OCR
RECOGNISING ACHIEVEMENT

ADVANCED SUBSIDIARY GCE

COMPUTING
Computer Fundamentals

F451

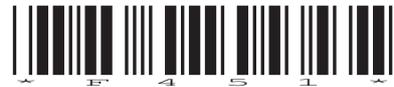Candidates answer on the question paper.

OCR supplied materials:
None

Other materials required:
None

Thursday 13 January 2011
Afternoon

Duration: 1 hour 30 minutes

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 **100**.
*   This document consists of **16** pages. Any blank pages are indicated.

OCR is an exempt Charity

Turn over

1 A student has a stand-alone computer system.

(a) Explain the difference between the hardware and the software of a computer system.

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.... **[2]**

(b) The student will use both systems software and applications software.

State the purpose of:

Systems software

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Applications software

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.... **[2]**

(c) The student stores all her school work and personal files on the computer.

(i) State why the student should back up the data stored on the computer.

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.... **[1]**

(ii) Describe a procedure that the student could follow in order to back up her files.

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.... **[3]**

2 A systems analyst has been asked to produce a piece of software for a manager in an organisation.

(a) Explain the importance of accurately defining the problem to be solved and state what each of the analyst and the manager are able to contribute to the problem definition.

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(b) When the software has been completed, its installation will need to be planned.

Describe **two** tasks which the analyst needs to plan as part of the installation strategy.

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(c) Describe how prototyping can be used by the analyst as part of the design process.

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3 A printer needs to be connected to a computer in order to receive the data that needs to be printed. If devices need to communicate they need to have a method of connection.

Describe **three** methods of connecting devices.

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.... **[6]**

4 (a) (i) 1010111011 is an unsigned binary integer.
State its denary value.

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.... **[1]**

  (ii) 1010111011 is a binary number in sign and magnitude form.
State its denary value.

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.... **[2]**

  (iii) Explain why sign and magnitude form is rarely used for computer arithmetic.

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.... **[3]**

(b) 10110010 and 00100110 are unsigned binary integers.

  (i) Add together the binary numbers. (You must show your working)

$$
\begin{array}{r}
10110010 \\
+\ 00100110 \\
\hline
 \\
\end{array}
$$

[2]

  (ii) Carry out the subtraction. (You must show your working)

$$
\begin{array}{r}
10110010 \\
-\ 00100110 \\
\hline
 \\
\end{array}
$$

[2]

5 Discuss the effects on the confidentiality of data when it is held on computer systems and steps which can be taken to protect the confidentiality of the data.

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

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.... **Turn over**................

.... **[8]**

Turn over for next question.

Turn over

6 (a) State **two** differences between a LAN (local area network) and a WAN (wide area network).

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.... **[2]**

(b) A method used to check data is to echo (use echoing back).
Explain how echoes can be used to check data transmissions.

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(c) Explain **three** differences between packet switching and circuit switching when transmitting data on a network.

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7 (a) (i) OCR is a form of data input.
Describe how OCR can be used to help partially sighted people.

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(ii) Describe the use of **two** other peripheral devices that would be particularly useful for some disabled people when using a computer.

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Turn over

(b) A sixth form student uses different forms of secondary storage media with her computer system.

For each of the following secondary storage media, state what the student may use it for. In each case identify a characteristic of the medium which makes it suitable for the use.

(i) Hard disk

Use ....

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Characteristic ....

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.... **[2]**

(ii) DVD ROM

Use ....

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Characteristic ....

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.... **[2]**

(iii) Solid state pen drive

Use ....

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Characteristic ....

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.... **[2]**

8 Part of a factory production line takes blocks of metal as input and passes them between rollers to flatten them into sheets.

(a) The process is computer controlled in order to produce sheets of the correct size and thickness.

Explain why custom-written software is used to control the process rather than generic applications software.

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.... **[2]**

(b) (i) The marketing department is responsible for advertising the products produced.

State **two** types of generic applications software that the marketing department would use and describe what they would be used for.

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.... **[4]**

(ii) The sales department stores customer records and is responsible for communications with customers.

State **two** types of generic applications software that the sales department would use and describe what they would be used for.

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.... **[4]**

(c) The entire production process, including the rolling of the sheet metal, is computerised.

The process is controlled from a central control room which is operated by a single operator.

(i) Describe the different forms of output that would be used to present information to the operator.

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(ii) Explain why the quality of the interface design is important in applications like this.

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(d) One part of the factory is the foundry. It is here that the metals are melted and then mixed in the right proportions and by the right methods to produce suitable alloys. These alloys can then be used in the factory.

A knowledge-based system (expert system) is used to provide information to ensure that the production of the alloys is successful.

Describe how a knowledge-based system is set up.

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Turn over

9 (a) Explain why the protocol used to create an interface between two devices is layered.

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(b) A network is used for sending word processed documents from one machine to another so that they can be proof read the following day. It is also used to transmit video files for viewing by all network users simultaneously as part of a training program.

Explain how these two uses influence the bit rate used across the network.

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