

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**  
**Advanced Subsidiary GCE**

**COMPUTING**

**2506**

Introductory Computer Systems, Communications and Software

Thursday

**9 JUNE 2005**

Afternoon

1 hour 30 minutes

Candidate Name	Centre Number	Candidate Number										
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; border: 1px solid black; height: 20px;"></td> <td style="width: 15%; border: 1px solid black; height: 20px;"></td> <td style="width: 15%; border: 1px solid black; height: 20px;"></td> <td style="width: 15%; border: 1px solid black; height: 20px;"></td> <td style="width: 15%; border: 1px solid black; height: 20px;"></td> </tr> </table>						<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; border: 1px solid black; height: 20px;"></td> <td style="width: 15%; border: 1px solid black; height: 20px;"></td> <td style="width: 15%; border: 1px solid black; height: 20px;"></td> <td style="width: 15%; border: 1px solid black; height: 20px;"></td> <td style="width: 15%; border: 1px solid black; height: 20px;"></td> </tr> </table>					

**TIME** 1 hour 30 minutes

**INSTRUCTIONS TO CANDIDATES**

- Write your name in the space above.
- Write your centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- If you run out of space for an answer, continue on the spare pages at the back of the booklet.
- If you use these spare pages, you must write the question number next to your answer. You can also use the spare pages for rough work.

**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 90 (86 + 4 for the quality of written communication).
- You will be awarded marks for the quality of written communication where an answer requires a piece of extended writing.
- No marks will be awarded for using brand names of software packages or hardware.

<b>FOR EXAMINER'S USE</b>	
<b>1</b>	
<b>2</b>	
<b>3</b>	
<b>4</b>	
<b>5</b>	
<b>6</b>	
<b>7</b>	
<b>8</b>	
<b>9</b>	
<b>10</b>	
<b>11</b>	
<b>12</b>	
<b>WC</b>	
<b>TOTAL</b>	

---

**This question paper consists of 12 printed pages, 3 lined pages and 1 blank page.**

Answer **all** questions.

1 (a) State the meaning of the terms

(i) systems software .....  
.....[1]

(ii) common applications software .....  
.....[1]

(iii) utility software .....  
.....[1]

(iv) user interface .....  
.....[1]

(b) State why it is necessary to translate a program written in a high level language before it is run on a computer.

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

2 (a) State **two** differences between a LAN and a WAN.

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

(b) Give an example of a situation in which it would be appropriate to use a

LAN .....  
.....[1]

WAN .....  
.....[1]

(c) One advantage of using a network is that users can share printers.

Apart from cost, give **one** advantage and **one** disadvantage of sharing printers on a network.

Advantage .....  
.....[1]

Disadvantage .....  
.....[1]

3 Most personal computers (PCs) run operating systems that use a graphical user interface (GUI).

(a) Name and describe **three** features of an on-screen interface that would be available on a GUI.

Feature 1 .....

Description .....

.....

Feature 2 .....

Description .....

.....

Feature 3 .....

Description .....

.....[6]

(b) Explain why a typical PC operating system is described as multi-tasking.

.....

.....

.....

.....[2]

- 4 A shopping centre has a multi-screen cinema. There are several kiosks in the centre where customers can buy tickets to see films.

The ticketing system is computerised with the operator of each kiosk having a computer with keyboard, mouse and monitor.

- (a) Explain why the computers should be networked.

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

- (b) List **four** extra items of hardware which would be included in the system, giving a reason for each item that you include.

Item 1 .....[1]

Reason.....  
 .....[1]

Item 2 .....[1]

Reason.....  
 .....[1]

Item 3 .....[1]

Reason.....  
 .....[1]

Item 4 .....[1]

Reason.....  
 .....[1]

5 (a) When data is sent from one place to another, the transmission can be of different types. Explain what is meant by the following terms.

(i) Serial transmission of data .....  
.....  
.....[1]

(ii) Parallel transmission of data.....  
.....  
.....[1]

(iii) Simplex mode of data transmission.....  
.....  
.....[1]

(iv) Duplex mode of data transmission .....  
.....  
.....  
.....[2]

**(b)** Errors can occur in data when it is being transmitted.

**(i)** Describe how a parity check can be used to identify bytes containing errors.

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

**(ii)** The following bytes have been received by a device

01101101    01011010    00101010    11100011

Three of the bytes have been received without error while one is incorrect. Ring the incorrect byte and explain how the incorrect byte is identified in this case.

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

- 6 (a) State **two** differences between random access memory (RAM) and read only memory (ROM) in a personal computer (PC).

Difference 1 .....  
.....  
.....[1]

Difference 2 .....  
.....  
.....[1]

- (b) A personal computer system has a hard disk drive and a recordable DVD drive.  
Give **two** uses of each of these devices.

Hard disk

Use 1 .....  
.....  
Use 2 .....  
.....[2]

Recordable DVD

Use 1 .....  
.....  
Use 2 .....  
.....[2]



7 Name and describe the purpose of **three** individual parts of a processor.

Part 1 .....[1]

Purpose .....

.....[1]

Part 2 .....[1]

Purpose .....

.....[1]

Part 3 .....[1]

Purpose .....

.....[1]

8 (a) Express the denary number 124 as:

(i) an eight-bit binary number .....

.....

.....[1]

(ii) a number in binary coded decimal (BCD).....

.....

.....[2]

(iii) an octal number .....

.....

.....[2]

(iv) a hexadecimal number .....

.....

.....[2]

(b) Using your answers from part (a), describe the relationship between a number in binary form and its equivalent octal form.

.....

.....

.....

.....[2]

9 (a) (i) State what is meant by the character set of a computer system.

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

(ii) Explain how codes are used to represent a character set in a computer system.

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

(b) A set of student records is numbered from 1 to 1000. A program is written which allows the operator to input the name of a student whose record is required. The program then uses a loop to search through all the records in numerical order and compare the student name to the required student, reporting when the required student is found.

Explain the meaning of the following data types and for each state a use to which it can be put in the above example.

(i) Integer.....[1]

Use in example .....[1]

(ii) Boolean.....[1]

Use in example .....[1]

10 A business maintains a customer file.

A hashing algorithm is used to access records in the file. The algorithm is to

- Take the first two digits in the ID number.
- Take the last two digits in the ID number.
- Add the two pairs of digits together.
- Multiply the answer by the third digit in the ID number.

(a) Use the hashing algorithm to work out the addresses for these ID numbers

(i) 01314.....  
 .....[1]

(ii) 21212.....  
 .....[1]

(iii) 04505.....  
 .....[1]

(b) (i) State a problem which has occurred.

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

(ii) Describe **one** method of dealing with the problem identified in (i) when storing data, without altering the algorithm.

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

11 Name and describe **two** techniques which can be used when writing a program in a high level language to help with program maintenance.

Technique 1 .....

Description.....

.....

.....

.....[3]

Technique 2 .....

Description.....

.....

.....

.....[3]

12 Describe how a multi-user time sharing system works.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[6]

[Total: 86]

A series of horizontal dotted lines spanning the width of the page, intended for writing or marking.

A series of horizontal dotted lines for writing.

A series of horizontal dotted lines for writing.

---

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (OCR) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

OCR is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.