

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

For Examiner's Use

General Certificate of Education
 June 2007
 Advanced Subsidiary Examination



COMPUTING
Unit 3 Practical Systems Development

CPT3

Wednesday 16 May 2007 9.00 am to 10.30 am

For this paper you must have:
 your completed Practical Exercise for CPT3.
 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.
- You are reminded of the need for good English and clear presentation in your answers.

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.

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

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

Answer this paper using the documentation you have prepared for the UKAB Examiner Payments practical exercise as requested in the 2007 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 where the evidence for the answer may be found in your documentation. You **must** write the question number and question part number 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) (i) Give the page reference where the data items to be recorded about individual examiners are defined.

Page (1 mark)

(Write Q1 (a)(i) in the margin, in the correct place, on that page)

- (ii) Give the page reference where the data items to be recorded about a centre's examination entries are defined.

Page (1 mark)

(Write Q1 (a)(ii) in the margin, in the correct place, on that page)

- (b) For each of the following data items in your solution, describe a different planned validation check.

	Validation Check
(i) Examiner number	
(ii) Number of candidates	
(iii) Centre number	

(6 marks)

(c) Explain your choice of data type for **each** of these four data items.

(i) Examiner number

Data type

Why?
(2 marks)

(ii) Tax deduction flag

Data type

Why?
(2 marks)

(iii) Payment per script

Data type

Why?
(2 marks)

(iv) Number of candidates

Data type

Why?
(2 marks)

Turn over for the next question

2 This question relates to the IMPLEMENTATION and OUTPUT processes.

- (a) (i) Give a page reference showing your **coding or equivalent instructions** that calculates an examiner’s payment.

Page (1 mark)

(Write Q2 (a)(i) in the margin, in the correct place, on that page)

- (ii) Explain how an examiner payment is calculated. Your explanation must include payments with and without tax deducted.

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(4 marks)

(b) You were told to produce, for each subject, a list of examiners and their centres.

- (i) Where is there a **hard copy** of such a list?

Page (1 mark)

(Write Q2 (b)(i) in the margin, in the correct place, on that page)

- (ii) The list for each subject was to be sorted by centre number within examiner name. Give the steps in your solution to complete this sort.

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(3 marks)

(c) You were told to produce a summary for all subjects showing the total number of candidates entered and the total payments made.

(i) Where in your documentation is your **coding or equivalent instructions** to calculate these totals?

Page (1 mark)

(Write Q2 (c)(i) in the margin, in the correct place, on that page)

(ii) Explain how your solution totalled up the payment for each subject.

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(3 marks)

(d) You were told to produce, for each examiner, a list of centres allocated showing centre number and number of scripts per centre.

(i) Where is there a **hard copy** of an examiner's list?

Page (1 mark)

(Write Q2 (d)(i) in the margin, in the correct place, on that page)

(ii) Give the steps in your solution to produce these lists.

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(3 marks)

Turn over for the next question

3 This question relates to the IMPLEMENTATION and TESTING process.

- (a) (i) Explain how your solution checks that a centre number is within the range 10000 to 79999.

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(2 marks)

- (ii) Give a page reference of a test to check that a centre number is within the range of 10000 to 79999.

Page

(1 mark)

(Write Q3 (a)(ii) in the margin, in the correct place, on that page)

- (b) You were asked to include test data for at least 20 centres and four examiners per subject.

- (i) Give a page reference showing an item of **normal** test data.

Page

(1 mark)

(Write Q3 (b)(i) in the margin, in the correct place, on that page)

- (ii) Explain what is meant by **normal** test data.

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(2 marks)

- (iii) Give a page reference showing an item of **erroneous** test data.

Page

(1 mark)

(Write Q3 (b)(iii) in the margin, in the correct place, on that page)

- (iv) Explain what is meant by **erroneous** test data.

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(2 marks)

(v) Give a page reference showing an item of **extreme/boundary** test data.

Page (1 mark)

(Write Q3 (b)(v) in the margin, in the correct place, on that page)

(vi) Explain what is meant by **extreme/boundary** test data.

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(2 marks)

12

Turn over for the next question

4 This question relates to the OUTPUT process.

- (a) (i) On which page of your documentation is a hard copy of a payslip **with** tax deducted?

Page (1 mark)

(Write Q4 (a)(i) in the margin, in the correct place, on that page)

- (ii) On which page of your documentation is a hard copy of a payslip **without** tax deducted?

Page (1 mark)

(Write Q4 (a)(ii) in the margin, in the correct place, on that page)

- (b) (i) Give **two** criteria that you have considered for the design of the presentation and layout of payslips. State how you have used each of them.

