



Oxford Cambridge and RSA

Wednesday 3 June 2015 – Morning

GCSE COMPUTING

A451/01 Computer Systems and Programming



Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:

- Calculators are allowed in this exam

Duration: 1 hour 30 minutes



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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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**.
- The Quality of Written Communication is assessed in questions marked with an asterisk (*).
- This document consists of **20** pages. Any blank pages are indicated.

Answer **all** the questions.

- 1 A typical smart phone is a computer system with input, output and storage devices.



State **one** input device, **one** output device and **one** secondary storage device that are built into a smart phone.

Input device

Output device

Storage device

[3]

2 The website of a school allows visitors to download JPG, MP3, MPEG and PDF files.

(a) The table below describes the content of four files that can be downloaded from the website.

Complete the table using the file types above, identifying the **most suitable** file type for each item. You may use a file type more than once if appropriate.

Content	Type of file
An image showing a map of the school	
A text document containing information for parents about the school rules	
A high resolution picture of all the staff and pupils	
A short video clip of some pupils saying why they like the school	

[4]

(b) The video clip is compressed using lossy compression.

Explain why lossy compression is suitable for a video clip, but not suitable for a text document.

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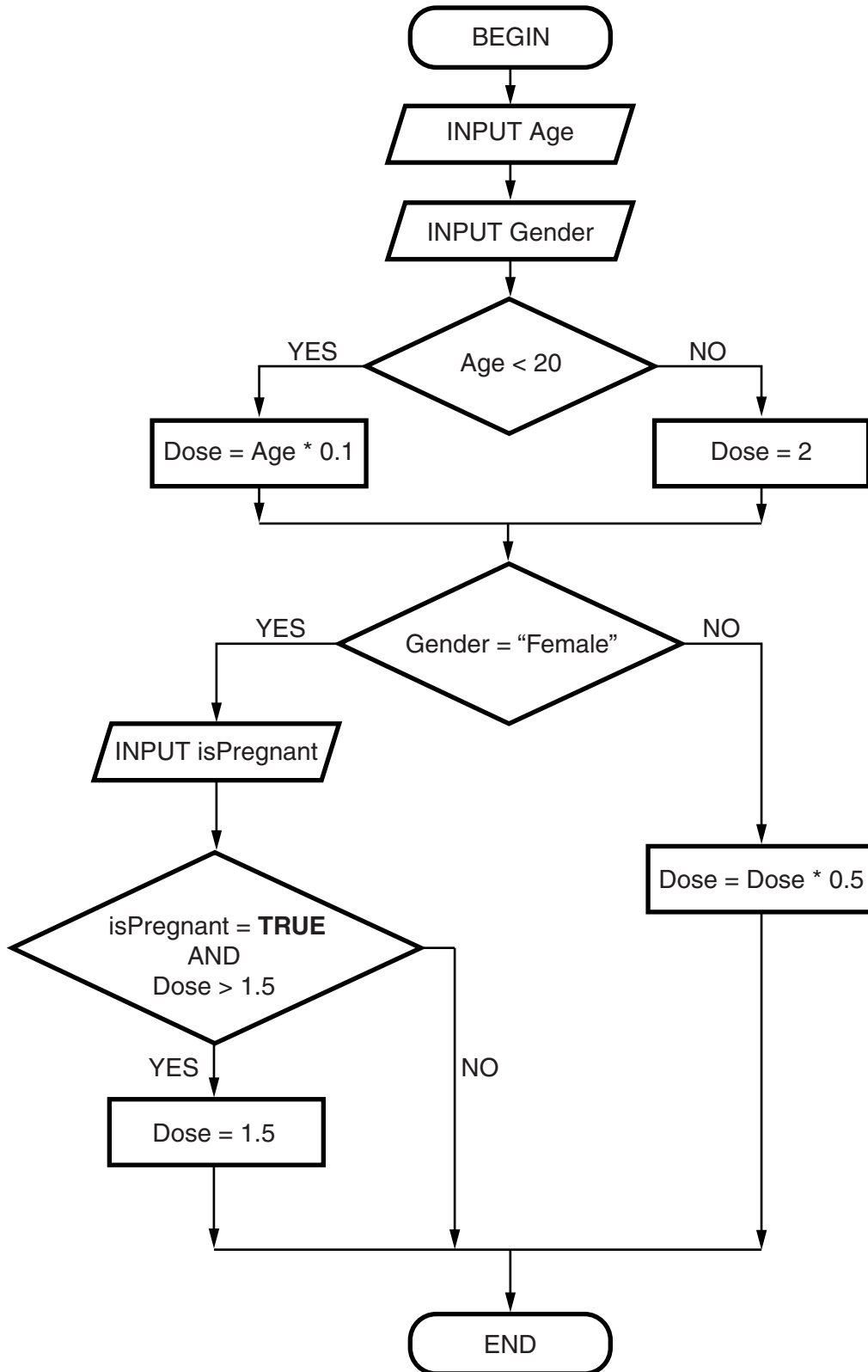
.....

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[3]

3 A computer program calculates the correct dose in grams of a type of medicine.

The algorithm used is shown by the flow diagram below.



(a) The data type of the variable Age is Integer.

State the data type of the following variables used in the flow diagram.

Variable	Data Type
Gender	
Dose	
isPregnant	

[3]

(b) Use the flow diagram to calculate the correct dose of medicine for a male aged 30.

You must show your working.

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..... [3]

(c) Use the flow diagram to calculate the correct dose of medicine for a pregnant female aged 19.
You must show your working.

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..... [4]

4 Security on a computer can be provided directly by the operating system or by using utility programs.

(a) Utility programs include antivirus, file transfer, firewall and system cleanup.

State which **two** of these utilities can be used for security.

1

2

[2]

(b) Identify and describe **two** methods by which the operating system can provide additional security directly.

1

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2

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[4]

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Question 5 begins on page 8

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5 Graeme is a freelance programmer. He has written a program for a client and gives the client both the high level code and the machine code of the program.

(a) (i) Describe what is meant by

High level code

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Machine code

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[4]

(ii) State why Graeme needs a compiler.

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[1]

6 A hairdresser uses a relational database to keep records of his clients and their appointments. The hairdresser uses off-the-shelf data-handling software to manage the database.

(a) State what is meant by off-the-shelf software.

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..... [1]

(b) Describe how the data-handling software can be used to set up the structure of the database, before any data is added.

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..... [3]

(c) State **two** tasks the hairdresser can perform using the data-handling software, once the database is in use.

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2

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..... [2]

11
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Question 7 begins on page 12

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7 Dipesh is thinking of buying a tablet computer to replace his old desktop computer.

(a) Describe how the CPU and RAM work together to enable the tablet computer to operate.

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..... [3]

(b) The tablet computer also uses cache memory.

Describe the purpose of cache memory.

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..... [2]

8 A microwave oven is controlled by a small, specially built CPU.

The table below shows some CPU instructions and what they mean.

CPU instruction	Meaning
00001000 00010100	Add 20 to the timer
00001000 00000001	Add 1 to the timer
00000100 00000001	Subtract 1 from the timer

(a) Using examples from the instructions above, state what is meant by:

(i) an opcode

.....

 [2]

(ii) an operand

.....

 [2]

The time displayed on the microwave oven is represented as two 8-bit binary numbers, one for the minutes and one for the seconds.

For example;

“8:20” is stored as 00001000 00010100

“15:45” is stored as 00001111 00101101

(b) Show how the time 5:30 will be stored.

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 [2]

- (c) 00001000 00010100 can represent either the instruction for “Add 20 to the timer” or the data for the time “8:20”.

Explain how the CPU can determine whether it represents an instruction or data.

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..... [1]

9 A bank uses a local area network to connect all the computers in its head office.

(a) State **two** ways the local area network can be used to monitor the work of employees.

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[2]

(b) Computers in the network can be identified using both IP addresses and MAC addresses.

Describe **two** differences between IP addresses and MAC addresses.

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[4]

(c) The bank network uses failover.

Describe what is meant by failover and justify the need for failover in the network.

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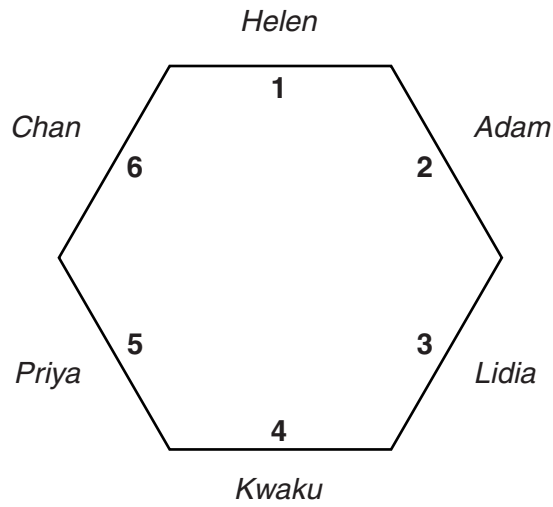
[4]

17
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Question 10 begins on page 18

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- 10 A game on a computer shows six players around a table on seats. They are numbered 1 to 6 as shown below.



The names of the players are stored in an array with six elements called `PlayerName`. The index position of the array is used to indicate the seat number. For example, the value of `PlayerName(1)` is "Helen".

- (a) State the value of `PlayerName(3)`.

..... [1]

- (b) Describe what will happen if the code for the game includes an instruction to print the value of `PlayerName(7)`.

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..... [2]

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