OCR
RECOGNISING ACHIEVEMENT

Friday 11 January 2013 – Afternoon

GCSE COMPUTING

A451/01 Computer Systems and Programming

A426260113

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
None

Duration: 1 hour 30 minutes

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**.
- The Quality of Written Communication is assessed in questions marked with an asterisk (*****).
- This document consists of **16** pages. Any blank pages are indicated.

1 **(a)** Add the following bytes.

$$\begin{array}{rcccccccc} & 1 & 1 & 0 & 1 & 1 & 0 & 0 & 0 \\ + & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ \hline \end{array}$$

[2]

(b) State the problem that will occur if a computer is to store the result as a byte.

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

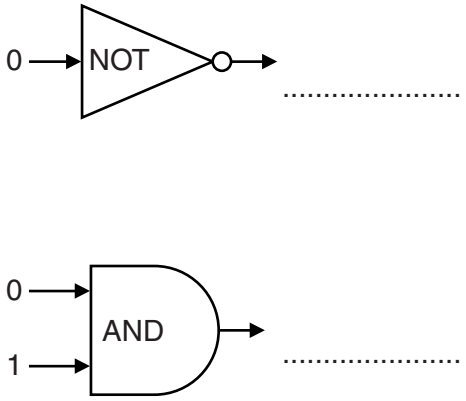
2 A website is made up of different types of files.

State what each of the file types in the table below is used for.

File type	Use
HTML	
JPG	
MP3	
PDF	

[4]

3 **(a)** State the output of each of the following logic circuits for the inputs given.



[2]

(b) Fig. 1 is a circuit diagram.

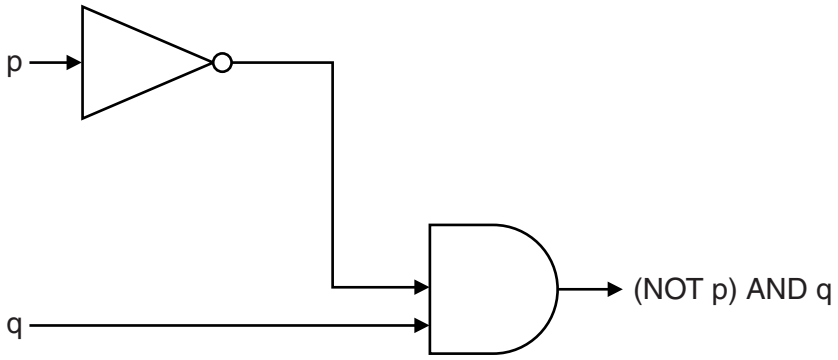


Fig. 1

Complete the truth table for Fig. 1.

p	q	(NOT p) AND q
0	0	0
1	0	0

[3]

4 Most computer systems use at least one storage device.

(a) Explain **one** reason why a secondary storage device is needed in most computer systems.

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

(b)* Some secondary storage devices are magnetic and others are solid state.

Describe the characteristics of magnetic and solid state secondary storage.

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

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

5 A school has all of its computers in a local area network (LAN).

(a) State **two** benefits of a LAN.

1 .....

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2 .....

.....

[2]

(b) Explain **two** measures which the school will need to take to ensure the security of the network.

1 .....

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2 .....

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[4]

6 When recording a sound file on a computer, the sound needs to be sampled.

(i) Describe how sampling is used when storing sound.

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

(ii) Explain the effect of the sampling interval on the size and quality of the sound file recorded.

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

7* The accident and emergency department of a hospital uses a computer system to decide the order in which patients are treated.

Describe advantages of using a computer system instead of a person to decide the order, and the need for this system to be reliable.

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

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

8 **(a)** Explain why data is stored in computers in a binary format.

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

(b) In the ASCII character set, the character codes for the first three capital letters are given below.

Letter	**ASCII character code**
A	01000001
B	01000010
C	01000011

(i) State how the ASCII character set is used to represent text in a computer.

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

(ii) Convert the word CAB into binary using the ASCII character set.

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

(iii) Explain why the ASCII character set is **not** suitable for representing text in all the languages of the world.

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

9 Charley is writing a program for music students. To make sure that there are no logic errors in the program, Charley uses a test plan.

(a) Describe what is meant by a logic error.

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

(b) The program uses the letters in the following list to represent musical notes.

C D E F G A B

When the user inputs a letter from this list, the program outputs the next three notes in the list. If it gets to the end of the list, it starts again from the beginning, so the next note after B is C.

Complete the test plan below by stating, for each input data, the expected outcome and a reason for the test.

Input Data	Expected outcome	Reason for test
C	.....	....
A	.....	....
H	.....	....

[6]

10 Amin buys a new computer with an operating system and some utilities.

(a) State **two** functions of the operating system.

1 .....

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2 .....

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[2]

(b) The table below shows some of the utilities in Amin's computer.

Tick **one** box in each row to show whether the utility is used for security or disk organisation.

Utility	**Used for security**	**Used for disk organisation**
Antivirus		
Defragmenter		
File transfer		
Firewall		

[4]

(c) Some of the software in Amin's computer is open source.

Describe what is meant by open source software.

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

11 A social networking site uses a database to store the details of the people who have joined the site.

(a) Describe what is meant by a database.

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

(b) When a person joins the website, they need to enter some personal data which is validated using rules. For example, the date of birth must be in the past.

State **one** rule that could be used when validating each of the following.

Email address

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Gender

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Password

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[3]

(c) Each user can upload several pictures. Each picture has a date and a comment.

The personal data of users is stored in a table called USER. The data about the pictures is stored in a separate table called PICTURE.

Explain why the data about the pictures should be in a separate table, and how the tables can be linked.

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

12 Jim is writing a program to calculate the wages of workers in a teddy bear factory.

(a) Jim uses an Integrated Development Environment (IDE) to create the program.

Describe **two** tools in an IDE that can help Jim when creating the program.

1 .....

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2 .....

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[4]

(b) Workers sometimes get a £50 bonus.

Here is the algorithm used to calculate whether a worker should get a bonus.

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Limit = 200
INPUT WagesEarned
IF WagesEarned < Limit THEN
    Pay = WagesEarned
ELSE
    Pay = WagesEarned + 50
END IF
```

State the value of Pay after this code is executed for each of the following values of WagesEarned.

WagesEarned = 50 Pay = ...

WagesEarned = 200 Pay = ...

[2]

(c) The wages earned by a worker is either £2 for every teddy bear they have made or £5 for every hour they have worked, whichever is larger.

Write an algorithm that:

- allows the user to input the number of teddy bears made and the number of hours worked
- calculates the wages for the number of teddy bears made
- calculates the wages for the number of hours worked
- outputs the larger of the two results.

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END OF QUESTION PAPER

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