

Candidate Name _____

Centre Number

Candidate
Number

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International General Certificate of Secondary Education

CAMBRIDGE INTERNATIONAL EXAMINATIONS

COMPUTER STUDIES

0420/1, 0421/1

PAPER 1

MAY/JUNE SESSION 2002

2 hours 30 minutes

Candidates answer on the question paper.
No additional materials are required.

TIME 2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

FOR EXAMINER'S USE

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This question paper consists of 16 printed pages.



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

(a) multimedia
.....
.....[2]

(b) array
.....
.....[2]

(c) de-skilling
.....
.....[2]

(d) expert system
.....
.....[2]

(e) verification
.....
.....[2]

2 Describe **two** ways that a scanner could be used to transfer paper-based documents to files stored on a computer.

1
.....
.....

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

- 3 (a) State **two** advantages to businesses of using electronic funds transfer (EFT).

1

.....

.....

2

.....

.....[2]

- (b) State **two** disadvantages to businesses of using EFT.

1

.....

.....

2

.....

.....[2]

- 4 (a) State **two** advantages of using a high-level language rather than a low-level language for writing programs.

1

.....

.....

2

.....

.....[2]

- (b) Explain the difference between a compiler and an interpreter.

.....

.....

.....[2]

5 A bank uses a mainframe computer.

(a) State **three** tasks done by the operating system.

- 1
-
-
- 2
-
-
- 3
-
-[3]

(b) Describe how the bank's data can be restored after systems failure.

-
-
-[2]

6 A microprocessor-controlled air-conditioning system has been installed in a museum.

- (a) (i) State a suitable input device.
- (ii) State a suitable output device.[2]

(b) Describe the feedback loop which maintains the best conditions in the museum.

-
-
-
-[2]

(c) State an advantage for the museum owners of having this system installed.

-
-[1]

7 Weather satellites transmit images as coded radio signals to a computer on earth.

(a) Give **two** ways software could be used to process these images.

1

.....

.....

2

.....

.....[2]

(b) Suggest **two** advantages of using data from satellite systems rather than data from weather stations on the ground for forecasting the weather.

1

.....

.....

2

.....

.....[2]

- 8 The following set of instructions can be used to control a robot which moves heavy boxes.

Forward n	Move forward n steps
Backward n	Move backward n steps
Right d	Turn clockwise d degrees
Left d	Turn anti-clockwise d degrees
Up n	Move the robots arms up n cm
Down n	Move the robots arms down n cm

The following set of instructions moves the robot forward 20 steps, turns the robot 90° anti-clockwise and moves the arms up 40 cm.

Forward 20

Left 90

Up 40

- (a) Write **three** more instructions so that the robot will return to its original state.

.....

[3]

- [3]

- 9 Errors can occur in data when it is being transmitted. A zero can be changed to a one and a one can be changed to a zero.

A method of checking the data is to write 1 in bit position 7 if there is an odd number of 1's in the other 7 bits, otherwise write 0 in bit position 7. For example the following bit pattern has a 1 in bit position 7 as the other bits contain an odd number of one's.

Bit position

7	6	5	4	3	2	1	0
1	0	0	1	1	1	0	0

Data

- (a) Complete the bit pattern below by writing the bit which should be in position 7.

7	6	5	4	3	2	1	0
	1	0	1	1	1	0	0

[1]

- (b) In order to give a better chance of errors being discovered, a block of data can have vertical as well as horizontal checks. Complete the table by inserting the bits that should be on the bottom row.

Bit position

7	6	5	4	3	2	1	0
1	0	1	0	0	0	0	0
1	0	0	1	1	1	0	0
1	1	1	1	1	1	1	1
0	1	0	1	0	1	0	1
0	0	0	0	1	1	0	0
0	0	0	1	0	0	0	1
			0	1	0		

[2]

- (c) Suggest a reason why a bit could have changed when the data were transmitted.

.....

.....

.....[1]

- 10 The following spreadsheet shows the results of two tests. The cells D2:D6 each contain a formula.

	A	B	C	D	E
1		TEST 1 out of 100	TEST 2 out of 100	AVG MARK	PASS
2	M DAVIES	82	68	75	YES
3	J GRIFFITHS	48	72		NO
4	S HARRISON	98	98		YES
5	M KHAN	88	62		YES
6	I PATEL	70	80		YES

- (a) Write down a **cell** which should contain

(i) a label

(ii) a number[2]

- (b) Suggest a formula that could be in D2 to calculate the average mark.

.....[1]

- (c) Describe how the formula in D2 can be copied into the range of cells D3:D6.

.....

[2]

- (d) Describe how the results for TEST 1 can be displayed in descending order.

.....

[2]

- (e) A bar chart is needed to compare the average marks for each student. Write down the range of cells needed to produce the chart.

.....

[2]

11 Part of a holiday file is shown below.

BOOKING NO	MEALS	NIGHTS	HOTEL	PRICE (\$)
BK0042	RO	7	REGENT	250
BK0043	FB	5	SAVOY	400
BK0044	HB	6	BROWNS	350
BK0046	FB	7	SEAVIEW	375
BK0048	BB	10	HILL TOP	295
BK0050	HB	7	VALLEY	475

The following codes represent the meals.

MEALS RO – room only
 BB – bed and breakfast
 HB – half board
 FB – full board

(a) Complete the table below to show the data type and field size for each field.

FIELD NAME	DATA TYPE	FIELD SIZE
BOOKING NO		
MEALS		
NIGHTS		
HOTEL		
PRICE (\$)		

[2]

(b) State **two** reasons why the MEALS data have been coded.

- 1
-
- 2
-[2]

(c) Suggest **two** more fields that could be used in this file.

- 1
- 2[2]

(d) The following search condition is input

(MEALS = "RO") OR (PRICE (\$) > 350).

(i) Write down the output using the BOOKING NO only.

.....

[2]

(ii) Write a similar search condition which will display the holidays which are more than 7 nights and cost \$450 or more.

.....[2]

(e) Describe the processing and output when a customer books a holiday.

Processing

Output

[3]

- 12** Each evening a travelling salesperson uses a laptop computer and a modem to log on to an Internet Service Provider (ISP) to read the e-mail.

(a) Explain why a modem is needed to communicate with the ISP.

.....

.....

.....

.....[2]

(b) Describe **two** ways that the ISP fileserver will check that the salesperson is an authorised user.

1

.....

2

.....[2]

(c) Describe **three** services, other than e-mail and connection to the internet, that the ISP may offer.

1

.....

2

.....

3

.....[3]

(d) Explain what the Internet is.

.....

.....

.....

.....

.....

.....[2]

- 13** A small business has decided to change from a manual wages system to a computerised wages system for producing the employees' pay.

(a) State **three** stages in the analysis of the existing system.

- 1
-
-
- 2
-
-
- 3
-
-[3]

(b) State **two** advantages for the business of writing the program instead of buying a software package.

- 1
-
-
- 2
-
-[2]

(c) State **two** types of test data that should be used to test the program.

- 1
-
-
- 2
-
-[2]

(d) State **two** items that should be included in the program's documentation.

1

.....

2

.....[2]

14 A computer is used in a hospital to monitor and control a patient's condition.

(a) State an item of data that could be input.

.....

.....[1]

(b) Describe the processing done by the computer.

.....

.....

.....

.....

.....

.....[3]

(c) State an output from the system.

.....

.....[1]

15 A doctor is planning to store patient records on a computer system.

(a) State **three** Data Protection Rules that the doctor should obey.

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

(b) Describe **two** possible effects if the doctor does not obey the Data Protection Rules.

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

- [6]