

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

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General Certificate of Education
 January 2004
 Advanced Subsidiary Examination



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

Tuesday 13 January 2004 Afternoon Session

No additional materials are required.
 You may use a calculator.

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

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.

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

1 For each of the following situations, a solution has been suggested. In each case explain why you think the suggested solution **is, or is not**, the most appropriate. Your judgement should be clear from your explanation.

(a) A small travel company has obtained a very good deal for a specialist holiday. It wishes to contact only those customers who might be interested in this offer.

Suggested solution: Mail merge only selected customers.

.....
.....

(1 mark)

(b) A businessman travels frequently, and to many different places, world-wide. He needs to keep in contact with his office and with his family.

Suggested solution: Communicate with office and family using e-mail.

.....
.....

(1 mark)

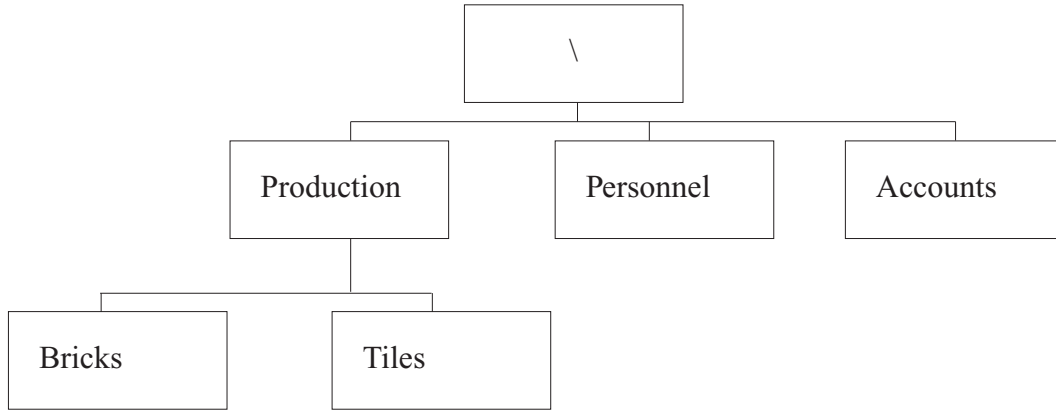
(c) A trainer has to give a lecture on a new development. She needs to prepare visual aids and handouts for her audience.

Suggested solution: Prepare the visual aids using a desktop publishing package.

.....
.....

(1 mark)

2 The *directory* structure shown below contains a root directory (\) and five sub-directories. The directories are stored on logical drive C:



(a) Explain the term directory in this context.

.....

 (2 marks)

(b) There is a file named hand-made.xls in the sub-directory Bricks.

(i) What is its full pathname?

.....
 (1 mark)

(ii) The office clerk now wants to save a different file in the sub-directory Tiles using the same filename and extension. How can the system tell these two files apart?

.....
 (1 mark)

(c) The company accountant reports that last year's accounts files have been archived.

(i) DAT Tape, Writeable CD Rom, microfiche and floppy disk are examples of media which are chosen for the archiving of a company's files. Give the **one** fact that all of these have in common which explains why they are used as archiving media.

.....
 (1 mark)

(ii) Give **two** reasons why last year's accounts data would have been archived.

1

.....

2

.....

(2 marks)

Turn over ►

3 A file in a library has 100 records with the following record structure.

ISBN, Title, Author, Keywords

The system uses 8 bit ASCII to code characters. All fields in these records are fixed length strings.

ISBN is a 10 digit code. Title is 30 bytes long. Author is 25 bytes and Keywords is 200 bytes long.

(a) What is the size of this file in bytes? Show your working.

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

(b) What should be the primary key for these records?

Justify your choice.

.....
(2 marks)

(c) At present these records are fixed length. Give **one** advantage and **one** disadvantage of storing them as variable length instead of fixed length records.

Advantage:
.....

Disadvantage:
.....
(2 marks)

4 Chris, a temporary employee in the Personnel Department of ABC plc, guessed the Personnel Director’s User ID and password, and logged into the computer system. Chris then changed the salary details of some of the employees on the company’s payroll file.

(a) What **two** offences did Chris commit under the Computer Misuse Act of 1990?

- 1
- 2 *(2 marks)*

(b) Chris had been left alone in the office. Describe **three** methods of security the company could have used to prevent or detect what had happened. These should not inhibit the normal running of an office.

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

5 Most methods of data encryption involve the use of a key or keys. The EU and some governments want to make it law that these keys should be made available to ‘trusted’ third parties. Explain why this might be seen as **a good thing or a bad thing** by **each** of the following listed below. In each case your judgement should be clear from your explanation.

(a) The individual citizen;

-
- *(1 mark)*

(b) A large multi-national corporation;

-
- *(1 mark)*

(c) Governments.

-
- *(1 mark)*

5

3

Turn over ►

6 A local Adult Education Centre uses a relational database to manage its day and evening classes. Two relations (tables) are used.

Class (ClassID, Subject, Level, Day, Time, LecturerID)

Lecturer (LecturerID, Subject1, Subject2, Name, Address, PhoneNumber)

(a) (i) What is a primary key?

.....

 (1 mark)

(ii) Suggest a suitable primary key for the relation Lecturer.

.....
 (1 mark)

(b) (i) What is meant by a foreign key?

.....

 (1 mark)

(ii) Name the attribute which is the foreign key in the relation Class.

.....
 (1 mark)

(c) Indexes are created on Day and Subject1 attributes. Why are indexes created?

.....

 (1 mark)

(d) The following shows extracts from the Class and Lecturer tables.

ClassID	Subject	Level	Day	Time	LecturerID
Art01	Drawing	Beginners	Tuesday	2.30	10245
Art02	Drawing	Intermediate	Thursday	7.30	10275
...
Art15	Embroidery	Advanced	Monday	10.30	10245
...
Fit23	Yoga	Intermediate	Thursday	2.30	31892
Fit24	Yoga	Intermediate	Friday	10.30	31892
Lang03	Urdu	Advanced	Thursday	7.30	25410
Lang04	French	Beginners	Tuesday	2.30	10356

LecturerID	Subject1	Subject2	Name	Address	PhoneNumber
10123	Reflexology	Yoga	Ms C Williams	23 New Rd, Ashbridge	01254 327812
10245	Embroidery	Drawing	Mrs J Evans	166 London Rd, Bury	01254566278
10275	Art		Mr J Tyron	47 The Avenue, Gresham	01245823914
10356	French	Italian	Mr K Stone	16 Old St, Rushton	01254688192
25410	Urdu	Gujerati	Mr G Singh	67 New St, Bury	01254188209
31892	Yoga	Aerobics	Ms T Luvly	231, Cox St, Appleton	01254713489

The following shows a Query by Example (QBE) applied to the Class and Lecturer tables.

Field	Subject	Day	Time	Name	PhoneNumber
Table	Class	Class	Class	Lecturer	Lecturer
Sort	Ascending				
Show	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria			2.30		

Using the table below, show the result of this query based on the records shown above.

(3 marks)

(e) Complete the following QBE to extract when Mrs Evans runs her embroidery class.

Field					
Table					
Sort					
Show	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria					

(4 marks)

TURN OVER FOR THE NEXT QUESTION

Turn over ►

- 7 Mr Amos is Personnel Director for a medium-sized company which operates on four sites. He has to visit each site frequently, and uses his own car to do this.

The company gives him a mileage allowance for this purpose. This is calculated at 40p per mile for the first 10000 miles travelled in the current tax year and 25p per mile for the remainder. He has set up a spreadsheet worksheet to work out how much it is costing him to run his own car. He re-uses the worksheet each month.

Figure 1 below shows his worksheet with the data for one particular month.

	A	B	C	D	E	F
1	<u>Car Costs - September</u>					
2	Mileage:		Mileometer Reading		Actual miles travelled this tax year	
3	Miles recorded at start of tax year		63571			
4	Miles recorded at start of month		71387		By start of month	7816
5	Miles recorded at end of month		73625		By end of month	10054
6					This month	2238
7	<u>Allowance this month</u>	Rate (p)	Rate (p)			
8		40	25			
9	Miles @ rate	2184	54			
10	Amount (£)	873.60	13.50			
11	<u>Total Allowance:</u>		887.10			
12	<u>Expenses</u>	Litres	Cost £			
13	Fuel	331.46	250.44		<u>Miles/litre</u>	6.75
14	Parking		10.20			
15	1/12 of Road Fund Licence		13.75			
16	1/12 of Car Insurance		43.67			
17	Car Servicing		519.27			
18	Total Expenses		837.33			
19						
20	Net Profit / Loss		49.77			

Figure 1

(a) (i) How has the text **Car Costs – September** in row 1 been positioned?

.....
(1 mark)

(ii) What feature has been used to format the text in row 2?

.....
(1 mark)

(b) The figure for **Miles/litre**, shown in cell F13, is calculated by dividing the miles travelled this month by the litres of fuel bought.

(i) Write a suitable formula for this calculation.

.....
(1 mark)

(ii) The result of dividing 2238 by 331.46 is 6.7519459. However, the value displayed in cell F13 is 6.75. How might this happen?

.....
(1 mark)

(c) Mr Amos finds he mis-typed the figure for the Car Servicing in cell C17. It should have read 591.27 instead of 519.27. When he corrects this, which other cells are affected?

.....
(1 mark)

(d) The formula used in cell C9 is =IF(F5 <=10000,0,F5 – 10000). State the purpose of each part of this formula and explain the logic of the expression used.

(i) $F5 \leq 10000$

Purpose

Logic

(2 marks)

(ii) 0

Purpose

Logic

(2 marks)

(iii) $F5 - 10000$

Purpose

Logic

(2 marks)

Turn over ►

8 Cosmos Construction employs about 200 employees spread over a number of different sites.

(a) Employees clock in and out at their place of work by swiping a plastic ID card. The card stores the employee identification number and other personal information.

(i) Name a suitable storage medium in the ID card.

.....
(1 mark)

(ii) What could be built into the card to prevent a person clocking in as someone else?

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

(iii) Suggest **three** items of data that would have to be recorded by the clocking-in machine when an employee clocked in or out.

1
2
3
(3 marks)

(iv) Name a suitable storage medium in the clocking-in machine.

.....
(1 mark)

(b) A file called **Employees** is stored on the Head Office computer. This file stores all information about the employees, including tax code and other payroll data. This file is organised sequentially and records are stored in employee identification number order.

An employee retires from the company. List the steps required to remove this person's record from the Employees file.

.....
.....
.....
.....
.....
(5 marks)

- (c) The clocking-in machines on each site are automatically polled by the Head Office computer every night. The daily clocking-in data is collected and stored, at Head Office, in a file `Clock_week_number_n`, where n runs from 1 to 53.

What peripheral must be built into the clocking-in machines to enable the polling to take place?

.....
(1 mark)

- (d) The weekly payroll program uses the principle of *master* and *transaction* files.

- (i) Which file is the master file in this program?
(1 mark)

- (ii) Which file is the transaction file?
(1 mark)

- (iii) In what order should the records in the transaction file be stored to allow the master file to be updated in one pass? Justify your answer.

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

- (e) The payroll program is run under a *batch* operating system. Give **two** operational characteristics of a batch operating system.

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

END OF QUESTIONS