

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

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General Certificate of Education
 January 2005
 Advanced Subsidiary Examination



COMPUTING

CPT1

Unit 1 Computer Systems, Programming and Networking Concepts

Thursday 13 January 2005 Afternoon Session

No additional materials are required.
 You may use a calculator.

Time allowed: 1 hour 30 minutes

Instructions

- Use blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided. All working must be shown.
- Do all rough work in this book. Cross through any work you do not want marked.

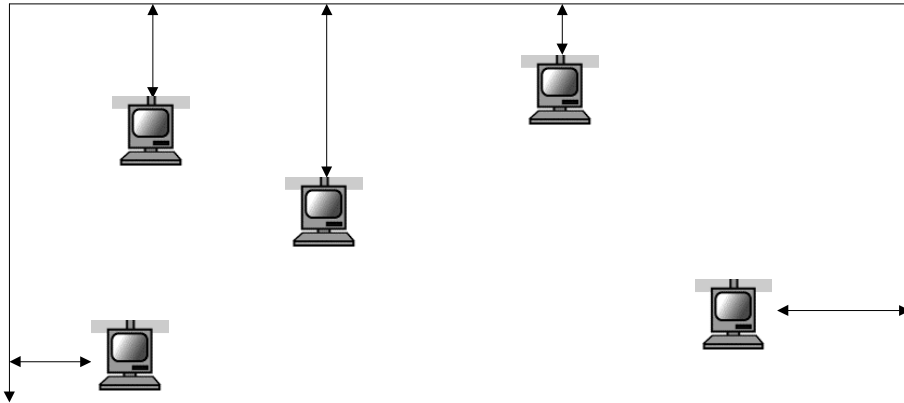
Information

- The maximum mark for this paper is 65.
- Mark allocations are shown in brackets.
- You will be assessed on your ability to use an appropriate form and style of writing, to organise relevant information clearly and coherently, and to use specialist vocabulary, where appropriate.
- The degree of legibility of your handwriting and the level of accuracy of your spelling, punctuation and grammar will also be taken into account.

For Examiner's Use			
Number	Mark	Number	Mark
1			
2			
3			
4			
5			
6			
7			
8			
9			
Total (Column 1)	→		
Total (Column 2)	→		
TOTAL			
Examiner's Initials			

Answer **all** questions in the spaces provided.

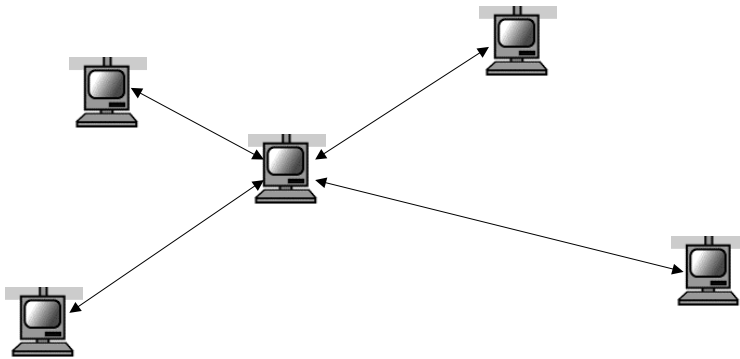
- 1 (a) A small organisation has several computers in an office physically wired together to form a local area network (LAN) as shown below.



What is the name of this network topology?

.....
(1 mark)

- (b) The network could instead be physically wired together where the centrally located computer is a server as shown below.



What is the name of this network topology?

.....
(1 mark)

- (c) (i) State **one** advantage of network (a) compared with network (b) above, and give a reason.

Advantage.....

Reason

.....
(2 marks)

- (ii) State **one** advantage of network (b) compared with network (a) opposite, and give a reason.

Advantage.....

Reason

.....

(2 marks)

6

- 2 (a) One classification of software is *system software*.

- (i) What is meant by system software?

.....

.....

(1 mark)

- (ii) Give **one** example of system software. (Not a product name).

.....

(1 mark)

- (b) Another software classification is *application software*.

- (i) What is meant by application software?

.....

.....

(1 mark)

- (ii) Give **one** example of this **type** of software. (Not a product name.)

.....

(1 mark)

- (c) Software may be off-the-shelf or *bespoke*.

What is meant by bespoke software?

.....

.....

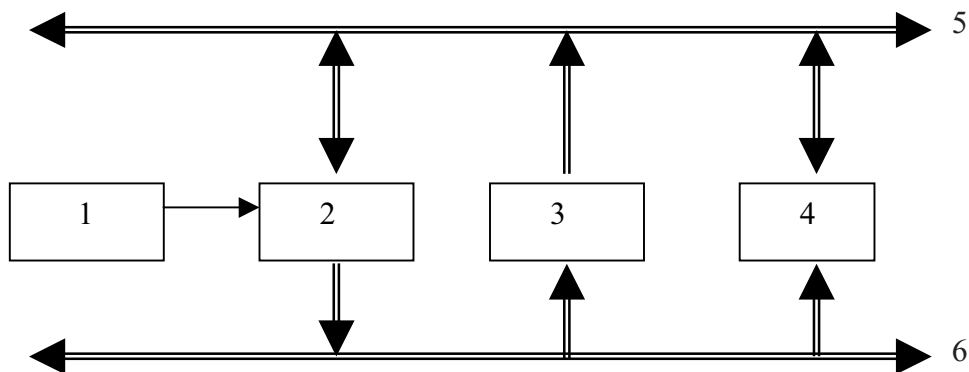
(1 mark)

5

Turn over ►

- 3 Some of the internal components of a computer system are processor, read only memory, random access memory, address bus, data bus, clock.

The diagram below shows how these are connected.



- (a) Give the correct name for **each** of the following as labelled in the diagram above:

- 1
- 2
- 3
- 4
- 5
- 6

(6 marks)

- (b) Which **one** of the above components limits the number of memory locations?

.....
(1 mark)

- (c) Which **one** of the above components limits the amount of data that can be transferred in one go?

.....
(1 mark)

4 A program has been written to store data about a school in a large town. For **each** of the following, name a suitable data type and give a reason for your choice:

(a) number of students in the school;

Data type:

Reason:

(2 marks)

(b) the school's telephone number such as 0122456789;

Data type:

Reason:

(2 marks)

(c) whether the school offers 'A' levels or not;

Data type:

Reason:

(2 marks)

(d) the average number of students per teacher.

Data type:

Reason:

(2 marks)

8

TURN OVER FOR THE NEXT QUESTION

Turn over ►

5 Bit patterns can be interpreted in a number of different ways. A computer word contains the bit pattern 0011 0100.

(a) What is its decimal value if it represents:

(i) a pure binary integer;
(1 mark)

(ii) a BCD (Binary Coded Decimal)?
(1 mark)

(b) Give **one** advantage of BCD over pure binary.

.....
.....
(1 mark)

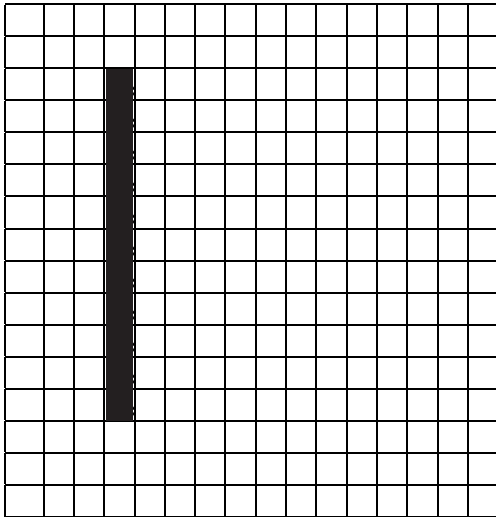
(c) (i) The ASCII value for the character '0' (zero) is 48. What character is represented by 0011 0100?

.....
(1 mark)

(ii) Name **one** other standard coding system for coding information expressed in character or text-based form.

.....
(1 mark)

(d) One method of representing graphics in a computer system is as bit mapped graphics.



The black line on the left might be represented as

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(i) Describe how a coloured line might be represented.

.....

.....

.....

(2 marks)

(ii) Describe how a line would be stored using vector graphics.

.....

.....

.....

.....

(3 marks)

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

6 The following code is part of a high level program

```

Var S: String
Var Count: Integer
Var Size: Integer
S := "fred"
Size := Length(S)
If Size > 0
  Then
    For Count := 1 To Size Do
      ToUpper(S,Count)
    EndFor
  EndIf
EndIf
    
```

(a) By copying **one** relevant line from the above code, give an example of:

- (i) variable declaration (1 mark)
- (ii) selection statement (1 mark)
- (iii) assignment statement (1 mark)
- (iv) iteration (1 mark)

(b) The built in subroutines Length and ToUpper have been used in the above code.

Length(S) returns the number of characters in string S

ToUpper(S,n) converts the nth character of S to upper case

Subroutines can be either *functions* or *procedures*.

(i) By ticking the correct boxes in the table below, indicate whether the subroutines are functions or procedures.

Subroutine	Procedure	Function
Length		
ToUpper		

(2 marks)

(ii) What are the differences between a function and a procedure?

.....

.....

.....

(2 marks)

- 7 (a) Dry run the following algorithm by completing the trace table.

$x \leftarrow 5$
 $y \leftarrow 3$
 $\text{Result} \leftarrow 1$
REPEAT
 $\text{Result} \leftarrow \text{Result} * x$
 $y \leftarrow y - 1$
UNTIL $y=0$

x	y	Result
5	3	1

(7 marks)

- (b) What is the purpose of this algorithm?

.....

(1 mark)

8

TURN OVER FOR THE NEXT QUESTION

Turn over ►

8 (a) Data can be transmitted using parallel or serial transmission. Give **two** reasons why data is normally transmitted over long distances using serial transmission.

- 1.
.....
- 2.
.....

(2 marks)

(b) In the context of serial data transmission describe what is meant by

(i) Baud Rate;

.....
.....

(1 mark)

(ii) Bit Rate;

.....
.....

(1 mark)

(iii) Bandwidth?

.....
.....

(1 mark)

(c) What is the relationship between bit rate and bandwidth?

.....
.....

(1 mark)

6

9 The following is the identifier of a web page.

<http://www.aqa.org.uk/qual/index.html>

Explain what **each** of the following parts of the above identifier mean.

(i) http.....
.....
(1 mark)

(ii) www.....
.....
(1 mark)

(iii) org.....
.....
(1 mark)

(iv) uk.....
.....
(1 mark)

(v) qual.....
.....
(1 mark)

(vi) index.html.....
.....
(1 mark)

END OF QUESTIONS

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE