OCR
RECOGNISING ACHIEVEMENT

Wednesday 11 January 2012 – Afternoon

GCSE COMPUTING

A451/01 Computer Systems and Programming

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
None

Duration: 1 hour 30 minutes

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A451 01

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- The total number of marks for this paper is **80**.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- This document consists of **16** pages. Any blank pages are indicated.

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1 Bytes, Kilobytes and Megabytes are units used for the amount of data stored in a computer.

(a) State which of these units is most appropriate for the following items of data.

A one page text document: .....

A ten minute movie clip: .....

A person's surname: ..... **[3]**

(b) A computer has a hard disk of 2 Terabytes.

How much is this in Gigabytes?
You **must** show your working.

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

2 One of the functions of an operating system is multi-tasking.

(a) Explain **one** reason why multi-tasking is needed in an operating system.

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

(b) State **two other** functions of an operating system.

1 .....

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2 .....

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

3 A mail-order company buys dresses from America and France to sell in the UK.

The company uses the following algorithm to convert sizes before printing them in its catalogue. Half sizes are not possible (e.g. size 12.5).

```
INPUT Size
INPUT Origin
IF Origin = "America" THEN
    Size = Size + 2
ELSE
    IF Origin = "France" THEN
        Size = Size – 26
    END IF
END IF
PRINT Size
```

(a) The code uses the variables Origin and Size.

(i) Describe what is meant by a variable.

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

(ii) State the most appropriate data type for the variables Origin and Size, giving a reason for your choice.

Origin

Data type .....

Reason .....

.....

Size

Data type .....

Reason .....

..... **[4]**

(b) The company sells the following dresses.

Dress A	**Dress B**	**Dress C**
Origin: France Size: 40	Origin: America Size: 8	Origin: UK Size: 12

State the size which will be printed in the catalogue using the algorithm given.

Dress A .....

Dress B .....

Dress C ..... **[3]**

4 **(a)** The table below contains some statements about the internet.

Tick **one** box in each row to show whether each statement is true or false.

	TRUE	FALSE
The internet is the same as the World Wide Web		
The internet is a Local Area Network		
The internet is a network between many networks		

[3]

(b)* A user types the address www.ocr.org.uk into a web browser.

Describe how a DNS server is used to access this website **and** explain the advantages of using DNS servers.

The quality of written communication will be assessed in your answer to this question.

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..... **[6]**

5 Peter takes a picture of himself and his friends to put on a social networking site. The picture is converted into pixels and stored as a bitmap file.

(a) Tick **one** box in each row to show whether or not each of the following items **must** be included in the bitmap file.

	Must be included	Need **not** be included
The names of the people in the picture		
The width of the picture in pixels		
The number of bits used for each pixel		
The number of people in the picture		
The colour of each pixel		

[5]

(b) (i) What is meant by the resolution of the picture?

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

(ii) How does the resolution affect the size of the bitmap file?

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

6 Mrs Smith runs a dog sitting service that looks after dogs whose owners are going away on holiday.

Mrs Smith uses a database with two tables:

- The table DOG stores the following data about each dog: DogID, name, sex, weight, date of arrival, date of departure.
- The table JOB stores the daily jobs that she needs to do with each dog.

(a) The DOG table contains fields for the sex and weight of the dog.

(i) Describe a validation check that can be done on the sex field.

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

(ii) Describe **a differen**t validation check that can be done on the weight field.

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

An extract of the JOB table is shown below:

JobNumber	DogID	JobType	Time	Details
35	SM13	Feed	Morning	250 g of Hundex
36	BA12	Walk	Afternoon	At least 30 minutes
37	SM13	Walk	Afternoon	Keep on leash
38	GH14	Other	Morning	Medicine: 1 tablet of Depucine
39	HT19	Other	Evening	Brush fur

(b) Explain why DogID has been included in this table.

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

(c) Mrs Smith uses a query to select jobs using the following criteria:

(Time = “Afternoon”) OR (Time = “Evening”)

List the JobNumbers of the jobs that will be selected from the extract shown.

.....

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

(d) Mrs Smith wants to use database management software to create a report of all the jobs that she needs to perform on any given day, using data from the DOG and JOB tables.

In the space below, design a layout for the report.

[6]

7 A school uses a computer system to monitor the attendance, punctuality and homework of its pupils.

(a) Describe **two** ways in which modern computer technology can help the school monitor the pupils.

1. .....

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2. .....

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..... **[4]**

(b) The school has decided to use off-the-shelf software.

(i) State **two** advantages of off-the-shelf software.

1 .....

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2 .....

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

(ii) State **two disadvantages** of off-the-shelf software.

1 .....

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2 .....

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

(c)* Explain how the school might address any legal issues when creating a system which stores personal data about pupils.

The quality of written communication will be assessed in your answer to this question.

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..... **[6]**

8 Mina's computer has 4 GB of RAM.

(a) Describe the purpose of RAM in the computer.

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

(b) The computer also uses virtual memory.

(i) Explain what is meant by virtual memory.

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

(ii) State why virtual memory is needed.

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

(iii) Mina upgrades the computer to 6 GB of RAM.

Explain how this upgrade will affect the performance of the computer.

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

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TURN OVER FOR LAST QUESTION

9 The program in a vending machine uses an array called Coins to store the value in pence of all the coins that have been entered in the current sale.

A maximum of 10 coins can be entered in each sale.

After each sale, the array is reset so that all values are 0.

(a) Here is an example of the contents of the array Coins during a sale.

10	100	20	50	5	0	0	0	0	0

In the example above, the value of Coins(1) is 10.

State the value of

Coins(4) .....

Coins(10) ..... **[2]**

(b) An algorithm to reset the contents of the array Coins after each sale is shown below. This algorithm contains a logic error.

```
i = 1
REPEAT
    Coins(i) = 0
    i = i + 1
UNTIL i = 10
```

(i) State what is meant by a logic error.

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

(ii) Explain why the algorithm above contains a logic error.

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

(c) Write an algorithm to calculate the total value of the coins entered in the current sale using the contents of the array Coins.

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..... **[5]**

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