OCR
RECOGNISING ACHIEVEMENT

ADVANCED SUBSIDIARY GCE

COMPUTING
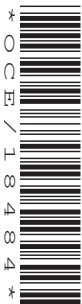Computer Fundamentals

F451

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- 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).

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.

Turn over

1 A small store currently has two exits for customers. Each exit has a computerised checkout.

   (a) Describe the purpose of the following devices that would be used at the checkouts and in each case give an example.

   (i) Input device

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   .... **[2]**

   (ii) Output device

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   .... **[2]**

   (iii) Storage device

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   .... **[2]**

   (b) The checkouts will each use systems software and applications packages.

   State the function of each of:

   (i) Systems software

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   ....

   (ii) Applications packages

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   .... **[2]**

(c) It is decided to put in a central storage facility and to link this with the two checkouts using a LAN.

(i) Describe what is meant by a LAN.

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.... **[2]**

(ii) State, giving a reason, an extra piece of hardware necessary to connect the LAN to the internet.

Hardware ....

Reason ....

.... **[2]**

(d) When data is sent from central storage to one of the checkout computers, it can suffer from corruption.

(i) One error detection method is called a check sum. This involves adding bytes together.

Add the following bytes, showing your working.

$$01011101$$
$$+ \; \underline{01001110}$$

$$\overline{}$$

[3]

(ii) Another error checking method is to use parity.
One of the following bytes has been corrupted in transmission.

00010010   01011101   10101001   11000011

State which the corrupt byte is and explain why it is corrupt.

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.... **[3]**

Turn over

2 Describe four purposes of operating systems.

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.... **[8]**

3 (a) State **two** differences between ROM and RAM.

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.... **[2]**

(b) A disk recorder for digital TV signals is controlled by an embedded processor.

(i) Explain why the control software is stored on ROM.

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.... **[2]**

(ii) Explain why it will be necessary to have some RAM.

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.... **[2]**

4 (a) Explain why a systems analyst needs to identify the information requirements of a system, **and** describe the different methods of fact finding that may be used.
(The quality of written communication will be assessed in your answer to this question.)

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.... **[8]**

(b) State **three** items of content in each of:

(i) the requirements specification of a system

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.... **[3]**

(ii) the design specification of a system.

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.... **[3]**

Turn over for next question.

Turn over

5 (a) Change the denary number 93 into

    (i) a binary number in an 8 bit byte

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.... **[2]**

    (ii) an octal number

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.... **[2]**

    (iii) Explain the relationship between the binary and octal representations of a value.

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.... **[2]**

(b) (i) Using an 8 bit byte change –60 into a two's complement binary number

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.... **[2]**

(ii) Using 8 bit bytes describe how two's complement can be used by a computer to calculate the answer to 93 – 51.

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.... **[4]**

Turn over for next question.

6 Data can be passed from one device to another using a protocol.
A protocol consists of both logical and physical parts.

(a) (i) Describe what is meant by a protocol.

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.... **[2]**

(ii) Explain how communication links are established between devices **and** state why this is necessary.

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.... **[3]**

(b) (i) Describe the logical parts of a protocol.

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.... **[3]**

(ii) Describe the physical parts of a protocol.

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.... **[3]**

(c) A major use of data transmission is in communicating with other sources over the internet. Use of the internet can affect the privacy and confidentiality of data held in a computer system.

Describe **three** steps which can be taken to protect data held in a computer system.

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.... **[6]**

Turn over for next question.

7 For each of the following user interfaces, give an example of an application of its use, the hardware which would be used with the interface in your application and describe why it is suitable for the application.

   (i) Menu based interface.

   Application ....

   ....

   Hardware ....

   ....

   Suitability ....

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   .... **[4]**

   (ii) Natural language interface.

   Application ....

   ....

   Hardware ....

   ....

   Suitability ....

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   .... **[4]**

8 Questions on an examination paper each have four possible answers, labelled A, B, C, D.

Explain why optical mark reading (OMR) is a sensible way of marking candidates' papers and describe how the marking is done.

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.... **[5]**

Turn over for next question.

9 A computer programmer works from home four days a week, for a large software house.
On Fridays she goes into the offices of the company in order to deliver any sensitive material personally and to meet with the rest of her team of programmers.

(a) Describe **two** different types of secondary storage she would use, making it clear how she would use them.

1 ....

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2 ....

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.... **[6]**

(b) The programmer used to go to the office every day and work there.

State an advantage and a disadvantage of working from home for each of:

(i) The programmer.

Advantage ....

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Disadvantage ....

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(ii) The software house.

Advantage ....

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Disadvantage ....

....

(iii) Society.

Advantage ....

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Disadvantage ....

.... **[6]**

PLEASE DO NOT WRITE ON THIS PAGE