

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

Leave blank

General Certificate of Education
 Summer 2002
 Advanced Subsidiary Examination



COMPUTING
Unit 3 Practical Systems Development

CPT3

Monday 13 May 2002 Afternoon Session

In addition to this paper you will require:
 your completed Practical Exercise for CPT3
 You may use a calculator.

For Examiner's Use			
Number	Mark	Number	Mark
1			
2			
3			
4			
5			
6			
7			
8			
9			
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.

At the end of the examination

Hand in **both** this question paper **and** your Practical Exercise documentation to the invigilator.

Warning: If you do not hand in both documents it may not be possible to issue a result for this unit.

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

Answer this paper using the documentation which you have prepared for the *Hospital Equipment Loan System* practical exercise, as requested in the 2002 specification. A copy of the brief for this Practical Exercise has been included at the end of this paper if you need to refer to it.

Many of these questions require you to give the page number in your documentation, where the evidence for the answer may be found. Also you should write the number of the question in the margin of that page in your documentation.

At the end of the examination your documentation **must** be handed in with this question paper.

1 This question relates to the DESIGN process.

(a) You were told to devise a suitable item code for equipment to be loaned.

(i) Give a page number where there is a reference to this item code.

Page (1 mark)

(Write Q 1a in the margin, in the correct place, on that page.)

(ii) Explain how this item code identifies each piece of equipment individually, while also indicating what type of equipment it is.

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

(2 marks)

(b) (i) Give a page number where there is a reference to an item of equipment on loan to a patient.

Page (1 mark)

(Write Q 1b in the margin, in the correct place, on that page.)

(ii) Explain how your solution connects the piece of equipment with the patient borrowing it.

.....
.....

(1 mark)

(iii) How does your solution distinguish between two patients who may have the same name?

.....
.....

(1 mark)

2 This question relates to the DESIGN process.

(a) Give the page number where the fields relating to the item of equipment are described.

Page (1 mark)
(Write Q 2a in the margin, in the correct place, on that page.)

(b) Your solution needs to record some facts about each item of equipment. For each of the following, identify the field where this information is stored, state the data type chosen for this field, and give an example of typical data recorded.

(i) Whether an item of equipment was available, being repaired or out on loan

Field Name

Data type Typical data.....

(ii) If on loan, when it was due to be returned or the loan renewed

Field Name

Data type Typical data..... (4 marks)

3 This question relates to the TESTING process.

Describe **three** tests that you did to ensure that your solution works correctly. Your tests must test different parts of your solution.

(a) First test:

(i) Give the page reference giving evidence of this test.

Page (1 mark)
(Write Q 3a in the margin, in the correct place, on that page.)

(ii) What was the purpose of this test?

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

(iii) Test data used (1 mark)

5

QUESTION 3 CONTINUES ON THE NEXT PAGE

Turn over ►

(b) Second test:

- (i) Give the page reference giving evidence of this test.

Page (1 mark)
(Write Q 3b in the margin, in the correct place, on that page.)

- (ii) What was the purpose of this test?

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

- (iii) Test data used (1 mark)

(c) Third test:

- (i) Give the page reference giving evidence of this test.

Page (1 mark)
(Write Q 3c in the margin, in the correct place, on that page.)

- (ii) What was the purpose of this test?

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

- (iii) Test data used (1 mark)

4 This question relates to the IMPLEMENTATION process.

- (a) If a piece of equipment is being repaired, you need to find when it was sent for repair.

- (i) Where in your documentation is there evidence that your solution achieves this?

Page (1 mark)
(Write Q 4a in the margin, in the correct place, on that page.)

- (ii) By answering the following, explain how this is achieved in your solution.

- 1 What file, table or worksheet is referenced?

.....

- 2 What search criterion or filter is used?

.....

- 3 How is the required data retrieved for display?

.....

(3 marks)



(b) For a piece of equipment out on loan, you need to find the name and address of the borrower and when it is due for return or renewal.

(i) Where in your documentation is there evidence that your solution achieves this?

Page (1 mark)
(Write Q 4b in the margin, in the correct place, on that page.)

(ii) By answering the following, explain how this is achieved in your solution.

1 What file, table or worksheet is (are) referenced?

.....

2 What search criterion or filter is used to access the record of the item of equipment?

.....

3 How is the name and address of the borrower of that item found?

.....

.....

4 How is the date of return or renewal retrieved for display?

.....

.....

(4 marks)

(c) (i) What prevents the number available of a particular item of equipment becoming negative?

.....

.....

(ii) How does your solution ensure that one item of equipment is not logged as being in two places at once, e.g. booked out on loan while it is actually being repaired?

.....

.....

(2 marks)

5 This question relates to the USER INTERFACE in your design.

An Input Screen used to update the equipment loan details should be user friendly and should make inputting data easy and efficient.

State **three** criteria you would consider in the design of this screen and explain how each would be relevant to good user interface design. (If you did not have the facilities in your method of solution to meet these, give **three** criteria you would have liked to include.)

- 1 Criterion.....
Explanation.....
.....
- 2 Criterion.....
Explanation.....
.....
- 3 Criterion.....
Explanation.....
.....

(6 marks)

6 This question relates to the HUMAN COMPUTER INTERFACE.

Consider the weekly report on equipment.

- (a) (i) Explain how this report is produced.

