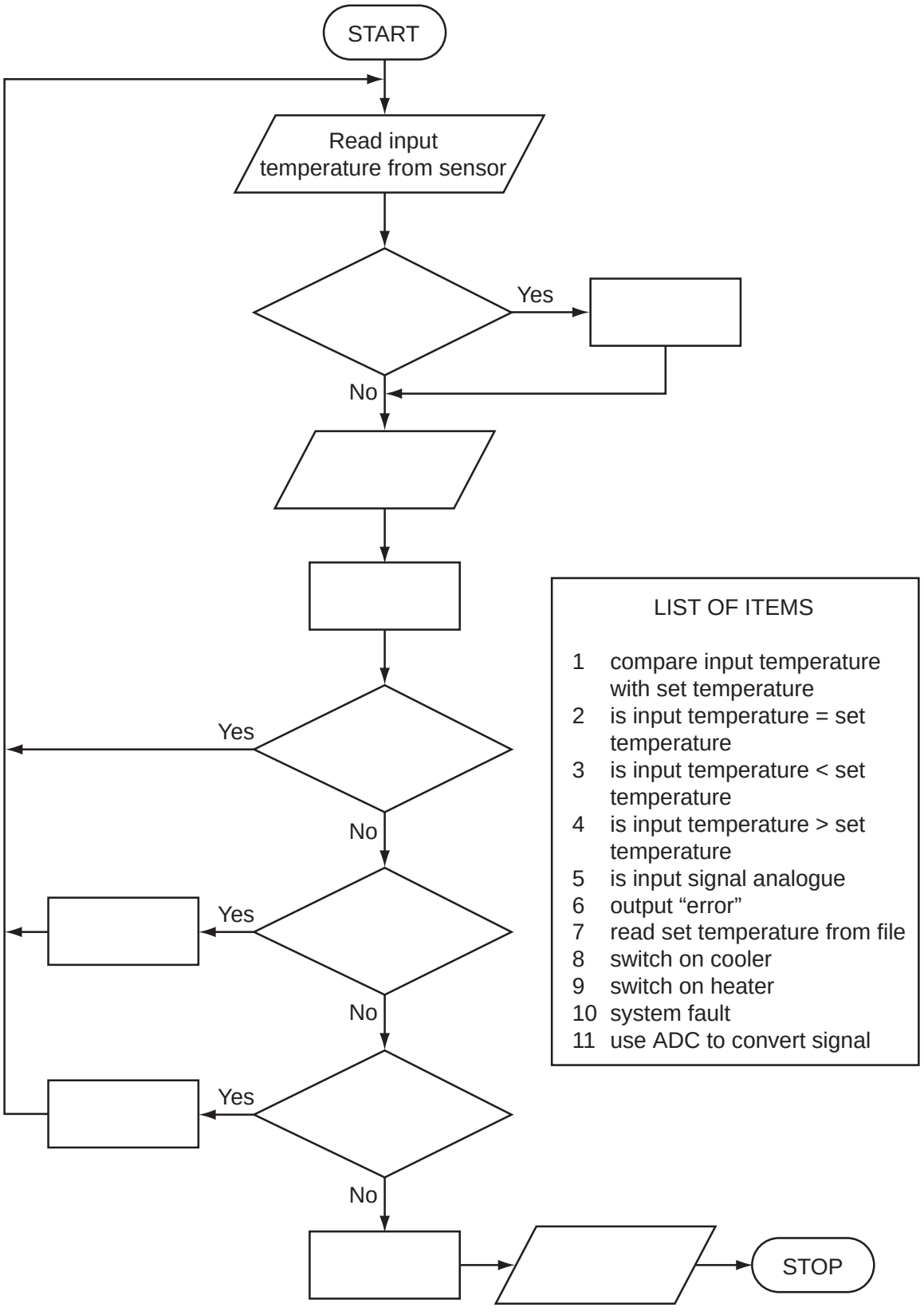
..... [1]

17 The following flowchart shows how sensors (which can be analogue or digital) computer are used to control the temperature of a greenhouse for plants. Complete flowchart using the items from the list below.



LIST OF ITEMS

1 compare input temperature with set temperature
2 is input temperature = set temperature
3 is input temperature < set temperature
4 is input temperature > set temperature
5 is input signal analogue
6 output “error”
7 read set temperature from file
8 switch on cooler
9 switch on heater
10 system fault
11 use ADC to convert signal

[6]

18 A small library uses a database to monitor books being borrowed. Two of the tables database are linked together:

- books borrowed by the customers
- customer details

Each customer has a library card containing a unique customer code. Each book contains a unique bar code.

(a) Which data item could link the two tables together?

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..... [1]

(b) Today's date is 11 November 2008. Describe how the system would decide automatically which books were overdue and how the customers could be contacted to return the overdue books.

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..... [3]

19 The manufacturing cost of producing an item depends on its complexity. A co
manufactures three different types of item, with costs based on the following calculation

Item type 1: item cost = parts cost * 1.5
Item type 2: item cost = parts cost * 2.5
Item type 3: item cost = parts cost * 5.0

The company makes 1000 items per day.

Write an algorithm, using pseudocode, flowchart or otherwise, which

- inputs the item type and parts cost of each item
- outputs the item cost for each item
- calculates and outputs the average (mean) item cost per day (based on 1000 items being made).

[5]