OCR
RECOGNISING ACHIEVEMENT

# Monday 3 June 2013 – Afternoon

## AS GCE COMPUTING

**F451/01** Computer Fundamentals

Candidates answer on the Question Paper.

**OCR supplied materials:**
None

**Other materials required:**
None

**Duration:** 1 hour 30 minutes

* F 4 5 1 0 1 *

* F 4 2 9 9 8 0 6 1 3 *

| Candidate forename | | Candidate surname | |
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| Centre number | | | | | | Candidate number | | | | |
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**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**, of which marks are allocated to the assessment of the quality of written communication where an answer requires a piece of extended writing.
- This document consists of **16** pages. Any blank pages are indicated.

**1** A company employs a large number of people. A computer system is used to produce the payroll for the employees and also to answer queries from employees when they come into the payroll office during the week.

**(a) (i)** State **one** input device which would be used on this system and why it would be used.

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..... **[2]**

**(ii)** State **one** output device which would be used on this system and why it would be used.

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**(iii)** State a storage device which would be used on this system and why it would be used.

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..... **[2]**

**(b) (i)** Explain the difference between a batch operating system and a real-time operating system.

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..... **[2]**

**(ii)** Give **one** example of a batch process from this payroll system giving a reason why it needs to be a batch process.

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**(iii)** Give **one** example of a real-time process from this payroll system giving a reason why it needs to be a real-time process.

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..... **[2]**

**(c)** The company maintains a SALES file with details of all its sales and a CUSTOMER file with details of all customers who have accounts.

The company has been advised that they should take backups and archives of the data in the files.

**(i)** Explain what is meant by an archive of a file and why it is necessary.

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**(ii)** Describe an efficient backup routine for SALES explaining your choices.

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..... **[6]**

**(d)** Some customers are concerned about giving their details to be stored on the computer system.

Explain how the measures of the Data Protection Act are designed to protect the privacy of data.

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**(e)** Generic applications software is used throughout the different departments in the company.

**(i)** State **two** types of generic applications software that would be used by the sales department and say what each would be used for.

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**[4]**

**(ii)** State **two** types of generic applications software that would be used by the accounts department and say what each would be used for.

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**[4]**

**2** **(a)** Express the following denary numbers as sign and magnitude binary numbers using an 8 bit byte.

**(i)** +35

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..... **[1]**

**(ii)** –37

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..... **[1]**

**(b)** **(i)** Add together the two answers obtained in part **(a)**.

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..... **[1]**

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

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**(c)** **(i)** Explain what is meant by the character set of a computer.

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**(ii)** Describe what is meant by UNICODE.

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**3** **(a)** A computer system uses echoing to detect when errors have occurred during data transmission.

Describe how a set of data that has been transmitted from one device to another can be checked for errors using echoing.

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**(b)** Another computer system uses parity to check the data that has been transmitted.

The following block of data has been transmitted.

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1 0 0 1 0 0 1 1
0 1 0 1 0 0 1 1
0 1 1 0 1 1 0 0
1 0 1 0 0 1 0 0
1 0 1 0 0 1 0 1
0 1 0 1 0 1 0 1
1 0 1 0 1 0 1 0
---------------
0 1 0 1 0 1 1 0      Parity byte
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**(i)** One bit has been wrongly transmitted.

Circle the single bit that has been wrongly transmitted. **[1]**

**(ii)** Explain how you worked out your answer to **(i)**.

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**(iii)** Describe how this method of checking for errors can state that there are no errors in a block when in fact there are.

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**4** A systems analyst has been employed to produce a new computer system for an organisation. The analyst decides to follow the stages of the systems life cycle.

**(a)** Describe how the waterfall model of the systems life cycle would be useful for the analyst in producing the system.

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**(b)** The analyst must produce a design specification for the new system.

Explain the design stage of the systems life cycle, including the use of prototyping, that the analyst will be expected to use during the design.

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

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**Turn over for next question**

**5** Describe the purpose of each of the following parts of a computer.

**(i)** Memory unit

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**(ii)** ALU

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**6** **(a)** Describe the following types of data transmission.

**(i)** simplex

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..... **[1]**

**(ii)** half duplex

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..... **[1]**

**(iii)** serial

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..... **[1]**

**(iv)** parallel

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..... **[1]**

**(b)** When two devices are to communicate with each other the data transmissions must be sent from one device to the other through a communications medium.

Describe **three** media used to connect devices so that data can be transmitted.

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**[6]**

**7** **(a)** Describe what is meant by

**(i)** an interrupt

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..... **[2]**

**(ii)** a buffer.

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**(b)** A computer system includes a printer.

**(i)** Explain the role of the printer buffer in the transfer of a job from the computer to the printer.

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**(ii)** Explain why an interrupt is necessary during the transfer of data from the computer to the printer.

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**8** A student owns a computer which he uses for:

- producing project work in hard copy form
- playing games with friends on the internet
- downloading video and music files.

He uses a number of pieces of utility software.

State the purpose of each of the following types of utility software and describe how the student would use them.

**(i)** Compression software

Purpose .....

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Use .....

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..... **[3]**

**(ii)** Anti-virus software

Purpose .....

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Use .....

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..... **[3]**

**(iii)** Backup utility

Purpose .....

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Use .....

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..... **[3]**

**PLEASE DO NOT WRITE ON THIS PAGE**