.....

(3 marks)

- (ii) Give a page number of a hard copy of this report in your documentation.

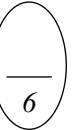
Page (1 mark)

(Write Q 6a in the margin, in the correct place, on that page.)

- (b) The manager of the Loans Department has now decided that she wants to know the total value of all items of equipment. Explain how this additional information could be produced automatically from your solution.

.....

(2 marks)



7 This question relates to the OUTPUTS.

If a piece of equipment is due for return or renewal, the patient has to be contacted. It is stated in the brief that ‘there is a standard letter for this’. The hospital could use a *mail merge* process for this.

- (a) List the steps that would be required to use mail merge to produce contact letters, (even if your solution does not support this).

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

(4 marks)

- (b) Explain **two** advantages of using mail merge in this situation over typing individual letters.

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

(2 marks)

8 This question relates to the ANALYSIS process.

When analysing the manual system, the analyst needed to gather information from a variety of sources. Suggest **two** different sources in the hospital and for each, suggest **one** method the analyst would use. Explain why that method would be appropriate to that source. Your two methods and your explanations must be different.

1 Source
Method.....
Why appropriate
2 Source
Method.....
Why appropriate

(6 marks)

6

6

Turn over ►

9 In this question, consider how you might EXTEND your solution.

The hospital's equipment replacement policy is to allow 2% of the cost of replacing an item of equipment for every 6 weeks that the item has been out on loan. When sufficient allowance has been made for a type of item, another one of that type can be ordered. You are asked if your system can report on how much has to be allowed for each item of equipment over the last twelve months.

By answering the following, explain how you would modify your system to achieve this.

(a) Give the field definitions (name, data type, validation rule if appropriate) of **three** fields that would be essential. (These could include both fields that you already have in your records and additional fields.) At least **one** validation rule must be suggested.

Field name	Data type	Validation rule
1		
2		
3		

(7 marks)

(b) How would these fields be used to calculate the allowance?

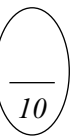
.....
.....

(2 marks)

(c) How would you present the output?

.....
.....

(1 mark)



END OF QUESTIONS

This question paper has been based on the Practical Exercise – Hospital Equipment Loan System – which was given in the 2002 Specification. A copy of this exercise is given below for reference purposes only.

AS Practical Exercise (CPT3) – Hospital Equipment Loan System

Background

One of the administrative tasks in a hospital is to keep a record of loans to patients of equipment such as wheelchairs and crutches. The patients borrowing the equipment may be still in hospital or they may have been discharged. Records have to be kept of what equipment has been borrowed, by whom and when, and also if any equipment is not available because it is being repaired.

You have been asked to create a computer application to replace the present manual one to record the necessary details to enable greater control to be kept and so cut down on loss and wastage.

Specification

1. Ability to store details of the equipment. For the purpose of this exercise, only the following items need be recorded, although in practice there would be many more.

Description of Item	Number in Stock	Cost of Replacement
Wheelchair – Junior	2	£275
Wheelchair – Small	2	£295
Wheelchair – Medium	3	£320
Wheelchair – Large	2	£350
Crutch – Junior	4	£75
Crutch – Adult	6	£95
Elbow Crutch – Junior	2	£85
Elbow Crutch – Adult	4	£105
Neck Collar – Junior	3	£17.50
Neck Collar – Adult	5	£23.75

2. A suitable Item Code is to be devised which identifies each piece of equipment individually, while also indicating what type of equipment it is.
3. The data which is recorded should be sufficient to find the following information for any individual piece of equipment:
 - whether it is available, being repaired or out on loan
 - if on loan, to whom and at what address or ward number
 - if on loan, when it is due to be returned or the loan renewed
 - if being repaired, when it was sent for repair.

Turn over ►

4. It may be necessary to produce a hard copy of this information for any piece of equipment.
5. Equipment is lent out for a 6-week period in the first place, but this loan can be renewed for periods of 6 weeks.
6. A patient may have more than one piece of equipment on loan at a particular time (e.g. 2 crutches and a wheelchair).
7. At any one time, about half the equipment will be out on loan and 1 or 2 pieces will be in for repair.
8. Names and addresses of patients are to be invented. Ward numbers are W1 – W10.
9. At the end of each week, a full report of the location of all equipment is to be produced. If equipment is due for return or renewal during the following week, that patient will be contacted. There is a standard letter for this purpose.

Test Plan

The test plan should cover all parts of the system, including checking that the number available cannot become negative, and that any one piece of equipment is not logged as being in two places at once.

Requirements for the Practical Exercise

Candidates are expected to design and implement an appropriate computing system and provide sufficient documentation to demonstrate the following practical skill.

- Design
- Implement / Test

Candidates are expected to produce brief documentation including some or all of the following, as appropriate.

Design

- definition of data requirements;
- user interface design including output, forms and reports;
- method of data entry, including validation;
- record structure, file organisation and processing;
- security and integrity of data;
- system design.

Implementation / Testing

- hard copy output to prove the correct working of the system;
- hard copy of solution, e.g. annotated program listing, spreadsheet showing formulae.

This documentation is to be brought to the examination and handed in with the candidate's answer script for Unit 3. A Cover Sheet, signed by the teacher and the candidate, authenticating the work of the candidate, must be attached to the documentation.

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE