Surname		Other Names	
Centre Number			Candidate Number	
Candidate Signature			

For Examiner's Use

General Certification of Education
June 2007
Advanced Subsidiary Examination

ASSESSMENT and QUALIFICATIONS ALLIANCE

COMPUTING **CPT2**
Unit 2 Principles of Hardware, Software and Applications

Tuesday 22 May 2007 9.00 am to 10.30 am

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.
- Show all your working.
- Do all rough work in this book. Cross through any work you do not want to be 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.

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

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

1 An AS Computing student is writing up her CPT3 Practical Exercise documentation. **Figure 1** shows the footer of one page of this document.

Figure 1

H:\ATFC\Sixth\Jones1111\CPT3\PE.doc	Page 17 of 25	Centre Number 11111 Candidate Number 1111

(a) An expression such as 'H:\ATFC\Sixth\Jones1111\CPT3\PE.doc' can be placed in a document footer. What does this expression represent?

.....

(1 mark)

(b) What information is provided by the following parts of the expression above?

(i) H:\ .....

(1 mark)

(ii) CPT3 .....

(1 mark)

(iii) PE .....

(1 mark)

(iv) .doc .....

(1 mark)

5

2 (a) Why are data backed up?

.....

.....

(2 marks)

(b) Why are data archived?

.....

.....

(2 marks)

4

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3 The checkout terminals at a garden centre are used to carry out the following tasks:

- record the purchased items
- record the method of payment to be used
- validate the payment if made by credit or debit card.

The terminals also prompt the sales assistant at various stages during a transaction and produce a customer receipt.

Space at the checkout desks is limited, so input and output devices have been chosen to take up as little space as possible. For instance, there are no keyboards.

Name **three** input devices that might have been chosen for these terminals which will satisfy the requirements of the system. For **each** device, explain its role in the system.

Device 1 .....

Role .....

.....

Device 2 .....

Role .....

.....

Device 3 .....

Role .....

.....

(6 marks)

6

Turn over for the next question

LEAVE MARGIN BLANK

4 A company stores all its data in an on-line information retrieval system. Some of this data is personal data about the employees; some of it is confidential data about the business. All staff have authorised access to those parts of the system which they need to carry out their job role.

(a) (i) Describe **two** distinct steps that should be taken to minimise unauthorised access by staff to those parts of the system they have no need to access in order to carry out their job role.

1 .....

.....

2 .....

.....

(4 marks)

(ii) How could such unauthorised access be detected?

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(1 mark)

(b) What safeguards should be used to keep the data protected from loss or corruption due to:

(i) Hackers

.....

(1 mark)

(ii) Viruses

.....

(1 mark)

(iii) A system failure caused, for example, by a power cut?

.....

(1 mark)

(c) Describe **one** further safeguard which needs to be in place to enable the company to get back into operation swiftly and effectively after a serious problem causing a complete system failure.

.....

.....

.....

(1 mark)

9

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5 (a) (i) One of the roles of an operating system is the management of hardware resources. Explain what *management* means in this context.

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.....

.....

(2 marks)

(ii) Give **three** distinct types of hardware resource that would be managed by an operating system for a stand-alone PC.

1 .....

2 .....

3 .....

(3 marks)

(b) A second role of an operating system is the provision of a **virtual machine**. What does this mean?

.....

.....

(2 marks)

(c) (i) Give **one** example of a task that could be carried out under batch processing.

.....

(1 mark)

(ii) Give **two** operational characteristics of **batch processing**.

1 .....

.....

2 .....

.....

(2 marks)

(d) Give **two** operational characteristics of a batch **operating system**.

1 .....

.....

2 .....

.....

(2 marks)

Turn over ▶

6 A judo club has bought a computer, but the only software on it is an operating system. The secretary and treasurer, who will be the main users of the computer, are reasonably competent computer users. The club may consider using e-mail and the Internet in the future, but not at present.

The computer will be used mainly for the following tasks.

- Recording details of members, including personal details, the levels they have reached in judo, the competitions they have entered and the medals they have won.
- Managing the finances of the club, such as the hire of the hall, subscriptions paid and the costs of travelling to competitions.
- Producing notices for the notice board.
- Producing letters to send to members, for example, regarding renewal of subscriptions or asking members at a certain level if they would be available for a particular competition.

(a) Suggest suitable types of general purpose application software for the club and justify your choice by showing that the tasks given above will be covered by your suggested software.

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(6 marks)

(b) (i) What legislation must the club be aware of if they use their computer for the tasks described above? Explain your answer.

.....

.....

.....

.....

(2 marks)

(ii) State **one** practical measure the club must follow in order to comply with this legislation.

.....

.....

(1 mark)

9

7 Write in the appropriate cells in **Table 1**, the names of the secondary storage media listed below that most closely match the given typical storage capacities.

DVD flash memory hard disk CD-ROM Zip disk

Table 1

Typical Capacity	Storage Medium
100 Megabytes – 750 Megabytes	
650 Megabytes – 800 Megabytes	
128 Megabytes – 12 Gigabytes	
4.5 Gigabytes – 50 Gigabytes	
40 Gigabytes – 500 Gigabytes	

(4 marks)

4

Turn over for the next question

8 Fixed length records in a sequential file, Product, have the following structure.

- ProductID 6 characters
- Description 36 characters
- Price a real number to 2 decimal places, allocated 8 bytes by the programming language used
- NumberInStock an integer, allocated 4 bytes by the programming language used

(a) On close examination, it is found that 20% of the file space is wasted unnecessarily. Why can this occur with the given record structure?

.....

.....

(2 marks)

(b) The record structure could be changed to a variable length record structure, retaining the four fields per record. Explain how this restructuring would affect the file space used?

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.....

.....

(2 marks)

(c) Give **three** disadvantages of the restructured solution.

1 .....

2 .....

3 .....

(3 marks)

(d) Product is a master file stored on a sequential medium in ProductID order. Throughout the day, each transaction relating to the Product file is stored in a serial transaction file. At the end of each day, the transaction file is sorted into ProductID order and the two files are processed against each other to update the number in stock. This process creates a temporary master file NewProduct.

Complete the processing steps below. There may be more than one transaction for some products, but other products may have no transactions recorded. There will be no transactions for records which do not already exist in the Product master file.

```
Open Product file for reading
Open Transaction file for reading
Open NewProduct file for writing
Read first record from Product file
Read first record from Transaction file
While Not EOF Transaction file
  If Product.ProductID < Transaction.ProductID

    Then ..........................................................

    ..............................................................
    Else
      While Product.ProductID = Transaction.ProductID

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

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

      EndWhile

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

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

  EndIf
EndWhile
While Not EOF Product file

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

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

EndWhile
Close all files
Archive Product file
Rename NewProduct file as Product
```

(5 marks)

12

Turn over ▶

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9 Radio frequency identification (RFID) is an automatic identification method. Tags attached to, or inserted into a product, an animal or a person are used to store and transmit data for remote retrieval.

A tag consists of a small chip and an antenna which enables it to receive and to respond to radio frequency signals from a reader device. Tags can be 'read' by supermarket shelves, microwave ovens, fork lift trucks and so on.

Each reader is typically connected to a server via a network. A server can look up the code read from the tag in a database to identify the tagged item uniquely and then take appropriate action. Tags do not need to be in line of sight to be read, and they can be read even if they are in your pocket!

Examples of the use of RFIDs include:

- inserting a chip under the skin of a pet
- tagging airline passengers' luggage
- tagging containers that are used to transport goods around the world
- tagging euro notes
- inserting tags inside clothes and other retail goods

(a) Using only the applications listed above, give **two** benefits of RFIDs to organisations that might use them.

1 .....

.....

2 .....

.....

(2 marks)

(b) Using only the applications listed above, give **one** benefit of RFIDs to a member of the public.

.....

.....

(1 mark)

(c) Using only the applications listed above, give **one** concern an individual might have about the use of RFIDs.

.....

.....

(1 mark)

END OF QUESTIONS

4

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