Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

COMPUTER STUDIES **0420/01**

Paper 1

May/June 2006

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.

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 **15** printed pages and **1** blank page.

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

(a) smart card .....

.....

..... [2]

(b) relational database .....

.....

..... [2]

(c) Read Only Memory (ROM) .....

.....

..... [2]

(d) de-skilling .....

.....

..... [2]

(e) top-down design .....

.....

..... [2]

2 State **two** features that are available on a digital phone.

1 .....

.....

2 .....

..... [2]

3 **(a)** Give **one** effect of hacking.

.....

..... [1]

(b) Give **two** ways of protecting computer systems against hacking.

1 .....

.....

2 .....

..... [2]

4 Give **three** file management tasks that are done by a computer operating system.

1 .....

.....

2 .....

.....

3 .....

..... [3]

5 **(a)** Give **two** ways that computers can help teachers teach a lesson.

1 .....

.....

2 .....

..... [2]

(b) Give **two** ways that teachers could use a computer system to send work electronically to students who are absent from a lesson.

1 .....

.....

2 .....

..... [2]

[Turn over

6 **(a)** Give **two** benefits of using a high-level language for writing programs.

1 .....

.....

2 .....

..... [2]

(b) State **one** type of program that would be written in a low-level language rather than a high-level language and give a reason why.

Type .....

Reason .....

.....

..... [2]

7 The spreadsheet shows the computer equipment on loan to a staff member in a company. Cells B13 and C7:E13 contain formulae.

	A	B	C	D	E
1					
2	PC Software Development Ltd				
3				Ref:	2106
4	Computer equipment on loan to:			S. Harrison	
5					
6	Item	Year 1	Year 2	Year 3	Year 4
7	PC system	1600	800	400	200
8	Notebook computer	1000	500	250	125
9	Hand-held computer	320	160	80	40
10	Laptop case	80	40	20	10
11	PC cover	16	8	4	2
12	Mouse mat	8	4	2	1
13	Total value ($)	3024	1512	756	378
14					

(a) State a cell that contains a data item.

.....[1]

(b) Describe how the numbers in the range of cells **B7**:**E13** can be changed to include money symbols.

.....

.....[2]

(c) Give a formula that could be in cell **B13** to calculate the total value of the equipment in Year 1.

.....[1]

(d) Each year the value of the equipment is halved. State a formula that could be in cell **C7** to calculate the value of the PC system in Year 2.

.....[1]

(e) If the value in cell **B10** is changed to 60, state all the cells where the values would change automatically.

.....[2]

(f) On the spreadsheet diagram shade the cells that must be selected in order to create and label a chart showing the Total value ($) of the computer equipment for Years 1, 2, 3 and 4. [2]

[Turn over

8 Data-logging is used for monitoring the level of oxygen in a river.

(a) State **one** item of hardware that is used to collect the oxygen data.

.....[1]

(b) Explain how the oxygen data is processed by the computer.

.....

.....

.....

.....[2]

(c) State **two** ways that the oxygen data could be displayed for a user to understand.

1 .....

2 .....[2]

(d) Explain what the computer would do if the amount of oxygen in the water is too high.

.....

.....[1]

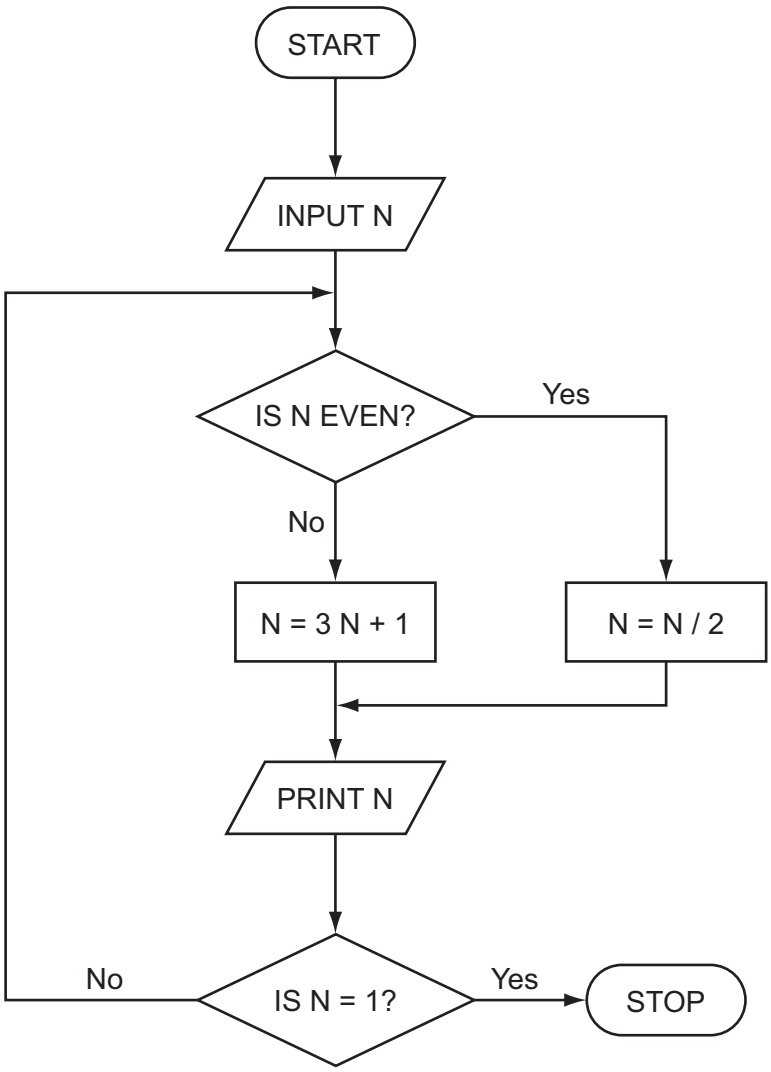
(e) Give **two** advantages of using data-logging for monitoring the oxygen data in a river.

1 .....

2 .....[2]

For Examiner's Use

9



Trace the flow chart using the numbers 2 and 3. Write down each of the values of N in the order that they are printed out.

(a) 2 ..... [1]

(b) 3 .....

..... [2]

10 Many bank customers now bank on-line using the Internet.

(a) State **two** advantages for the bank of on-line banking.

1 .....

.....

2 .....

..... [2]

(b) State **two** disadvantages for a bank customer of on-line banking.

1 .....

.....

2 .....

..... [2]

(c) State **three** data protection rules that could apply to the customer data stored on a bank computer system.

1 .....

.....

2 .....

.....

3 .....

..... [3]

11 A mail order company is considering using a computer system for stock control and order processing.

(a) Give **two** fact finding methods that would be used.

1 .....

.....

2 .....

..... [2]

(b) Give **two** items that would be included in the feasibility report.

1 .....

.....

2 .....

..... [2]

(c) Give **three** tasks that would be done at the design stage.

1 .....

.....

2 .....

.....

3 .....

..... [3]

(d) Describe **one** way that the conversion from the old system to the new system could be done.

.....

..... [1]

12 A music club keeps its members' details on a computer file.

(a) Complete the table below which shows the data type, field length and validation check used for the club members' data.

	Data type	Field length	Validation check
Name			
Address			
Date of birth			
E-mail address			

[4]

(b) New members can join the music club by completing an application form on the club website.

Using the screen below design a web page which shows:

- the form for collecting new members' details
- a link to another web page listing events for the year.

[5]

(c) Each member is given a reference number. Give **one** reason why the reference number must be unique.

.....

..... [1]

(d) Give a situation when a record would be amended.

..... [1]

(e) State the type of file access that is used to update a record.

..... [1]

13 Expert systems are used for fault diagnosis.

(a) Explain how an expert system could be used to advise a technician on how to repair a computer that is no longer working.

.....

.....

.....

.....

.....

.....

..... [3]

(b) Give **two** applications, other than fault diagnosis, that use an expert system.

1 .....

2 ..... [2]

14 Batch processing is used for producing electricity bills.

(a) Give **two** reasons why batch processing is used rather than real-time processing for producing electricity bills.

1 .....

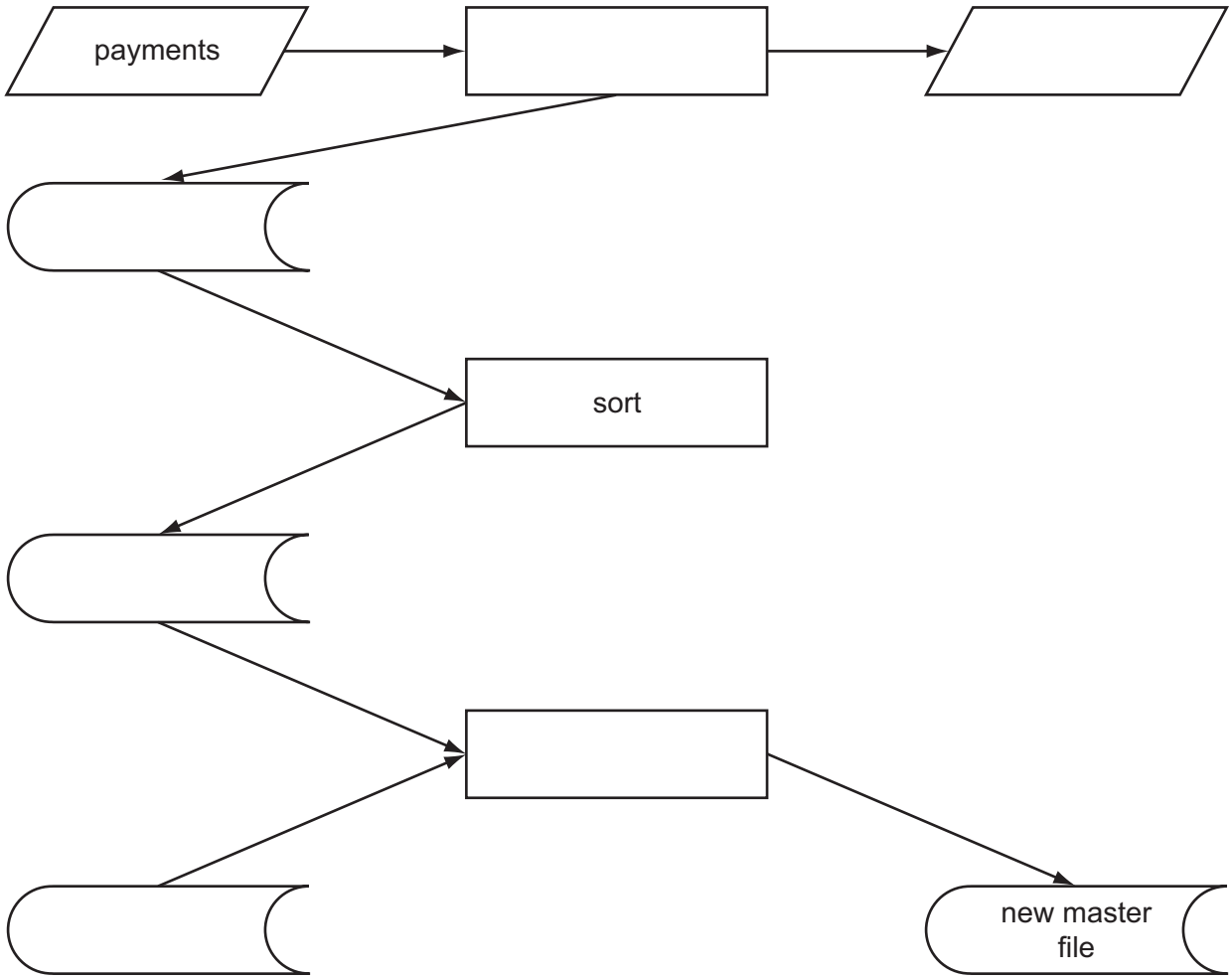
.....

2 .....

..... [2]

(b) Select words from the list below to complete the systems flowchart for electricity bill payments.

errors	master file	sorted transaction file
update	validate	validated transaction file



[6]

(c) Describe how a master file could be recovered after a systems failure.

.....

.....

..... [2]

15 (a) Give **four** features of a computer-aided design (CAD) program that could be used to design a water jug.

1 .....

.....

2 .....

.....

3 .....

.....

4 .....

..... [4]

(b) Give **one** benefit for a manufacturer of using a computer-aided design/computer-aided manufacture (CAD/CAM) system.

.....

..... [1]

16 (a) A formula for calculating the body mass index (BMI) is:

$$\text{BMI} = \frac{\text{weight in kilograms}}{(\text{height in metres}) \times (\text{height in metres})}$$

Calculate the BMI for a person whose weight is 80kg and height is 2 metres.

.....

..... [1]

(b) Using pseudocode or otherwise, write an algorithm that will input the ID, weight (kg) and height (m) of 30 students, calculate their body mass index (BMI) and output their ID, BMI and a comment as follows:

A BMI greater than 25 will get the comment 'OVER WEIGHT', a BMI between 25 and 19 (inclusive) will get 'NORMAL' and a BMI less than 19 will get 'UNDER WEIGHT'.

[6]

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