OCR
Oxford Cambridge and RSA

Monday 1 June 2015 – Morning

AS GCE COMPUTING

F451/01 Computer Fundamentals

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
None

Duration: 1 hour 30 minutes

* F 4 5 1 0 1 *

* 2 7 1 4 8 8 4 1 4 6 *

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 **100**, the quality of written communication will be assessed where an answer requires a piece of extended writing.
- This document consists of **16** pages. Any blank pages are indicated.

1 **(a)** The memory of a computer system contains both RAM and ROM.

(i) State **two** differences between RAM and ROM in a typical PC computer system.

1 .....

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2 .....

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[2]

(ii) State **one** item that needs to be stored in RAM and give a reason why RAM is used.

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

(iii) State **one** item of software that is stored in ROM and give a reason why ROM is necessary.

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

(b) Describe the following types of input, and give an example of when each type of input is used.

(i) OCR

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

(ii) OMR

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

2 A tank of water contains tropical fish. The water must be maintained at a constant temperature. A computer system is used to maintain the required temperature of the water.

(i) State **one** input device that will be used in the system and give its purpose.

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

(ii) State **one** output device that will be used in the system and give its purpose.

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

(iii) State a storage device that will be used with the system and identify the data that it will hold.

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

(iv) Explain the need for real-time processing in this application.

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

3 **(a)** Change the denary number 89 into the following representations.

(i) An 8 bit binary number.

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

(ii) A binary coded decimal number.

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

(iii) An octal number.

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

(b) Using the denary number 89 as an example, explain the relationship between binary and hexadecimal representations.

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

(c) (i) Change the denary number –89 into a two's complement, 8 bit binary number.

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

(ii) Change the denary number –72 into a two's complement, 8 bit binary number.

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

(d) (i) Add the two binary answers which you obtained in part **(c)** using 8 bit arithmetic.

You must show your working.

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

(ii) Explain why your answer to the addition sum is wrong.

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

4 A desktop computer uses a single user, multi-tasking, operating system.

Describe the purpose of this type of operating system.

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

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..... **[8]**

5 A processor contains a number of special registers.

Explain the need for the following registers.

(i) Program Counter (PC)

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

(ii) Memory Address Register (MAR)

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

(iii) Memory Data Register (MDR)

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

6 A systems analyst has developed a new stock control system for use in a chain of supermarkets. The system is ready to be installed.

(a) Explain **two** tasks the analyst needs to plan as part of the installation strategy.

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

2 .....

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

(b) Identify **three** types of maintenance that will be necessary after the system is running, giving an example of why each is necessary.

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[6]

7 The computers in a car showroom are connected in a network with all data being held in a central server. The computers are used by the salesmen, but can also be used by customers to watch videos of the cars that are on offer.

(a) What is meant by a protocol?

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When communicating using a network rules governing the communication are agreed, for example deciding the bit rate to be used in the communication.

(b) Describe **three** other rules that need to be agreed before communication can begin.

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[6]

(c) Many different types of data need to be communicated.

Explain, giving examples from the car showroom, the relationship between bit rates and the time sensitivity of the data being communicated.

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

8 A school has three independent computer networks.

One for student use.
One for teacher use.
One for use in the administration offices.

The three networks are going to be combined to allow data to be stored in one location. The data will be accessible at any computer if the correct access codes are used.

(a) Explain how the following devices may be used in the above situation.

(i) A bridge

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

(ii) A gateway

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(b) (i) The administration staff use form-based interfaces to send information back to the Education Authority.

Explain why a form-based interface is used.

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(ii) The network supervisor uses a command line interface.

Describe a command line interface and state why it is used.

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(iii) A type of interface needs to be chosen for use by students of all ages and abilities.

State a suitable interface to use and justify your choice.

Interface .....

Justification .....

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

9 The owner of a small shop has bought some new stock-handling software and is setting up a computer system in order to run it.

The owner will use a number of pieces of utility software.

State the purpose of each of the following types of utility software and describe how the owner would use them.

(a) File handlers

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(b) Hardware drivers

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(c) Backup utility

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10 Computers are becoming more portable and are replacing more traditional means of communication. Applications allowing social interaction are widely available.

Discuss the effects of these trends on society.

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END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE