

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS  
AS GCE**

**F451/01**

**COMPUTING**

**Computer Fundamentals**

**MONDAY 3 JUNE 2013: Afternoon**

**DURATION: 1 hour 30 minutes  
plus your additional time allowance**

**MODIFIED ENLARGED**

<b>Candidate forename</b>		<b>Candidate surname</b>	
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<b>Centre number</b>						<b>Candidate number</b>				
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**Candidates answer on the Question Paper.**

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

**None**

**READ INSTRUCTIONS OVERLEAF**

## **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. 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).**

## **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.**
- **Any blank pages are indicated.**

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**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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**[2]**

- (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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**[2]**

- (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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**[3]**

[illegible]

- (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.**

[illegible]



**(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.**

**1** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**2** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**[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.

1 \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

[4]

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

**(i) +35**

\_\_\_\_\_  
\_\_\_\_\_ **[1]**

**(ii) -37**

\_\_\_\_\_  
\_\_\_\_\_ **[1]**

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

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ **[1]**

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

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**[3]**

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

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**[2]**

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

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**[2]**

- 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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[3]

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

The following block of data has been transmitted.

```
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
```

- (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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**[3]**

**(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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**[2]**

**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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**[2]**

**(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.**

**[8]**

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[illegible]



**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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**[3]**

**(ii) ALU**

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**[3]**

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

**(i) simplex**

\_\_\_\_\_  
\_\_\_\_\_ **[1]**

**(ii) half duplex**

\_\_\_\_\_  
\_\_\_\_\_ **[1]**

**(iii) serial**

\_\_\_\_\_  
\_\_\_\_\_ **[1]**

**(iv) parallel**

\_\_\_\_\_  
\_\_\_\_\_ **[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.**

**1** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**2** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**3** \_\_\_\_\_

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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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**[2]**

**(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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[3]

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

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[3]

**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** \_\_\_\_\_

\_\_\_\_\_

**Use** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ **[3]**

**(ii) Anti-virus software**

**Purpose** \_\_\_\_\_

\_\_\_\_\_

**Use** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ **[3]**

**(iii) Backup utility**

**Purpose** \_\_\_\_\_

\_\_\_\_\_

**Use** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ **[3]**

**END OF QUESTION PAPER**



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