Surname		Other Names	
Centre Number			Candidate Number				
Candidate Signature									

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General Certificate of Education
January 2005
Advanced Subsidiary Examination

ASSESSMENT and QUALIFICATIONS ALLIANCE

COMPUTING CPT2
Unit 2 Principles of Hardware, Software and Applications

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			
10			
11			
12			
Total (Column 1) →			
Total (Column 2) →			
TOTAL			
Examiner s Initials			

LEAVE MARGIN BLANK

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

1 Name the most suitable input device for the following tasks:

(a) transferring data from multiple choice examination scripts into a computer system;

.....

(1 mark)

(b) selecting information from a computer-based information system in a busy Tourist Information Centre;

.....

(1 mark)

(c) creating a cartoon character which will be used for computer animation.

.....

(1 mark)

3

2 (a) How can data inconsistency arise in an application based on a flat file approach?

.....

.....

.....

(2 marks)

(b) How is data inconsistency avoided when a database approach is used?

.....

.....

.....

(2 marks)

4

3 Computers and microprocessors are being used to help people with different needs. Describe **two** different ways in which this technology can help someone if they have no arms or they have no legs. Your answer should make clear **what** the technology enables the person to do, and **how** they are now able to do it.

1 .....

.....

.....

2 .....

.....

.....

(4 marks)

4

4 The Royal Mail needs to keep track of the collections made from each post box.

A plate is fixed inside each post box with a code on it. When a postman empties the post box, he reads the code with an appropriate reader, and data is transmitted immediately to a computer in the local Head Office.

(a) How could the data on the plate be encoded so that it can be read? Justify your answer.

.....

.....

(2 marks)

(b) What **two** pieces of data will be sent to the Head Office? Give the source of **each** piece of data.

Data .....

Source .....

Data .....

Source .....

(4 marks)

(c) How might this data be transmitted directly to the Head Office?

.....

(1 mark)

7

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5 When creating a computerised slide presentation, care must be taken over the design of the slides. One important criterion for good slide design is: *Use a large font*. Give **three** more criteria.

1 .....

2 .....

3 .....

(3 marks)

3

6 Different operating systems have been developed with different operating requirements. For example, two operating requirements of batch operating systems are

- batch operating systems support programs which are sequential in nature;
- programs running under batch operating systems run from start to finish without user intervention.

(a) Give **three** operating requirements of a real time operating system.

1 .....

.....

2 .....

.....

3 .....

.....

(3 marks)

(b) Give an example of a type of application for which a real time operating system is necessary.

.....

.....

(1 mark)

4

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7 (a) Write the names of the following removable secondary storage media in the appropriate cell in **Figure 1**.

Floppy disk
Read only DVD
Recordable CD-R
Zip disk

Typical Capacity	Storage Medium
< 2 MB	
250 MB	
600 – 700 MB	
4 – 10 GB	

Figure 1

(3 marks)

(b) Write the names of the following removable secondary storage media in their appropriate cell in **Figure 2**.

Flash memory
CD-R
Floppy disk
DAT magnetic tape

Used for	Storage Device
Distributing commercial software	
Storage in digital cameras	
Regular system backups	
Exchanging small files	

Figure 2

(3 marks)

6

8 **Figure 3** shows a directory listing for the sub-directory \My Documents on a PC.

My Documents			
Name	Size	Type	Modified
Home		File Folder	29/09/04
My Pictures		File Folder	27/09/04
My Music		File Folder	11/07/04
Bolero.wav	897	Wave Sound	08/06/00
Fractal.pas	22	Application	18/08/04
HomePage.htm	20	HTML File	21/08/04
Sunrise.jpg	504	JPG File	27/09/04
The boys.bmp	2986	BMP File	13/10/04

Figure 3

(a) What units might be used for the above file sizes?

.....

(1 mark)

(b) Files can be *text* or *non-text* files.

(i) What is the difference between a text file and a non-text file?

.....

.....

(1 mark)

(ii) Name a text file from **Figure 3**.

.....

(1 mark)

(iii) Name a non-text file from **Figure 3**.

.....

(1 mark)

(c) (i) The sub-directory Home contains a file called artwork.bmp. What is the full pathname of this file?

.....

(1 mark)

(ii) Draw a diagram of the part of the directory structure from the root directory down to the file artwork.bmp.

(2 marks)

7

9 (a) Why is data backed up?

.....

.....

(2 marks)

(b) Why is data archived?

.....

.....

(2 marks)

4

10 A student is creating the spreadsheet shown in **Figure 4**. It shows the analysis of some sales figures.

	A	B	C	D	E	F	G	H
1			**Annual Sales Analysis**					
2				Sales in	£1000		17.50%	
3		Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	VAT	Bonus
4	Area 1	24.5	26.1	18.7	25.2	94.5	16.5375	
5	Area 2	19.4	18.6	20.3	23.5	81.8	#VALUE!	
6	Area 3	21.4	22.5	20.9	26.7	91.5	1513.181	
7	Area 4					0	#VALUE!	
8	Area 5					0	0	
9								
10		Bonus						
11		Over						
12		0	0%					
13		50	5%					
14		75	7.5%					
15		85	10%					
16		95	11%					

Figure 4

(a) The formula written in cell G4, and copied down column G, was meant to calculate the VAT using the current VAT rate shown in cell G2, as a percentage of the total value in cell F4.

(i) What is the most likely cause of the error shown in column G?

.....

(1 mark)

(ii) Write the correct formula for cell G4.

.....

(1 mark)

(b) The bonus payments, in column H, are to be based on the total value of sales for the year, as shown in column F. The percentage bonuses that can be earned are shown below the main spreadsheet, in cells B12 to C16. What spreadsheet feature could be used to construct a formula in column H to calculate the bonus earned in each Area?

.....

(2 marks)

(c) To complete the task, the student has to be able to record the figures for successive years. What feature of spreadsheets could be useful here?

.....

(1 mark)

(d) The student had the choice of using either a spreadsheet or a database for this task.

(i) Give **one** reason why a spreadsheet would be more suitable.

.....

.....

(1 mark)

(ii) Give **one** reason why a database would be more suitable.

.....

.....

(1 mark)

7

11 Individuals give away information about themselves to computer systems sometimes without realising it; for example, by using the loyalty card scheme operated by some major supermarket chains.

(a) Suggest **two** types of personal information that a shopper using his/her loyalty card at the time of a purchase can inadvertently give away.

1 .....

2 .....

(2 marks)

(b) State **two** uses that a store could make of this sort of information.

1 .....

2 .....

(2 marks)

(c) The Data Protection Act covers the gathering, storing and access to data. State **two** principles that relate to the **gathering** of data.

1 .....

.....

2 .....

.....

(2 marks)

6

12 For a research project into the population and migration of mute swans, birds are tagged, and released.

- For each swan, the tag number is 8 digits long.
- Once the initial tagging operation is completed, each tag number is recorded with details of the location and date for that tagging and the identity of the tagger.
- These details are stored in a sequential file called **SwanTags** in tag number order.
- When a tagged swan is later retrieved, the tag number from the tag is sent to the researcher, together with the location and date of this retrieval.

This data is being used to answer such questions as:

- What route do swans take to and from their winter feeding grounds?
- How long do they take for each stage of this journey?

(a) The tagging numbers from captured, tagged swans come in over a period of time, and are initially simply logged by the computer system, in a file called **Retrievals**. What type of file organisation could be used for this? Justify your choice.

Type .....

Justification .....

.....

(2 marks)

(b) For the next stage of the project, all the records from the file **Retrievals** have to be matched with the records from the file **SwanTags**, to find out which tags have not been retrieved. How should the file **Retrievals** be organised for this? Justify your choice.

How organised .....

Justification .....

.....

(2 marks)

(c) If a late tagging record arrives from a remote location, it has to be added into the file **Retrievals**. Write an algorithm for doing this.

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4 marks)

(d) During the process outlined in part (b) opposite, the details of the two files are combined into a third file **Taggings**. Records from the file **Taggings**, are to be accessed individually to be analysed. This is to be repeated a number of times for different selections of records. What type of file organisation should be used for this file? Justify your choice.

Type .....

Justification .....

.....

(2 marks)

10

END OF QUESTIONS

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE