

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

COMPUTER STUDIES

Paper 1



0420/01

May/June 2005

2 hours 30 minutes

Candidates answer on the Question Paper.

Additional Materials: As listed in Instructions to Supervisors

Candidate
Name

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Centre
Number

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Candidate
Number

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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.

DO NOT WRITE IN THE BARCODE.

DO NOT WRITE IN THE GREY AREAS BETWEEN THE PAGES.

For Examiner's Use

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



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

(a) buffer
.....
..... [2]

(b) gateway
.....
..... [2]

(c) validation
.....
..... [2]

(d) polling
.....
..... [2]

(e) data-logging
.....
..... [2]

2 State **three** tasks done by the operating system.

1.....
.....
.....
2.....
.....
.....
3.....
.....
..... [3]

3 Data Protection Rules give legal rights to individuals and state that personal data stored on computer systems must be kept secure.

(a) Give **one** legal right for individuals.

.....
.....[1]

(b) Give **one** software method of protecting personal data.

.....
.....[1]

(c) Give **one** hardware method of protecting personal data.

.....
.....[1]

4 (a) A digital camera contains a microprocessor. State the input and the processing done by the microprocessor when a person takes a photograph.

Input

Processing

.....[3]

(b) State **two** reasons why the photograph costs less using the digital camera than it would cost if a non-digital camera was used.

1

.....

2

.....[2]

- 5 A shop keeps its stock file on a computer system. Part of the file is shown in the diagram below:

STOCK NO	DESCRIPTION	COLOUR	WEIGHT (KG)	IN STOCK	PRICE (\$)
L801	Laptop Case	B	1.6	15	100
L802	Beauty case	B	2.6	12	80
L803	Carry-on case	B	2.0	18	160
L807	Day pack	R	0.6	22	90
L808	Rucksack	G	1.8	16	60
L809	Backpack	B	3.8	17	76
L814	Portfolio	B	0.4	20	25
L816	Travel bag	G	4.3	16	70
L817	Roller bag	B	2.7	19	180
L820	Deluxe case	S	2.6	12	165

The following codes have been used.

B = Black G = Green R = Red S = Silver

- (a) State how many records are shown in the diagram.

.....[1]

- (b) State **two** advantages of coding the data in the COLOUR field.

1

.....

2

.....[2]

- (c) State the data type that should be used for the WEIGHT (KG) data.

.....[1]

- (d) State **one** advantage of using fixed-length records for storing the data.

.....

.....[1]

(e) Which STOCK NO data will be listed if the following search condition is input?

(COLOUR NOT "B") AND (WEIGHT (KG) < 2.0)

.....[2]

(f) Write down a search condition that will search for all the items with less than 16 in stock and the price is more than \$100.

.....[3]

(g) State which field should be used to link this stock file to a supplier file. Give a reason for your choice of field.

Field

Reason

.....[2]

- 6 The following spreadsheet shows the 2-Night Bargain Break holiday bookings during a three month period.

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	A	B	C	D	E	F
1	<u>2-Night Bargain Break Holiday Bookings</u>					
2						
3	<u>Priced at \$</u>	100				
4		<u>Bookings</u>				
5	<u>Hotel</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Total Bookings</u>	<u>Income (\$)</u>
6						
7	Beach Resort	3	5	1	9	900
8	Oriental Hotel	7	8	5	20	2000
9	Palace Hotel	8	9	8	25	2500
10	Orchard Inn	6	6	3	15	1500
11	Grande Hotel	2	5	3	10	1000
12						
13	<u>Total Bookings</u>	26	33	20	79	
14					<u>Total Income(\$)</u>	7900
15						

(a) Write down a cell that contains a label.

.....[1]

(b) Write down a formula that could be in cell **F7** to calculate the income for the hotel named Beach Resort.

.....[1]

(c) Describe how the formula in **B13** can be copied into the cells **C13**, **D13** and **E13**.

.....
.....
.....[2]

(d) State the cells that are needed to create a bar chart showing the Total Bookings for each of the hotels.

.....
.....[2]

(e) The data in row 7 to row 11 needs to be sorted into descending order of income.

(i) Describe how this sort will be done.

.....
.....[2]

(ii) Write down the Hotel names in the order that they will appear after this sort has been done.

.....[2]

7 State **three** ways that computers help the police detect crime.

1.....

2.....