Criterion 1 (1 mark)

Use

..... (1 mark)

Criterion 2 (1 mark)

Use

..... (1 mark)

- (ii) Which page(s) of your documentation demonstrates these aspects of your design?

Criterion 1 Page (1 mark)

(Write Q4 (b)(ii) 1 in the margin, in the correct place, on that page)

Criterion 2 Page (1 mark)

(Write Q4 (b)(ii) 2 in the margin, in the correct place, on that page)

5 This question relates to the LEGAL use of computers.

The storage of examiners' details is regulated by legislation. Name the legislation and state why it is required.

Legislation

Why required

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(2 marks)

2

6 This question relates to the HARDWARE for the computer system.

Name **two** types of printer that could be used to print the examiners' payslips. Explain which printer you would choose and the reason for your choice.

Printer 1

Printer 2

Choice of printer

Reason

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(4 marks)

4

Turn over for the next question

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

- (a) After discussions with the Inland Revenue, the exam board has decided that some examiners should have tax deducted at 40% on their payments.

Explain how you would modify your solution to allow deductions for **two** different rates of tax as well as no tax deduction.

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(3 marks)

- (b) The exam board systems are fully documented. Give **three** items of documentation that would need to be altered once the above changes have been implemented.

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3

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(3 marks)

END OF QUESTIONS

6

This question paper has been based on the Practical Exercise – UKAB Examiner Payments – which was given in the 2007 specification. A copy of this exercise is given below for reference purposes only.

AS Practical Exercise (CPT3) – UKAB Examiner Payments

Background

The (imaginary) United Kingdom Awarding Body (UKAB) has asked you to create a computer application, **either programmed or using a relational database or using a combination of both**, to calculate the payments made to its examiners for marking scripts.

Scripts are marked during a short period of time, approximately 4 weeks, during May and June. One payment is made to each examiner at the end of the marking period.

The system described in the following specification has been considerably simplified; for example, each subject in this exercise consists of only one paper.

Specification 1.

For each examiner, the following details are stored:

- Examiner name
- Examiner number
- Examiner address
- Subject reference code
- Tax deduction flag

Each examiner is allowed to mark only one subject and is paid a fixed fee of £95.00 for preparation and administration plus a fee for each script marked.

Tax at 22% is deducted from any payments made to examiners unless a low-income declaration has been received; in this case no tax is deducted.

You may assume that no candidate drops out of a subject once entered and there will be no late entries.

2. Each centre is allocated one examiner per subject to mark the scripts. For each centre for which candidates are entered for a subject examination the following details need to be stored.

- Centre Number
- Subject reference code
- Examiner number
- Number of candidates entered

Centres can enter candidates for many subjects. An examiner will usually mark scripts from several centres.

3. For each subject the following details are stored.

- Subject reference code
- Payment for marking each script

For the purpose of this exercise, only the following subjects need to be considered.

Subject Reference Code	Payment
20094	£4.52
28181	£3.75
64773	£7.88

4. The solution must produce a hard copy of the following.

- For each examiner, a list of centres allocated showing centre number and number of scripts per centre.
- For each examiner, a payslip showing administration payment, number of scripts marked, script rate, gross payment, net payment and tax deducted.
- For each subject, a list of centres with number of candidates entered and the total number of candidates.
- For each subject, a list of examiners and their centres sorted by centre number within examiner name.
- A summary for all subjects showing the total number of candidates entered and the total payments made.

5. Test data for at least 20 centres and four examiners per subject. Examiners should have at least 200 scripts allocated. Some examiners should have completed a low income declaration and have no income tax deducted on their payslip.

6. (i) Examiner numbers are 6 digits and unique.
(ii) Centre numbers are allocated within the range 10000 to 79999 and are unique.
(iii) Subject reference codes are 5 digits and unique.

Requirements of the Practical Exercise

Candidates will need to design and implement an appropriate computing system and provide sufficient documentation to demonstrate the following practical skills:

- Design
- Implement/Test.

The task may be undertaken by:

either writing a program in a chosen high level language

or using a suitable relational database

or using a combination of both.

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
- E-R diagram, table designs, queries
- Record structure, file organisation and processing
- Security and integrity of data
- System design.

Implementation/Testing

- Details of a test plan with explanation, and evidence of testing having been carried out
- Hard copy output to prove the correct working of the system
- Hard copy of the solution, e.g. annotated program listings or annotated copies of database tables, forms, reports, queries etc. in design view. A hard copy is primary output from the candidate's system. This can be inserted into a word-processed document for the purpose of adding page numbers and headers/footers.

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