Centre Number	Candidate Number	Name

CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

COMPUTER STUDIES **0420/01, 0421/01**

Paper 1

October/November 2003

2 hours 30 minutes

Candidates answer on the Question Paper.
Additional Materials: As listed in Instructions to Supervisors

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 in the spaces provided on the Question Paper.
You may use a soft pencil for any diagrams, graphs, music or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.
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.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

For Examiner's Use

This document consists of **15** printed pages and **1** blank page.

UNIVERSITY of CAMBRIDGE
Local Examinations Syndicate

[Turn over

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

(a) buffer

.....

.....

.....[2]

(b) verification

.....

.....

.....[2]

(c) gigabyte

.....

.....

.....[2]

(d) batch processing

.....

.....

.....[2]

(e) file generations

.....

.....

.....[2]

2 A computer system is described as having the following features:

512 Mbyte RAM

internal modem

A4 colour scanner

(a) State the purpose of each of these.

RAM .....

.....

.....

modem .....

.....

.....

scanner .....

.....

.....[3]

(b) State **two** other types of hardware which would be required for electronic conferencing.

1 .....

2 .....[2]

[Turn over

3 Hackers can gain illegal access to computer systems.

(a) State **two** effects of computer hacking, other than changing, deleting or copying data.

1 .....

.....

2 .....

.....[2]

(b) State **two** ways in which users can protect their computers against hacking.

1 .....

.....

2 .....

.....[2]

4 A small company has decided to link several stand-alone computers together to form a Local Area Network (LAN).

(a) State **two** advantages of LANs.

1 .....

.....

2 .....

.....[2]

(b) State **two** disadvantages of LANs.

1 .....

.....

2 .....

.....[2]

5 Customers of a bank are issued with plastic credit cards which have a magnetic stripe on the back.

(a) Give **two** items of information stored on the magnetic stripe.

1 .....

2 .....[2]

(b) To help prevent forgeries, the credit card has security features. State **two** of these features.

1 .....

.....

2 .....

.....[2]

(c) Credit cards can be used to obtain cash from an Automatic Teller Machine (ATM). Explain why a PIN is needed to obtain cash from this machine.

.....

.....

.....[2]

6 A large company decides to convert all its offices from a paper-based system to an electronic-based system. Unions are concerned about the possibility of electronic scabbing.

(a) Explain electronic scabbing.

.....

.....

.....[2]

(b) Give **three** problems, other than electronic scabbing, which may arise when changing over to the electronic office.

1 .....

.....

2 .....

.....

3 .....

.....[3]

7 A systems analyst has recommended that Mr Page computerises his book sales business. Give **three** items of documentation which the systems analyst would need to provide when the system is implemented.

1 .....

.....

2 .....

.....

3 .....

.....[3]

8 A company has decided to produce some educational software.

(a) Give **two** reasons why the company has decided to produce the software on CD-ROM rather than on floppy disk.

1 .....

.....

2 .....

.....[2]

(b) The company is thinking of sending out advertising literature about its new software. State **two** advantages and **two** disadvantages to the company of using e-mail rather than normal post.

Advantages

1 .....

.....

2 .....

.....

Disadvantages

1 .....

.....

2 .....

.....[4]

9 A mail order company selling hi-fi equipment keeps details of its stock on a database. Part of the database is shown below.

Code_Num	Colour	Speakers	Power(W)	Num_of_CDs	Price ($)
13416	Black	4	50	4	650
13425	Silver	2	60	1	500
13504	Silver	4	80	5	750
14001	Black	4	100	3	1100
14005	Black	4	100	10	1200
14010	Silver	2	40	1	350

(a) Which field should be used as the key field?

.....[1]

(b) Which **Code_Num** data will be listed if the following search condition is input?

(**Speakers**=4) AND (**Num_of_CDs**>4)

.....

.....

.....

.....[2]

(c) Write down a search condition to find all the equipment which is silver coloured or has a power rating over 70W.

.....

.....[3]

(d) Write down the order of the **Code_Num** after the **Price($)** field has been sorted in ascending order.

.....

