

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

For Examiner's Use

General Certificate of Education
January 2007
Advanced Subsidiary Examination



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

Monday 15 January 2007 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.
- 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. Quality of Written Communication will be assessed in all answers.

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

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

1 For **each** of the following activities, state which **one** of **batch operation, interactive operation, real time operation, or network operation** would be most appropriate.

(a) Developing a computer program.

.....
(1 mark)

(b) An automatic train control system for driverless trains.

.....
(1 mark)

(c) Sending a document to print on another work station.

.....
(1 mark)

(d) The production of monthly telephone bills.

.....
(1 mark)

4

2 (a) In a text file, most bytes represent printable characters, for example upper case characters. Give **two** further examples.

1

2

(1 mark)

(b) A text file may also include some control characters. Give **two** examples of control characters.

1

2

(1 mark)

2

3 (a) For **each** of the following situations in a small business, give **one** appropriate storage medium from the list below. Justify your choice.

Flash memory, CD-R, hard disk, DAT tape, floppy disk

(i) Storage of applications and data used on a daily basis.

Medium

.....

Justification (2 marks)

(ii) Regular overnight backup of data.

Medium

.....

Justification (2 marks)

(iii) Archiving several megabytes of data.

Medium

.....

Justification (2 marks)

(b) What would you expect of a printer that was to be used to print photographs as well as routine documents? Give **three** features.

1

2

3 (3 marks)

4 The following are parts of three tables in a relational database for a book loan system.

Member

MemberID	Surname	Forename	TelephoneNumber
...
IV270023	Smith	Gerald	01234 567890
IV270024	Smith	Wendy	01234 567890
IV280016	Pope	Anne	01234 465987
IV280017	Patel	Arwen	01234 657980
...

Book

BookID	Title	Author	Value
...
1457X	Travels with my Family	A M MacIntyre	£13.50
14582	Travels with my Family	A M MacIntyre	£13.50
15635	By Bicycle to Bangor	A M MacIntyre	£14.75
16370	Walking in Wonderland	B G O'Connor	£15.99
...

Loan

BookID	MemberID	DateOut	DateIn	DateReturned
...
1457X	IV270023	07/12/06	28/12/06	22/12/06
16370	IV270024	07/12/06	28/12/06	22/12/06
15635	IV270024	07/12/06	28/12/06	22/12/06
...

(a) How are relationships between entities implemented with relational database software?

.....
(1 mark)

- (b) Give the primary key for the entity Loan.

.....
(2 marks)

- (c) The Book table has an index on the attribute Author. Why is indexing used?

.....
(1 mark)

- (d) The last digit of the BookID is used for validation. What type of validation control is this an example of?

.....
(1 mark)

5

Turn over for the next question

5 (a) A student has been asked to explain the difference between *security* and *integrity* of data. Give an example for each of **two** different types of failure of security and give **two** different **reasons** for a failure of integrity which the student might use to demonstrate the difference between the meaning of these two terms.

(i) **Examples** of a failure of security.

1

2

(2 marks)

(ii) **Reasons** for failure of integrity.

1

2

(2 marks)

(b) Schools and colleges keep many electronic records of personal data on their students.

(i) What is meant by the term ‘Personal Data’ as used in the Data Protection Acts of 1984 and 1998?

.....

(1 mark)

(ii) The Data Protection Act 1998 states that all reasonable steps must be taken to ensure that personal data are kept secure.

For **each** of the types of security problems you have given in part (a) (i), describe a practice that a school or college might implement to protect students’ personal data. Your **two** practices must be different.

1

2

(4 marks)

6 Electronic Point of Sale terminals are now in widespread use in retailing. Imagine you are involved in the development of a basic system.

(a) What would be given as the **purpose** of the system? Give **three** significant points.

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

(3 marks)

(b) (i) What data would be expected as **inputs** to the system? Give **two** inputs.

1
2

(2 marks)

(ii) What **outputs** would be expected from the system? Give **two** outputs.

1
2

(2 marks)

(c) Give **two** significant **processing tasks** which must be done by the system.

1
.....
2
.....

(2 marks)

(d) Many large stores now offer loyalty cards to regular shoppers. Explain **two** reasons why a large chain believes it is worth the cost of offering loyalty cards.

1
.....
2
.....

(4 marks)

7 When Jan Bloggs sits at a PC in a computer room and logs on to her school network, she knows that she can access the following drives and directories.

C:\MyDocuments which is on the PC she is working at.

H:\MyCollege\BloggsJ

N:\ProgramFiles

Q:\Year12SampleWork

Jan knows that the last three are on the school network server.

(a) Select the most appropriate term from the list below to complete the following statements. (Not all terms in the list will be used.)

directory, file, folder, full file pathname, hard drive, logical drive, physical drive, root directory, sub-directory, sub-folder

(i) C:\ is located on the of the PC. (1 mark)

(ii) MyCollege is a (1 mark)

(iii) BloggsJ is a (1 mark)

(iv) H:, N:, and Q: are each a (1 mark)

(b) Jan opens the file H:\MyCollege\BloggsJ\Programming\TryThis.pas. This is a source file written in the Pascal programming language. She makes changes to the file TryThis.pas before saving it. How may the changed file be saved without over-writing the original version? Give **two** different ways.

1
2 (2 marks)

(c) Jan decides to make a hard copy of the source code contained in TryThis.pas. What output device will she use for this?

..... (1 mark)

(d) Jan creates a file with the following fixed-length record structure:

(BookingID, Contact, TelephoneNumber, Price)

(i) Calculate the file size for this file in bytes, showing your working, if:

- BookingID is a character string with the format **wwdt** where
 - **ww** is the week number
 - **d** is a digit between 1 and 7 (Sunday to Saturday)
 - **t** is a character representing the time period for the booking:
M (morning), A (afternoon), E (evening) or X (evening extension).
- Contact is a character string of length 25.
- TelephoneNumber is a character string of length 11.
- Price is a real number to 2 decimal places. The software has allocated 8 bytes for this.
- Jan has decided to hold records of 100 bookings.
- The system uses 8-bit ASCII to code characters.

.....
(2 marks)

(ii) Why might the actual size of the stored file be bigger than your calculated answer?

.....
(1 mark)

Turn over for the next question

8 (a) A Computing class was learning the principle and process of updating a sequential master file from a transaction file. They were told that they should arrange that *the master file should be updated in one pass*.

(i) What does the statement in italics mean?

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

(2 marks)

(ii) What is the advantage of completing the update process in one pass?

.....

(1 mark)

(b) A picture framer has a stock control system for frames, glass, mounts and other materials. The stock control software uses a sequential master file of these materials, ordered by their part number. During the week, as the picture framer completes each job, it is recorded, with the material used, in a transaction file. At the end of the week, the master file is updated from the transaction file.

By considering the file organisation of these two files, explain exactly how the stock control software will enable the master file to be updated in one pass in this process?

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

(3 marks)

- 9 (a) Spam is unwanted advertising e-mail. It has been estimated that it accounts for more than half of e-mail traffic. Explain **three** different unwelcome consequences of spam; **one** social, **one** economic and **one** ethical.

Social

.....

(2 marks)

Economic

.....

(2 marks)

Ethical.....

.....

(2 marks)

- (b) Give **one** method of restricting the effects of spam.

.....

(1 mark)

END OF QUESTIONS

7

There are no questions printed on this page