OCR
RECOGNISING ACHIEVEMENT

GENERAL CERTIFICATE OF SECONDARY EDUCATION

COMPUTING

A451

Computer Systems and Programming

Candidates answer on the question paper.

OCR supplied materials:
None

Other materials required:
None

Monday 23 May 2011
Morning

Duration: 1 hour 30 minutes

A451

OCE/26572

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. Pencil may be used for graphs and diagrams only.
- 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).
- Answer **all** the questions.
- 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.

1 **(a)** State what is meant by a storage device, an input device and an output device in a computer system.

Storage Device:

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Input Device:

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Output Device:

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[3]

A secondary school is upgrading its computer equipment.

(b) Complete the table below to show whether magnetic, optical or solid state storage is most appropriate for each of the following uses. Give a reason for each case.
The first one has been done for you.

Use	Magnetic, optical or solid state	Reason why this is most appropriate
Storing pictures in a digital camera	solid state	Is not affected by the camera being moved around
Handheld device used by students for field work		....
Storage drives on the school's main file server		....
Videos of the school production to be given to parents		....

[6]

(c)* The secondary school wants the computer systems to be more accessible to students with disabilities.

Describe, with examples, input and output devices which are available for students with disabilities.

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

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

2 A grocery shop uses a database with a DBMS to keep records of its stock.

(a) Explain what is meant by a DBMS.

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

(b) The database uses forms and reports.

Describe each of these and give **one** example of how it would be used in the shop's database.

Form

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

Example

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

Report

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

Example

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

Here is some data from the supermarket's database.

ProductID	Description	Supplier	Quantity Left	Reorder Level	Discontinued	Price
0001	6 eggs	Hill Farm	50	20	FALSE	£0.98
0002	2 litres of milk	Hill Farm	17	20	TRUE	£1.20
0003	1kg apples	Killey's	42	50	FALSE	£0.79
0004	250g butter	Hill Farm	12	25	FALSE	£0.49
0005	500g Moku Flakes	Moku Foods	0	10	TRUE	£0.99
0006	6 salad tomatoes	Killey's	30	30	FALSE	£0.89
0007	580g can baked beans	Moku Foods	27	30	FALSE	£0.42
0008	Family tomato ketchup	Moku Foods	41	20	FALSE	£1.45

(c) The shop runs queries using logical operators to select data for different purposes.

(i) State the ProductID of the products in the above sample which fit the following criteria.

Supplier = Killey's

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Price > £1.00 OR Supplier = Hill Farm

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

(ii) Write the criteria which can be used to select all products which are not discontinued and where the QuantityLeft is lower than the ReorderLevel.

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

3 A rock band uses an internet website to advertise its music.

(a) The website uses HTML.

(i) Describe HTML.

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

(ii) Explain the importance of HTML in the creation of web pages.

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

(b) A list of file extensions for common file standards used on the internet is shown below.

JPG PDF MP3 MPEG ZIP

The rock band allows some files to be downloaded by fans.

Complete the table below to show which file format **from the list given above** may be used for each of the following files.

File	File Format
A high resolution image of the band to use as a desktop background.	
Sheet music of their songs ready to be printed in the correct format for guitar players.	
A short video extract from their latest concert tour.	
A compressed collection of 200 plain text files containing the lyrics of all their songs.	
An audio recording of a song from their album.	

[5]

(c) Some of the file formats use compression.

(i) Explain the importance of compressing files when transmitting them via the internet.

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

(ii) Describe the difference between lossy and lossless compression and give an example where each would be used.

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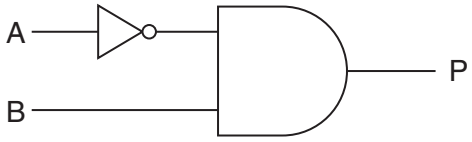
..... **[4]**

4 **(a)** The following logic circuit can be written as P = (NOT A) AND B



Complete the following truth table for the circuit given above.

A	B	P
0	0	0
0	1	
1	0	
1	1	

[3]

(b) Draw the circuit diagram which will represent the circuit P = NOT (A AND B)

[2]

5 Describe the following types of common utility programs.

(a) Antivirus

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

(b) Disk defragmenter

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

6 **(a)** Convert the hexadecimal number 6A to denary.
You must show your working.

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

(b) Convert the hexadecimal number 6A to binary.

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

(c) Convert the binary number 00111101 to hexadecimal.

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(d) Explain why hexadecimal numbers are often used to represent binary numbers.

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

7 A program contains the following code to calculate the circumference of a bicycle wheel, using the wheel size (diameter).

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BEGIN
   CONSTANT Pi = 3.14
   INPUT WheelSize
   Circumference = Pi * WheelSize
   OUTPUT Circumference
END
```

(a) The code uses one constant and two variables.

(i) State the names of the constant and the variables.

Constant: .....

Variables: .....
[2]

(ii) Explain **one** difference between a constant and a variable.

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

(b) The data type of WheelSize is integer and the data type of Circumference is real number.

Explain the difference between an integer and a real number.

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

8* A large company with 200 employees uses a local area network (LAN) which includes all the computers in its head office.

Describe the security measures and network policies which can be used to safeguard the security and privacy of the company's data on the network.

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

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9 A dog that is 5 years old is equivalent to a 42 year old human. Ashok is writing a program which converts the age of a dog to the equivalent age for a human.

The program uses the following method:

- The user inputs age of the dog in years
- If the age is 2 or less, the human equivalent is 12 times the age
- If the age is more than 2, the human equivalent is 24 for the first 2 years, plus 6 for every additional year.

Write an algorithm to calculate and output the human equivalent of the age of a dog using the method described.

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[END]

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