

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

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General Certificate of Education
 Summer 2003
 Advanced Subsidiary Examination



COMPUTING

CPT1

Unit 1 Computer Systems, Programming and Networking Concepts

Thursday 5 June 2003 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			
Total (Column 1)	→		
Total (Column 2)	→		
TOTAL			
Examiner's Initials			

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

1 (a) Two classifications of software are *System Software* and *Application Software*.

What is meant by

(i) System Software?

.....

(1 mark)

(ii) Application Software?

.....

(1 mark)

(iii) Give an example of System Software (not a product name).

.....

(1 mark)

(b) Application software can be subdivided into *general purpose*, *special purpose* and *bespoke* software.

(i) Give a type of general purpose application software package.

.....

(1 mark)

(ii) What is meant by a special purpose application software package?

.....

.....

(1 mark)

(c) A school is planning to introduce an electronic registration system. The management have the choice of buying a readily available software package or having bespoke software written for them.

(i) What is meant by bespoke software?

.....

(1 mark)

- (ii) Give **one** advantage and **two** disadvantages of bespoke software over readily available software.

Advantage.....
(1 mark)

Disadvantages:

1.....
.....
2.....
.....
(2 marks)

- 2 (a) How many bytes are 1 Kilobyte?.....
(1 mark)

- (b) A computer system uses 2 bytes to store a number.

- (i) What is the largest pure binary integer it can store?
(1 mark)

What is the bit pattern if the number 37 is to be stored as

- (ii) a pure binary integer?

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

(1 mark)

- (iii) a BCD (Binary Coded Decimal)?

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

(1 mark)

- (c) The ASCII coding system uses seven bits to code a character. The character digits 0 to 9 are assigned the decimal number codes 48 to 57. An extra bit is used as a parity bit. A computer system uses the most significant bit (MSB) as a parity bit for each byte and works with **even** parity.

- (i) What is the bit pattern if the digits 37 are to be stored as characters?

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

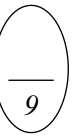
(3 marks)

- (ii) Explain how the parity bit is used by this computer system.

.....
.....
.....

(2 marks)

Turn over ►



3 Some of the components of a computer system are:

Peripherals:

- keyboard 1
- monitor 2

I/O Ports:

- VDU controller 3
- keyboard controller 4

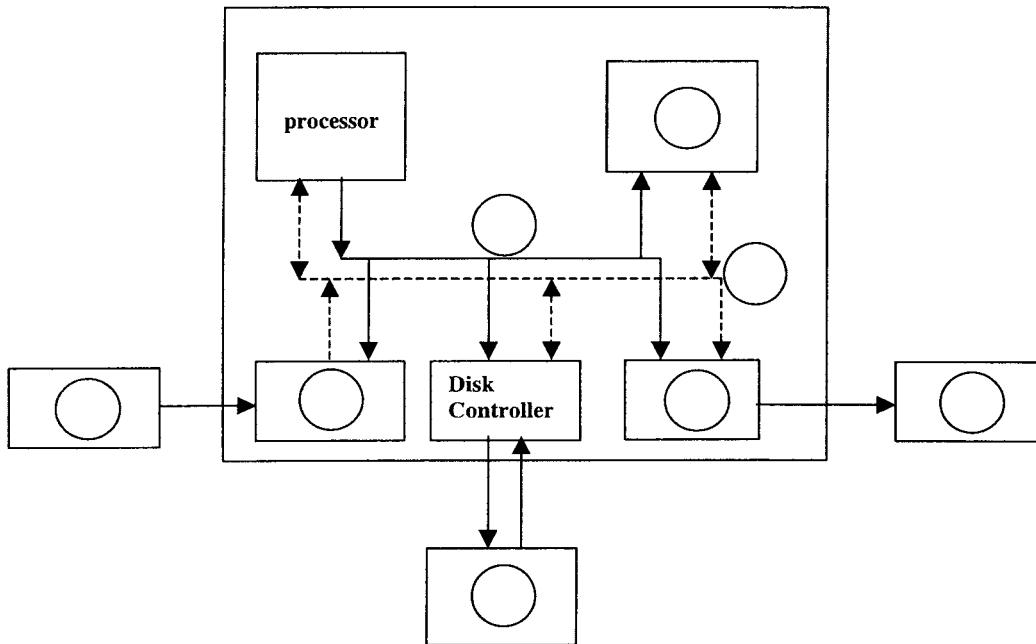
Memory:

- main memory 5
- secondary storage 6

System Bus:

- Data Bus 7
- Address Bus 8

(a) In the diagram below, identify each component by writing its number, given in the list above, in the appropriate circle.



(6 marks)

(b) The above computer system uses the *stored program concept*. Explain this term.

.....

.....

.....

.....

(2 marks)

4 Computer systems store not just information representing numbers and characters, but also sounds and images.

(a) A microphone converts sound into an electrical signal which may be recorded.

(i) Explain how the electrical signal from the microphone is converted into a form which can be stored in a computer system.

.....
.....
.....
.....

(3 marks)

(ii) What piece of hardware is required to convert the digitally recorded sound before it is amplified and played back through speakers?

.....

(1 mark)

(b) Images can be stored as bit-mapped graphics or vector graphics. If vector graphics is used, what information will be stored to describe one straight line?

.....
.....
.....

(2 marks)



TURN OVER FOR THE NEXT QUESTION

Turn over ►

5 (a) The Internet is an example of a Wide Area Network (WAN). Describe a WAN.

.....
.....
(2 marks)

(b) (i) What hardware is required to connect a stand-alone computer system to the Internet?

.....
(1 mark)

(ii) What type of application software is required to access a web site?

.....
(1 mark)

(c) Telephone companies offer *leased line networking* and *dial-up networking* to organisations and individual subscribers.

What is meant by:

(i) leased line networking?

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

(ii) dial-up networking?

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

(d) Communication on the Internet is through *serial data transmission*. What is meant by serial data transmission?

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

(e) *Baud rate* and *bit rate* are often confused. What is meant by:

(i) baud rate?

.....

(ii) bit rate?.....

.....
(2 marks)

6 An example of a Uniform Resource Locator (URL) is <http://www.bbc.co.uk/history>.

(a) What part of the above URL constitutes the domain name?

.....
(1 mark)

(b) Using the URL, explain what each part can tell us.

(i) http.....

(ii) www

(iii) bbc

(iv) co

(v) uk.....

(vi) history.....
(6 marks)

(c) The IP address of the above site is 212.58.224.32.

(i) What is the relationship between the IP address and the domain name?
.....
.....
(1 mark)

(ii) If each group of digits is stored in one byte, what is the range of possible IP addresses?
.....
(2 marks)

10

TURN OVER FOR THE NEXT QUESTION

Turn over ►

7 The following code is part of a high level program to manipulate text:

```

Var S1: String
Var S2: String
Var Ptr: Integer
Var L: String
S1 := "PAT"
S2 := ""                                {"" denotes an empty string}
For Ptr := 1 To 3 Do
    L := Copy (S1, Ptr)
    S2 := Concat (L, S2)
EndFor
If S1 = S2
    Then Print ('True')
    Else Print ('False')
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) iteration..... (1 mark)

- (b) The built-in subroutines **Copy**, **Concat** and **Print** have been used in the above code.

Copy (S, n) returns the n^{th} character of string S
example: Copy ("ABCDE",2) returns the character "B".

Concat (S1, S2) concatenates the two strings S1 and S2 and returns a single string
example: Concat ("ABCD","EF") returns the string "ABCDEF".

Print (S) prints the string S as output.

Subroutines are either *functions* or *procedures*. Indicate, by ticking the correct boxes, what each of the above subroutines is.

subroutine	procedure	function
copy		
concat		
print		

(3 marks)

- (c) Dry run the above code by completing the table below.

S1	Ptr	L	S2
"PAT"			""
	1	"P"	"P"
Printed Output:			

(8 marks)

END OF QUESTIONS