OCR
RECOGNISING ACHIEVEMENT

ADVANCED SUBSIDIARY GCE **2506**

COMPUTING

Introductory Computer Systems, Communications and Software

MONDAY 14 JANUARY 2008 Afternoon

Time: 1 hour 30 minutes

Candidates answer on the question paper.
Additional materials: No additional materials are required

CUP/T36575

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or 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.
- Do **not** write outside the box bordering each page.
- Write your answer to each question in the space provided.
- Additional answer space is available on the lined page at the back of this booklet. Answers on this page **must** be clearly numbered.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **90** of which 4 marks are allocated to the assessment of the quality of written communication.
- No marks will be awarded for using brand names of software packages or hardware.

FOR EXAMINER'S USE	
1	
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TOTAL	

This document consists of **11** printed pages and **1** lined page.

[Turn over

Answer **all** questions.

1 When data is transmitted from one device to another it can be sent in serial or in parallel using simplex, half duplex or full duplex modes of transmission.

(a) State what is meant by each of the following terms.

(i) Serial data transmission .....

.....[1]

(ii) Parallel data transmission .....

.....[1]

(iii) Simplex mode of transmission .....

.....[1]

(iv) Half duplex mode of transmission .....

.....[1]

(v) Full duplex mode of transmission .....

.....[1]

(b) Explain why half duplex would be a sensible mode of data transmission when a processor is communicating with a printer.

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.....[2]

2 State what is meant by each of the following input methods. For each one give an example of an application in which it would be used, giving a reason why it is suitable.

(i) MICR .....

.....

Application .....

.....

Reason .....

.....[3]

(ii) OCR .....

.....

Application .....

.....

Reason .....

.....[3]

(iii) OMR .....

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Application .....

.....

Reason .....

.....[3]

3 A company keeps a file of customer orders.

The file contains the following fields

- the name of the customer
- the customer's telephone number
- the amount that the customer owes
- the number of orders that the customer has made in the current year.

(a) State suitable data types for each of the required fields and a suitable fixed size for each.

Field Name	Data Type	Size
CUSTOMER_NAME	.....	.....
TELEPHONE	.....	.....
AMOUNT_OWED	.....	.....
NUMBER_ORDERS	.....	.....

[5]

(b) If the company has 2000 customers, estimate the size of the file. Show your working.

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.....[4]

(c) The company keeps backups of the customer orders file.

Explain what is meant by backups and why they are necessary.

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.....[3]

4 A piece of utility software is a program that is part of the operating system and which carries out a common task.

Describe the purpose of the following utilities.

(i) Anti-virus software .....

.....

.....

.....[2]

(ii) File handling software .....

.....

.....

.....[2]

(iii) Hardware drivers .....

.....

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.....[2]

5 **(a)** A computer system uses even parity to check transmission of single bytes of data.

(i) Write down a byte which would be accepted by the computer system.

.....

.....[2]

(ii) State why your example byte would pass the parity check.

.....

.....[1]

(iii) Explain why your example byte may **not** have been transmitted correctly despite passing the parity check.

.....

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.....[2]

(b) **(i)** Describe what is meant by a protocol in a computer system.

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.....[2]

(ii) One part of a protocol is an agreement about the rate of data transmission, known as the bit rate.

A video clip can be watched as it is being transmitted across a network or it can be saved and watched later.

Explain the difference in the importance of the bit rate in each case.

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.....[4]

6 Describe the transfer of data between primary memory and secondary storage.

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.....[6]

7 **(a)** Explain the difference between systems software and applications packages.

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.....[2]

(b) Describe **three** purposes of the operating system in a computer.

Purpose 1 .....

.....

.....

.....

Purpose 2 .....

.....

.....

.....

Purpose 3 .....

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.....[6]

(c) Explain what is meant by a multi-tasking operating system in a personal computer (PC).

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.....[3]

8 **(a)**
```
1    X=1
2    WHILE X < 3 DO
3        A = X * X
4        OUTPUT X, A
5        X = X + 1
6    ENDWHILE
7    END
```

Complete the following table to dry run the algorithm.

LINE	X	A	OUTPUT	CONDITION
1	1			
2	1			TRUE
3				

[4]

(b) The algorithm outputs consecutive numbers, starting with 1, and their squares.

(i) State what should be changed in the algorithm to output the first 10 numbers with their squares.

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.....[1]

(ii) Rewrite the algorithm using a FOR loop so that the new algorithm will print the numbers 1 to 10 with their squares.

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.....[4]

9 **(i)** State what is meant by a procedure.

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.....[1]

(ii) Explain how a function differs from a procedure.

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.....[2]

(iii) State the meaning of a recursive procedure.

.....

.....[1]

10 **(a)** **(i)** State **three** pieces of information necessary to define an array.

1. .....

2. .....

3. .....[3]

(ii) Explain how different data types can be used in the array.

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.....[2]

(b)
```
FLAG=0,COUNT=1
INPUT VALUE
WHILE FLAG=0 AND COUNT<=MAX_SIZE_OF_ARRAY
    IF ARRAY(COUNT)=VALUE THEN
        OUTPUT COUNT
        FLAG=1
    END IF
    COUNT=COUNT+1
END WHILE
END
```

(i) Describe the purpose of the algorithm.

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.....[2]

(ii) Explain the purpose of FLAG.

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.....[2]

(iii) Give an error message that should be included in the algorithm, stating where in the algorithm it should be placed.

Message .....

.....

Position .....

.....[2]

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