.....[2]

10 A salesman travels around the country by car or by rail. He keeps a record of his costs and distance travelled for both forms of transport using a spreadsheet. The first six months are shown below.

	A	B	C	D	E	F	G
1	Month	Car costs ($)	Car Distance (km)	Car cost per km	Rail costs ($)	Rail Distance (km)	Rail cost per km
2	Jan	305	1600	=B2/C2	475	3100	
3	Feb	295	2100	=B3/C3	315	2000	
4	Mar	204	2050	=B4/C4	290	1550	
5	Apr	655	2210	=B5/C5	280	1450	
6	May	118	1450	=B6/C6	420	2500	
7	Jun	355	2480	=B7/C7	310	1950	
8	Totals						

(a) Give the cell reference for a cell which contains;

(i) a label .....

(ii) a formula .....

(iii) a data item .....[3]

(b) **(i)** What formula needs to be placed in **G2** to allow the Rail cost per km to be calculated.

.....[1]

(ii) Explain how you would insert the formulae in cells **G3** to **G7** without typing each one in separately.

.....

.....

.....

.....

.....[2]

(c) State a formula which needs to be inserted in **B8** to calculate the total car costs for the first 6 months.

.....

.....[1]

(d) Explain how the costs of both forms of transport could be predicted for the whole year.

.....

.....

.....

.....[2]

11 The following algorithm inputs air speeds (which must be in multiples of 100) and outputs a suitable message.

```
1   input a speed
2   whole = speed/100
3           case whole of
4               0,1,2 : result = slow
5           3, 4, 5, 6 : result = normal
8             7, 8, 9 : result = high
7           otherwise whole = -1
8   endcase
9   if whole = -1 then
10          output "abnormal reading"
11  else output result, "speed"
```

(a) Dry run the above algorithm for the following Input data and complete the Output column in the table:

Input	Output
150	
400	
800	

[3]

(b) State what would happen if line 2 had been missed out of the algorithm.

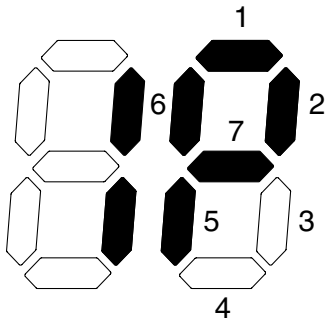
.....

.....

.....

.....[2]

12 Two 7 segment displays are used on a car dashboard to give information to the driver. Each segment is numbered as shown.



(1) (2)

For example, the information **1P** shown above is represented by:

	7	6	5	4	3	2	1	0
(1)	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**

and by:

(2)	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**0**

Bit 0 is always zero

(a) What is being displayed to the driver if bytes (1) and (2) are showing?

(1)	**1**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	.....

(2)	**1**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	.....

[2]

(b) What bit patterns must be used to show the information **0L**?

(0)								

(L)								

[2]

(c) Most of the other information on the dashboard is in analogue form.

(i) State **one** advantage of displaying information in analogue form.

.....

.....[1]

(ii) State **one** disadvantage of displaying information in analogue form.

.....

.....[1]

13 **(a)** An expert system is to be created for use in mineral prospecting. List the steps that need to be taken to do this.

.....

.....

.....

.....

.....

.....[4]

(b) State **two** features you would expect to find in the user interface of this expert system.

.....

.....

.....

.....[2]

14 A chemical reaction is being controlled by a computer system.

(a) State **three** items of specialist hardware which are needed.

1 .....

.....

2 .....

.....

3 .....

.....[3]

(b) Describe the role of feedback in this control system.

.....

.....

.....

.....[2]

(c) State **two** advantages of controlling the reaction using a computer.

1 .....

.....

.....

