OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced Subsidiary GCE

COMPUTING

2506

Introductory Computer Systems, Communications
and Software

| Friday | **13 JANUARY 2006** | Afternoon | 1 hour 30 minutes |

Candidate
Name

Centre
Number

Candidate
Number

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.
*   Do not write in the bar code. Do not write in the grey area between the pages.
*   **DO NOT** WRITE IN THE AREA **OUTSIDE** THE BOX BORDERING EACH PAGE. ANY WRITING IN THIS AREA WILL NOT BE MARKED.

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.

FOR EXAMINER'S USE		
Question no.	Max. mark	Mark
1	6	
2	10	
3	8	
4	10	
5	10	
6	9	
7	8	
8	9	
9	6	
10	10	
WC	4	
TOTAL	90	

This question paper consists of 11 printed pages, 3 lined pages and 2 blank pages.

[Turn over

Answer **all** questions.

1 **(a)** State the **purpose** of an input device and an output device in a computer system.

Input device ....

....[1]

Output device ....

....[1]

(b) A supermarket checkout is computerised.
State **one** input device and **one** output device which would be used at the checkout, and give the use of each.

Input device ....

Use ....

....[2]

Output device ....

Use ....

....[2]

2 A school is to re-equip a computer room. The teacher has to decide between buying a suite of stand-alone computers or a network of computers.

(a) Give **three** advantages and **one** disadvantage of having a network of computers instead of stand-alone computers.

Advantage 1 ....

....

Advantage 2 ....

....

Advantage 3 ....

....

Disadvantage ....

....[4]

(b) It is decided to buy a network of computers. The network could be either a bus network or a star network.
Describe (in words or by using a diagram) each of these topologies and give an advantage for each.

Bus network

....

....

....

....

....

....

....

....

Advantage ....

....[3]

Star network

....

....

....

....

....

....

....

....

Advantage ....

....[3]

[Turn over

3 **(a)** State what is meant by the following terms:

   (i) object code ....

   ....[1]

   (ii) source code. ....

   ....[1]

(b) Explain why a translator program is necessary when a program written in a high level language is to be run on a computer.

   ....

   ....

   ....

   ....[2]

(c) When a program is written it may contain errors.
   Describe what is meant by each of the following types of error, giving an example of each.

   (i) Syntax error ....

   ....[1]

   Example ....

   ....[1]

   (ii) Logic error ....

   ....[1]

   Example ....

   ....[1]

4 **(a)** A computer game is played in real-time and on-line.
State what is meant by these terms and why they are necessary for playing the game.

(i) Real-time ....

....

....

....[2]

(ii) On-line ....

....

....

....[2]

(b) **(i)** State **four** characteristics of batch processing.

1 ....

....

2 ....

....

3 ....

....

4 ....

....[4]

(ii) Give an example of an application which uses batch processing, justifying your choice.

Example ....

....

Justification ....

....[2]

5 A secretary of a swimming club keeps a file of information about the members of the club. The club has 1000 members. The information held is shown in the table.

Field	Data type	Estimated size (in bytes)
Member surname	....	....
Date of birth	....	....
Time in seconds for 100 metres	....	....
Whether in team	....	....

(a) (i) Complete the table to show data types and sizes for each of the fields. [5]

(ii) Estimate the size of the file, giving your answer in appropriate units.

....

....

....

....[3]

(b) The secretary needs to make a backup copy of the data in case of system failure on the computer.
State a suitable medium for the backup, giving a reason for your answer.

Medium ....

Reason ....

....

....[2]

6 (a) (i) Explain what is meant by *top down design*.

....

....

....

....[2]

(ii) State what is meant by a *procedure*.

....

....[1]

(iii) Explain why procedures are useful when writing a program using top down design.

....

....

....

....[2]

(b) After a program has been written it will need to be maintained.
Describe **two** methods, other than providing a technical manual, that the original programmer can use to make the code more understandable.

Method 1 ....

....

....

....[2]

Method 2 ....

....

....

....[2]

[Turn over

7 **(a)** **(i)** Add together the binary numbers 00110110 and 01110101.

....

....

....

....[2]

(ii) Work out the binary subtraction sum 10111000 – 01100010.

....

....

....

....[2]

(b) Change the following binary values into their decimal equivalents:

(i) 10110110 (held as an 8 bit, sign and magnitude binary number)

....

....

....

....[2]

(ii) 10110110 (held as an 8 bit, two's complement binary number)

....

....

....

....[2]

8 Explain the purpose of the following pieces of utility software.

   (i) Compression software ....

   ....

   ....

   ....

   ....

   ....[3]

   (ii) File handling utilities ....

   ....

   ....

   ....

   ....

   ....[3]

   (iii) Error checking software ....

   ....

   ....

   ....

   ....[3]

9 Describe the purpose of each of the following parts of a processor.

(i) Control unit ....

....

....

....[2]

(ii) Memory unit ....

....

....

....[2]

(iii) Arithmetic logic unit ....

....

....

....[2]

10 (a) State **three** factors that need to be considered when initialising an array.

1. ....

....

2. ....

....

3. ....

....[3]

(b) Describe how to perform a serial search on an array for a specific value.

....

....

....

....

....

....

....

....

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....

....

....   [7]

If you use these lined pages to complete the answer to any question, the question number **must** be clearly shown.

15

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16

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