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General Certificate of Education  
 January 2006  
 Advanced Subsidiary Examination



**COMPUTING**  
**Unit 1 Computer Systems, Programming and Networking Concepts**

**CPT1**

Friday 13 January 2006 1.30 pm to 3.00 pm

**You will need no other materials.**  
 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.
- Answer the 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.
- The marks for questions are shown in brackets.
- The use of brand names in your answers will **not** gain credit.
- You are reminded of the need for good English and clear presentation in your answers. Quality of Written Communication will be assessed in these answers.

For Examiner's Use			
Number	Mark	Number	Mark
1		9	
2		10	
3			
4			
5			
6			
7			
8			
Total (Column 1)		→	
Total (Column 2)		→	
TOTAL			
Examiner's Initials			

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

- 1 (a) **Table 1** shows different software items.  
Complete the table by entering the letter which best describes each item of software.  
Note, not all letters will be used.

**Table 1**

<b>Software</b>	<b>Description</b> (letter below)
Route planner software	
New point of sale software for supermarket X's checkout terminals	
Translator software for the Java programming language	
Spreadsheet software	

(4 marks)

- A – general purpose application software
- B – bespoke software
- C – interpreter/compiler software
- D – special purpose application software
- E – operating system
- F – assembler software

- (b) Explain what is meant by a library program.

.....  
 .....

(2 marks)

- 2 (a) (i) Explain **one** difference between a procedure and a function.

.....  
 .....

(2 marks)

- (ii) Name and describe a built-in function you have used in your programming work, or when using a generic software package.

.....  
 .....

(2 marks)

6
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- (b) A particular built-in function is described in a programming language’s help files as follows:

```
Function MatchString(ThisString , StringSearchedFor : String) :Boolean
```

The function **MatchString** returns a **Boolean** value indicating whether or not the string **StringSearchedFor** appears within the string **ThisString**.

An error is returned when a function call is incorrectly formed.

What value is returned to the Result1, Result2 and Result3 variables from the following function calls?

- (i) Result1 := MatchString ('Harry Potter', 'Pot')

.....  
(1 mark)

- (ii) Result2 := MatchString ('Potter', 'Harry Potter')

.....  
(1 mark)

- (iii) Result3 := MatchString ('Harry Potter', 59)

.....  
(1 mark)

- (c) In part (b) (i) Result1 is an identifier used for a variable. Name **two** other uses for identifiers in a high level language.

1 .....

2 .....

(2 marks)

- (d) The programming language being used has both compiler and interpreter software for program development.

Give **one** advantage of the use of each.

Interpreter advantage .....

.....

.....  
(1 mark)

Compiler advantage .....

.....

.....  
(1 mark)

3 **Figure 1** and **Figure 2** below show two versions of the same program.

**Figure 1**

Move	#45,	R0
Move	#4,	R1
Move	#96,	R2
Add	R2,	R1
Add	R1,	R0

**Figure 2**

(c)	
100	00101000 00101101
101	00101001 00000100
102	00101010 01100000
103	10100001 00000000
104	10100000 00000000

(a) What generation of programming language is shown in **Figure 1**?

.....  
(1 mark)

(b) What generation of programming language is shown in **Figure 2**?

.....  
(1 mark)

(c) What would be a suitable heading for the column labelled (c) in **Figure 2**?

.....  
(1 mark)

(d) What software will be needed to translate the program code shown in **Figure 1** to the program code shown in **Figure 2**?

.....  
(1 mark)

(e) What is the relationship between the program instructions shown in **Figure 1** and the program instructions in **Figure 2**?

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

(f) In addition to the executable file, what output could the software referred to in part (d) produce?

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

4 (a) Define the term hardware.

.....  
(1 mark)

(b) You buy a second hand PC from a friend and immediately decide to upgrade some of the internal components of the computer system. Name **two** of the internal components, and explain **one** different benefit for each which should result from the upgrade.

Component .....

Benefit .....

.....

Component .....

Benefit .....

.....

(4 marks)

(c) Some months later you add a component that requires inserting an additional printed circuit board inside the computer. Name the component and explain the new feature/benefit which will result.

Your component should be different from those given for part (b).

Component .....

.....

Benefit .....

.....

(2 marks)

7

**Turn over for the next question**

5 College XYZ has a paper-based system for attendance record keeping. A student's attendance at every lesson is recorded as a series of dashes and circles in a paper register. Every half term the registers are collected by the College's Computing Team. The data from the paper registers is captured by a computer system. Printed reports are then sent to all tutors reporting on student attendance figures.

