Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

General Certificate of Education
Summer 2003
Advanced Subsidiary Examination

AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

COMPUTING   **CPT3**
Unit 3   Practical Systems Development

Monday 12 May 2003 Afternoon Session

In addition to this paper you will require:
     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 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 you have prepared for the UKAB Re-marks practical exercise as requested in the 2003 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. You should write the number of the question in the margin of that page in your documentation.

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

1 This question relates to the DESIGN process.

(a) List **two** extra data items that you have stored for the re-mark records (holding candidate name and number, centre number, subject code, etc.).

(i) First extra data item. ....

Where in your documentation have you defined or set up this data item?

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

How have you used this data item?

....
(2 marks)

(ii) Second extra data item ....

Where in your documentation is there evidence of this data item being used?

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

How have you used this data item?

....
(2 marks)

(b)   State what data type you have used for each of the following items, and explain your choice in each case. (Be as specific as possible when giving the data type.)

   (i)   Candidate Number

      Data type ....

      Why? ....

   (ii)   Whether scripts are to be returned to the Centre

      Data type ....

      Why? ....

   (iii)   Original mark

      Data type ....

      Why? ....

(6 marks)

12
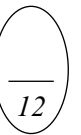
TURN OVER FOR THE NEXT QUESTION

Turn over ▶

2 This question relates to the IMPLEMENTATION process.

(a) In order to produce the requested hard copy lists, your solution has to find certain records. Exactly how did your solution find:

(i) records where re-marks have been requested for a particular subject;

....

....
(2 marks)

Where in your documentation is your coding to find this data?

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

(ii) records where the candidate's mark has changed causing a change in grade;

....

....
(2 marks)

Where is a hard copy of such a list in your documentation?

Page number ....
(1 mark)

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

(iii) records where re-marks have not been completed in the required three-week period?

....

....

....
(3 marks)

Give the page number **either** of the coding to produce this list **or** a hard copy of this list in your documentation.

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

(b) You were asked to produce a daily list of those re-marks where the candidate's grade has been affected by a mark change. UKAB decides it also needs a daily list of those re-marks where the grade has not been changed, whether or not the mark had been changed.

Write an algorithm to produce this list.

(5 marks)

15

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

3   This question relates to the REPORT DESIGN process.

(a)   (i)   On which page of your documentation is a hard copy of the document to be returned to centres, complete with UKAB logo?

Page number ....

(1 mark)

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

(ii)   How did you input the logo and position it on this document?

....

....

....

....

....

(3 marks)

(b)   Give **two** criteria that you have considered for the design of this document, other than using the logo, and say how you have used each of them.

1 ....

....

2 ....

....

(4 marks)

(Write Q 3(b) in the margin of your document, in the correct place(s) on the page(s), where these two aspects of design are demonstrated.)

(2 marks)

10

4 This question relates to the TESTING and VALIDATION process.

(a) How did your solution prevent the entry of a mark greater than 100?

....

....
(1 mark)

(b) How did you ensure that your solution would allow two candidates with the same candidate number but from different centres?

....

....

....
(2 marks)

Where is this made clear in your documentation?

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

(c) What test data did you use for a candidate's mark being

(i) increased; ....

(ii) decreased? ....
(2 marks)

Where is the evidence of this testing in your documentation?

Page number .... And ....
(2 marks)
(Write Q 4(c)(i) and 4 (c)(ii) in the margin, in the correct places, on those pages.)

8

Turn over ▶

5 This question relates to the ANALYSIS process.

(a) Candidate, Centre and Subject are three entities in this system. Draw the Entity Relationship diagrams between:

(i) Candidate and Centre

(ii) Candidate and Subject

(iii) Centre and Subject.

(3 marks)

(b) The analysis of this problem has already been carried out. How might the systems analyst have found out **each** of the following and from what data source? (Your two methods and two sources should be different.)

(i) The reports which were required from the system, and how frequently they need to be produced?

....

....

(ii) The volume of data the system would have had to deal with?

....

....

(4 marks)

7

6 This question relates to the INTEGRITY and SECURITY of data in your solution.

(a) Clearly it is essential for your data to be accurate. Describe **one** technique which might be followed to improve accuracy on data entry.

....

....

(2 marks)

(b) It is also essential to keep your data secure against unauthorised access. The data files could be password protected with strictly defined access rights. Describe **two** other techniques which might be followed to improve data security.

1 ....

....

2 ....

....

(4 marks)

6

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

7 This question relates to the EVALUATION and MAINTENANCE of your new system.

(a) After your system has been running for a short time, it should be evaluated. Give **three** factors which could be looked at in this evaluation.

1 ....

2 ....

3 ....

(3 marks)

(b) (i) Suggest **one** reason why your system may need maintenance in the future.

....

(1 mark)

(ii) Give **three** items of documentation which would be necessary for effective maintenance of your system. These may be items you have not included in your documentation for this practical exercise.

1 ....

2 ....

3 ....

(3 marks)

7

END OF QUESTIONS

This question paper has been based on The Practical Exercise – UKAB Re-marks – which was given in the 2003 specification. A copy of this exercise is given below for reference purposes only.

AS Practical Exercise   (CPT3) – UKAB Re-marks

Background

The (imaginary) United Kingdom Awarding Body (UKAB) has asked you to design a system for the monitoring of its post-examination re-marks.

If a centre feels that the grade awarded to a candidate for an examination is much lower than expected, the centre can ask for that script to be re-marked. The UKAB expects all re-marks to be completed within three weeks.

The system described in the following specification has been considerably simplified. For example, few subject examinations consist of only one paper. In reality, many details are stored for the purpose of analysis and monitoring.

Specification

1. For any script for which a re-mark is requested, the following details to be stored.

    *   Candidate name

    *   Candidate number

    *   Centre number

    *   Subject Reference Code

    *   Original mark

    *   Re-mark mark (whether changed or unchanged)

    *   Whether the centre requested the return of the script.

    You will find it necessary to store other details.

2. For a subject, the following details to be stored.

    *   Subject Reference Code

    *   Grade boundaries for grades A – E and U

Turn over ▶

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

	Grade Boundaries (%)				
Subject Reference Code	**A**	**B**	**C**	**D**	**E**
01325	75	67	60	54	48
20094	70	60	50	40	30
28181	90	78	66	54	42
54821	85	79	74	64	55
64773	68	60	52	46	40

3.   The solution must be able to produce a hard copy of the following:

   • a daily list of any re-marks completed where a mark change has affected the grade;

   • a daily list of any re-marks still outstanding, i.e. that have not been completed within a three-week period;

   • a list of re-marks that have been requested for a particular subject;

   • a list of re-marks that have been requested from a particular centre.

4.   The solution must produce a document to be returned to the centre giving the results of the re-mark. This document should display the UKAB logo. The following details should be included in this document.

   • Centre number

   • Candidate name

   • Candidate number

   • Subject Reference Code

   • Original mark

   • Original grade

   • Either the re-mark mark and grade, if changed, or a sentence to say that there has been no change.

5. Test data for at least 15 candidates from 4 centres and the subjects listed above should cover situations in which marks are both increased and decreased.

6.(i) Candidate numbers are of 4 digits and will be unique within any centre, but not between centres. The solution should ensure that this is allowed for.

(ii) Centre numbers are allocated within the range 10000 to 80000 and are unique.

(iii) Subject Reference Codes are 5 numeric digits.

Requirements of the Practical Exercise

Candidates are expected 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 application package.

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, appropriate listings from a database

This documentation is to be brought to the examination and handed in with the candidate's answer script for Unit 3 (CPT3) at the end of the examination. A Cover Sheet, signed by the teacher and the candidate, authenticating the work of the candidate, must be attached to the documentation.