Candidate forename		Candidate surname	

Centre number						Candidate number				

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

ADVANCED SUBSIDIARY GCE

F451

COMPUTING

Computer Fundamentals

THURSDAY 13 JANUARY 2011: Afternoon
DURATION: 1 hour 30 minutes

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the question paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

None

READ INSTRUCTIONS OVERLEAF

DC (NF) 11MEP01247 41299

INSTRUCTIONS TO CANDIDATES

- **Write your name, centre number and candidate number in the boxes on the first page. 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.**

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.**

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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

_____

_____

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.

_____

_____ **[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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_____ **[4]**

(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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_____ **[2]**

2 _____

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_____ [2]

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

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_____ [4]

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]**

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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.

_____

_____

_____ **[2]**

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

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_____

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_____ **[3]**

(b) 10110010 and 00100110 are unsigned binary integers.

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

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  10110010
+ 00100110
----------
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[2]

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

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  10110010
- 00100110
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[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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_____ **[8]**

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

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2 _____

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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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_____ **[3]**

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

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_____ **[6]**

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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_____ **[2]**

(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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2 _____

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_____ **[4]**

(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 _____

_____

Characteristic _____

_____

_____ **[2]**

(ii) DVD ROM

Use _____

_____

Characteristic _____

_____

_____ **[2]**

(iii) Solid state pen drive

Use _____

_____

Characteristic _____

_____

_____ **[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.

1 _____

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2 _____

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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.

1 _____

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2 _____

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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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_____ **[6]**

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

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_____ **[6]**

(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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_____ **[4]**

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

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_____ **[3]**

(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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_____ **[4]**

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