OCR
Oxford Cambridge and RSA

Monday 6 June 2016 – Morning

AS GCE COMPUTING

F451/01 Computer Fundamentals

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 **20** pages. Any blank pages are indicated.

Turn over

1 A professional photographer, Sarah, takes and edits photographs for magazines.

Sarah carries around a digital camera and laptop to use on shoots. She keeps extra peripherals in her office that she can use when editing and finalising photographs.

(a) Name an output device Sarah may have in her office and describe what she might use it for.

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.... **[2]**

(b) The laptop has both system software and application software.

  (i) Define the term 'software'.

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.... **[1]**

  (ii) Explain why Sarah needs both system and application software.

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.... **[2]**

(c) Sarah sends digital copies of the photos to clients, by post, to be checked before they get sent to the printers.

Identify and justify a storage medium that would be suitable for sending photographs to clients.

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(d) Sarah has a program that resizes and watermarks all the photographs before they are sent out. This is performed as a batch process.

Explain why this task is suitable to be performed as a batch process.

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.... **[4]**

(e) Sarah needs a computerised system in which to catalogue her photographs.

Give **two** reasons why you would **not** recommend that Sarah has this software custom written.

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.... **[2]**

2 Asim is the head of a chess club. One of his jobs is to send out a monthly newsletter.

For the newsletter, club members send in descriptions of games they play using chess notation, which consist of a sequence of symbols, letters and numbers. It is important that these descriptions are accurate.

(a) Identify and describe **one** method of verification that members could use to help reduce the chance of an error being made.

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.... **[2]**

(b) One member sends in the description as a plain text file. The text file is saved using Unicode, an extract of which is shown below.

♙e4   ♟c5

(i) Explain what is meant by the term 'Unicode'.

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.... **[3]**

When Asim opens this file on the text editor on his computer it looks as below.

☐e4   ☐c5

(ii) Explain why the text may not be displaying correctly.

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.... **[2]**

(c) Asim decides to create a questionnaire about the newsletter to send to the club members. He then collates their responses using Optical Mark Recognition (OMR).

Describe **four** factors Asim must consider when designing the questionnaire.

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.... **[4]**

3 A coffee company has coffee shops located across the country. Each shop has its own Local Area Network (LAN). The company wants to connect the shops in a Wide Area Network (WAN).

(a) (i) Describe **two** characteristics of a LAN.

1 ....

2 ....
[2]

(ii) Describe **two** characteristics of a WAN.

1 ....

2 ....
[2]

(b) Describe **one** piece of hardware that each shop will need to connect their LAN to the company's WAN.

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.... **[2]**

The new network will enable the company to roll out a mobile phone application that allows people to place their orders before they arrive at the shop. The company is deciding whether to use a menu-driven interface or a natural language interface.

(c) Discuss the advantages and disadvantages of natural language and menu-driven interfaces, justifying which you would recommend for the coffee chain's application.

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

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.... **[8]**

4 **(a)** Express the denary value 199 as:

(i) an 8-bit binary number

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.... **[2]**

(ii) Binary Coded Decimal

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.... **[2]**

(iii) Octal

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.... **[2]**

(b) Express the denary number –43 in binary using 8-bit two's complement representation.

Show your working.

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5 A cruise liner company has to produce daily documentation for passengers. The passengers speak a number of different languages. Currently, bilingual members of the crew translate and type different versions of documentation. The company decides to automate the translation process.

The company's system analyst follows a systems lifecycle approach.

(a) The first stage is a feasibility study.

Explain the function of the feasibility study and why it is important.

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(b) The next stage involves establishing the requirements from potential users.

Describe **three** methods that could be used to gather requirements in this scenario.

Method 1 ....

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Method 2 ....

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Method 3 ....

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[6]

(c) The translation software will use a knowledge-based system.

    (i) Define what is meant by a 'knowledge-based system'.

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.... **[1]**

    (ii) One of the components of a knowledge-based system is a knowledge base.

Describe what is meant by a 'knowledge base', referring to the cruise line's translation software.

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.... **[2]**

6 A company is designing a new low-power processor to be used in a smartwatch.

(a) The processor contains a control unit.

Describe the role of the control unit in the processor.

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.... **[2]**

(b) The processor fetches data from memory location 50.

Explain how the following are used in the process:

Memory Address Register ....

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Address Bus ....

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Data Bus ....

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Memory Data Register ....

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[4]

(c) The smartwatch receives data from a mobile phone.

    (i) State the type of connection used to transfer the data.

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      ....**[1]**

    (ii) Explain why the smartwatch might use a buffer when data is received from the mobile phone.

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      ....**[2]**

(d) The smartwatch contains ROM and RAM.

    (i) State **two** ways in which ROM differs from RAM.

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      ....**[2]**

    (ii) Give an example of what the ROM on the smartwatch might hold.

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      ....**[1]**

         Turn over

7 A dance group decide they are going to use the Internet to promote their work.

(a) The dance group stream other groups' videos online.

Explain why a connection with a high bit rate is important for this task.

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.... **[3]**

(b) Describe **one** legal implication the dance group need to consider when adding soundtracks to their videos.

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.... **[2]**

(c) The dance group decide to archive some of their old footage.

Describe the purpose and process of archiving.

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.... **[4]**

(d) Online videos are often streamed using User Datagram Protocol (UDP). UDP is a logical protocol.

(i) Describe what is meant by the term 'logical protocol'.

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(ii) Explain **one** advantage of layering logical protocols separately from physical protocols.

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Turn over

8 Companies have responsibilities with regard to the welfare of their employees.

    (a) State **four** legal responsibilities companies have with regard to the data they hold about their employees.

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(b) Discuss how computers have changed the way in which people work and the impact this may have on their wellbeing.

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

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END OF QUESTION PAPER

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