OCR
RECOGNISING ACHIEVEMENT

ADVANCED SUBSIDIARY GCE

COMPUTING
Computer Fundamentals

F451

Candidates answer on the question paper

OCR Supplied Materials:
None

Other Materials Required:
None

**Friday 15 May 2009
Morning**

Duration: 1 hour 30 minutes

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, however additional paper may be used if necessary.

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 **12** pages. Any blank pages are indicated.

1 **(a)** State what is meant by each of the following:

(i) An input device

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.... **[1]**

(ii) An output device

....

.... **[1]**

(b) A supermarket checkout terminal has both input and output devices.
State **two** input devices and **two** output devices which would be used at the checkout. In each case state why they would be used.

Input device 1 ....

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....

.... **[2]**

Input device 2 ....

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.... **[2]**

Output device 1 ....

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.... **[2]**

Output device 2 ....

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.... **[2]**

(c) Many customers carry a store loyalty card which is scanned at the checkout.
The data collected is stored in the knowledge-base of a knowledge based (expert) system.
State **three** other parts which will make up the knowledge based system and say why each part is necessary.

Part 1 ....

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.... **[2]**

Part 2 ....

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.... **[2]**

Part 3 ....

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.... **[2]**

2 (a) Describe **two** types of bus used for sending transmissions around a processor.

Type 1 ....

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....

....

Type 2 ....

....

....

.... **[4]**

(b) When data is transmitted from one location to another, different types of data transmission can be used.

(i) Describe the difference between serial and parallel data transmission.

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.... **[2]**

(ii) Describe the difference between half duplex and duplex data transmission.

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.... **[2]**

(c) Explain the differences between using packet switching and circuit switching to transmit a message.

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.... **[3]**

(d) The internet has had a major effect on society.
Discuss the social and ethical effects on young people of allowing unrestricted access to the internet.

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

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.... **[8]**

Turn over

3   Describe each of the following, stating a suitable use for each.

   (i) MICR ....

   ....

   ....

   .... **[2]**

   Use ....

   .... **[1]**

   (ii) OCR ....

   ....

   ....

   .... **[2]**

   Use ....

   .... **[1]**

   (iii) OMR ....

   ....

   ....

   .... **[2]**

   Use ....

   .... **[1]**

4 A systems analyst is employed to investigate the introduction of a new computer system to an organisation by carrying out a feasibility study.

(a) Describe **three** factors which the analyst should consider about the proposed system.

Factor 1 ....

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.... **[2]**

Factor 2 ....

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....

.... **[2]**

Factor 3 ....

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....

.... **[2]**

(b) The analyst decides to use the spiral model of the systems life cycle.
Describe the spiral model.

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.... **[2]**

5 The thickness of sheets of glass produced by a manufacturing process is controlled by a computer which can adjust the distance apart of two rollers between which the glass is rolled. The thickness of the glass coming out from between the rollers is continually monitored by taking readings from sensors arranged above and below the glass.

(a) State what is meant by an actuator and how one would be used in this example.

Actuator ....

....

Use ....

.... **[2]**

(b) (i) The glass is, nominally, 5 mm thick. The sensors measure the thickness and return the readings to the computer.
Explain why the processor is **not** set to maintain the thickness at exactly 5 mm.

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.... **[2]**

(ii) State a sensible range between which the computer attempts to keep the thickness of the glass.

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.... **[1]**

(c) Describe how the computer controls the thickness during the rolling process.

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.... **[5]**

(d) The operator of the machine can alter the thickness from 5 mm, by inputting a different value to the computer. When the operator inputs new values it is important that the input is verified. Describe how the input can be verified in this example.

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....**[2]**

6 (a) Express the decimal number 95

  (i) in binary in a single 8-bit byte

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....**[2]**

  (ii) in binary coded decimal in a single 8-bit byte

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....**[2]**

  (iii) as a hexadecimal number

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....**[2]**

(b) Using your answers to part **(a)**, explain how binary representation of numbers can be used to determine the hexadecimal value.

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....**[3]**

7 A manufacturing company uses computers for both the manufacturing process and the tasks carried out in the offices.

(a) The computerised manufacturing process is controlled by a single operator.
State **three** factors which should have been considered when designing the output interface for the operator. Give a reason for each.

Factor 1 ....

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.... **[2]**

Factor 2 ....

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.... **[2]**

Factor 3 ....

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.... **[2]**

(b) The customer and order files used in the office are regularly backed up, while the data produced during operation of the manufacturing process is archived.

(i) Describe what is meant by backing up files, giving a reason why the customer and order files are backed up.

Backing up ....

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.... **[2]**

Reason ....

.... **[1]**

(ii) Describe what is meant by archiving data, giving a reason why the data from the manufacturing process is archived.

Archiving ....

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.... **[2]**

Reason ....

.... **[1]**

(c) The workers are paid weekly. Their times at work over the week are collected and the staff file is updated at the same time as the pay is calculated.
Describe a backing up routine which could be used for the staff file.

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.... **[4]**

8 (a) Describe the characteristics of Local Area and Wide Area Networks (LANs and WANs).

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.... **[3]**

TURN OVER FOR QUESTION 8(b)

(b) Errors may occur during data transmission. Two methods of checking for these errors are check sums and parity checks.

(i) Explain how a check sum is used to check transmitted data for errors.

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.... **[4]**

(ii) Parity bits can be used to check for errors in transmission and may also be used to check and self-correct data in blocks.
Explain how parity checks of data blocks can sometimes be used to correct transmission errors automatically.

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.... **[4]**