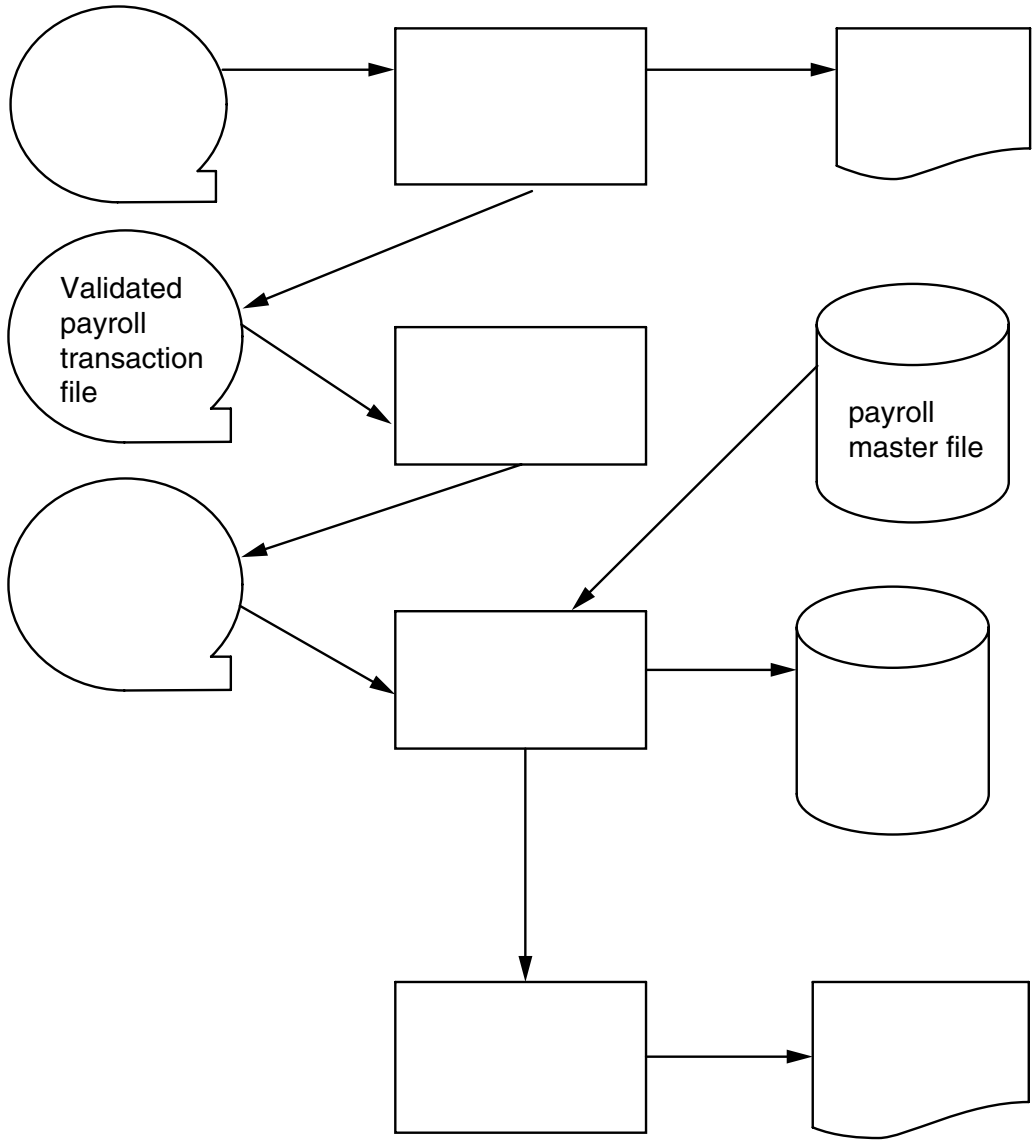
2 .....

.....

.....[2]

15 The following systems flowchart shows the update of a payroll system and the production of payslips. Using the following statements, label the diagram below.

calculate pay	sorted transaction file
error report	update
printed payslips	updated master file
payroll transaction file	validation
sort	



[6]

16 (a) Write an algorithm, using pseudocode or otherwise, which;

- inputs 50 numbers
- checks whether each number is in the range 1000 to 9999
- outputs how many of the input numbers were out of range
- outputs the percentage of input numbers which were out of range.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[6]

(b) Describe, using examples, **two** validation checks other than range check which could be carried out on the input numbers.

validation check 1.....

example.....

.....

.....

validation check 2.....

example.....

.....

.....[4]

BLANK PAGE