(a) (i) Define the term information.

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

(ii) Give an example of information in the student attendance application.

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

(b) (i) Give an example (**not** using the application in part (a)) of data from a direct source.

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

(ii) Give an example (**not** using the application in part (a)) of data from an indirect source.

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

6 **Figure 3** shows the main memory and processor of a computer system. Data moves between these two components along the data bus which uses parallel data transmission.

**Figure 3**



(a) (i) Show the binary representation for the denary value 59.

.....  
(1 mark)

(ii) Add to the diagram in **Figure 3** an 8-bit data bus connecting the components showing the value 59 in its binary form being transferred from the main memory to the processor.

(2 marks)

(b) Give **three** possible interpretations of the byte being read in part (a) (ii).

- 1 .....
- .....
- 2 .....
- .....
- 3 .....
- .....

(3 marks)

6

**Turn over for the next question**

7 (a) What type of software is needed to view web pages? (Do not give a product name)

.....  
.....

(1 mark)

(b) Most generic software has features such as printing, help, and formatting.  
Give **two** features which are specific to the software you named in part (a).

1 .....

.....

2 .....

.....

(2 marks)

(c) A computer user is accessing the World Wide Web for the home page, default.htm, of an organisation whose registered domain name is StationeryIsUs.co.uk.

What URL will allow the home page to be found and displayed?

.....

(1 mark)

(d) What could be used instead of a domain name to identify a site on the World Wide Web?

.....

(1 mark)

(e) Domain names are organised on the World Wide Web as a hierarchy.  
Name **two** top level domains.

1 .....

2 .....

(1 mark)



**Turn over for the next question**

8 A firm of solicitors is based in a city centre office occupying two floors. The firm has 15 stand-alone PCs.

The majority of the work involves the word processing of customer documents and contracts. One PC has a connection to the Internet and is used for access to various professional bodies' web sites and the on-line ordering of goods.

The decision has been taken to network the existing PCs.

(a) Give **two** reasons why each PC will need a network adapter card.

- 1 .....
  - .....
  - 2 .....
  - .....
- (2 marks)*

(b) Describe **three** benefits which the network will bring to the company.

- 1 .....
  - .....
  - 2 .....
  - .....
  - 3 .....
  - .....
- (3 marks)*

5

9 A home computer is used to transfer picture files from a camera-phone to the hard disk of a computer using communications software and a Universal Serial Bus (USB) cable.

(a) What is meant by serial data communication?

.....  
.....

(1 mark)

(b) The picture files on the camera are each 768 by 1024 pixels. The pictures are encoded as 256-colour images.

(i) How many bytes are needed to store one pixel?

.....

(1 mark)

(ii) How many kilobytes are needed to store five pictures?

.....

(1 mark)

(c) The camera-phone also plays MP3 sound files. These sound files are produced from music CDs using software on the user's PC. The software has the option to encode the MP3 files at either 64kbps or 128kbps. The MP3 files are then uploaded from the PC to a memory card in the camera-phone.

Give **one** advantage and **one** disadvantage to the user of producing the files at the higher bit rate.

Advantage

.....  
.....

Disadvantage

.....  
.....

(2 marks)

5

Turn over for the next question

10 The data shown in **Figure 4** is a list of surnames of 20 motor car policyholders with the number of claims they have each made in the last five years.

**Figure 4**

	PolicyHolder		NoOfClaims
1	Wilcox	1	1
2	Adams	2	0
3	Pollard	3	0
4	Williams	4	0
5	Searle	5	3
6	Kelly	6	0
7	Lewis	7	1
8	Franks	8	5
9	Patel	9	1
10	Li Che	10	0
...	...	...	...
...	...	...	...
19	Wilkinson	19	3
20	Veale	20	0

- (a) (i) The user inputs a policyholder.  
If the surname is found, the program outputs the number of claims for that policyholder.

```

Read(SearchName)
For P := 1 To 20 Do
    If PolicyHolder[P] = SearchName
        Then GoTo 200
    GoTo 300
200: Write(NoOfClaims[P])
300: End
    
```

Give **two** reasons why this is badly designed program code.

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

- (ii) Write declaration statements (in a language with which you are familiar) for the PolicyHolder or NoOfClaims data structure above, and one other variable used in the code above.

The programming language I am using is .....

1 .....

2 .....

(2 marks)



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