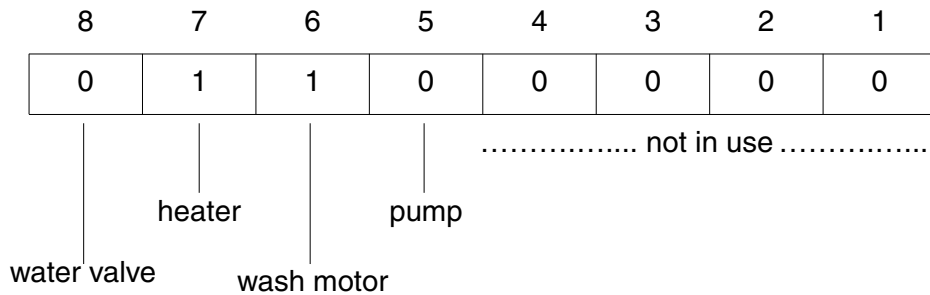
3.....

[3]

8 A microprocessor controls the washing cycle of an automatic washing machine and gives output to the following devices:

- water valve
- heater
- wash motor
- pump

Control bits are sent to turn parts of the system on or off, i.e. 1 is on and 0 is off.



(a) State what is happening when the above bit pattern is set.

.....[1]

(b) Write down the bit pattern that would be set if the water has reached the correct level, the temperature is the required temperature, the clothes have been washed and the pump is now pumping the water out of the machine.

8	7	6	5	4	3	2	1

[1]

(c) State **one** other process that the microprocessor could control.

.....[1]

9 Banks are replacing each credit card with a smart card, which contains a microchip, in order to give greater protection against fraud.

(a) State **three** items of data that are stored on the microchip in a smart card.

- 1
- 2
- 3[3]

(b) State **two** disadvantages for banks and businesses of using smart cards.

- 1
-
- 2
-[2]

(c) State **two** uses of a smart card other than as a credit card.

- 1
-
- 2
-[2]

10 A school library has purchased some multimedia notebook computers for students to connect to the Internet to search for information.

(a) State **two** advantages and **one** disadvantage of using the Internet for searching for information.

- Advantage 1
-
- Advantage 2
-
- Disadvantage
-[3]

(b) Explain why the school would have chosen Broadband instead of a standard modem connection.

.....
.....[2]

(c) The notebook computers are linked to a server by wireless connection. Give **one** benefit and **one** disadvantage of wireless connection.

Benefit

.....

Disadvantage

.....[2]

(d) State **one** suitable portable storage media for saving data and multimedia files.

.....[1]

(e) Give **two** precautions that the school must take to ensure that there is no risk to the students' health and safety from the use of computers.

1

.....

2

.....[2]

11 Computers systems can have special hardware and special software installed so that disabled students can use a computer to help them study.

(a) State **one** type of special hardware and the way it helps a disabled student.

Special hardware

Way

.....

.....

.....[2]

(b) State **one** type of special software and the way it helps a disabled student.

Special software.....

Way

.....

.....

.....[2]

12 A factory has decided to computerise its manual order processing system.

(a) State **two** items that would be included in a feasibility report that is produced when the feasibility study is complete.

1

.....

2

.....[2]

(b) State **two** fact-finding methods that would be used to obtain information about the manual order processing system.

1

.....

2

.....[2]

(c) Give **one** reason why parallel running is often chosen as the method of implementation.

.....
.....[1]

(d) State **one** item of user documentation and **one** item of technical documentation that should be provided for the new system.

User documentation
.....
Technical documentation.....
.....[2]

13 The following algorithm contains an error.

- 1. SET **X** = 1
- 2. REPEAT
- 3. **X** = **X** + 2
- 4. Print **X**
- 5. UNTIL **X** = 10

(a) Trace the algorithm and explain what the error is.

.....
.....
.....
.....
.....[2]

(b) Write an algorithm which uses a While..Do..Endwhile loop and outputs the numbers 2, 4, 6 and 8.

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....[3]

14 (a) Give **one** type of program that should be written in assembly language.

.....[1]

(b) Give **one** reason why assembly language is used.

.....
.....
.....[1]

15 State **one** application of computing where real-time processing is more appropriate than batch processing and give a reason why.

Application
.....
Reason
.....
.....[2]

16 (a) State **one** reason why hospitals have changed from a manual system to a computer-based system for storing patient records.

.....
.....[1]

(b) State the type of access that is used to retrieve a patient record.

.....[1]

(c) Give **one** situation when a patient record would be inserted and **one** situation when a patient record would be amended.

Inserted
.....
Amended
.....[2]

(d) Describe how the patient database could be restored after a system failure.

.....
.....
.....[2]

(e) State **two** tasks, other than storing patient records, that the hospital could use the computer system for.

1
.....
2
.....[2]

- 17 Using pseudocode or otherwise, write an algorithm that will input 25 marks and output the number of DISTINCTION, MERIT, PASS or FAIL grades.

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A mark greater than 69 will get a DISTINCTION, a mark between 69 and 60 (inclusive) will get a MERIT and a mark between 59 and 50 (inclusive) will get a PASS.

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[6]

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