COMPUTER STUDIES

Paper 7010/01

Written Paper

General comments

The performance of the candidates was similar to that of previous years. There was a wide spread of marks with some of the candidates scoring very well. Majority of the candidates answered all of the questions. There were a few very poor scripts.

A number of candidates lost marks throughout the paper by failing to meet the demands of the rubric, for example:

(i) describing general features of an operating system rather than file management,

(ii) stating advantages of online banking for the customer rather than for the bank,

(iii) describing features of a batch processing system rather than giving reasons as to why batch processing is appropriate for the production of electricity bills.

The algorithm question was particularly well done this year. Candidates that used the case structure or a flowchart obtained full marks easily.

Centres must ensure that all of their candidates write their Centre number, Candidate number and name clearly and legibly on all the work they hand in.

Comments on specific questions

Question 1

This question was answered quite well with most of the candidates gaining at least half of the available marks. Some of the candidates gave definitions that contained insufficient detail or did not give examples where appropriate.

(a) There were many confused definitions of a smart card nevertheless most of the candidates gained one mark for an example such as a credit card.

(b) Many candidates gained one mark for 'tables' but failed to explain 'links' or give examples. Candidates that rephrased the question were not awarded any marks.

(c) RAM and ROM were often confused, or a complete definition of ROM was not given. Examples of the use of ROM given included CD/DVD's, the bootstrap loader and the BIOS stored on ROM.

(d) A clear understanding of de-skilling was shown. Examples from manufacturing and office work were given.

(e) Top-down design was well understood.

Question 2

Almost all of the candidates had a good knowledge of digital phones. A wide range of acceptable mobile phone features was given and many candidates gained both of the available marks. Weaker candidates tended to focus on screens and telephone calls.

Question 3

(a) This question was generally well answered. A few candidates gave an answer, such as 'invasion of privacy', which was too vague for a mark to be awarded. Acceptable answers included fraud and blackmail.

(b) Most of the candidates gained at least one mark. The correct answers given included password and firewall.

Question 4

Very many candidates did not read the question carefully enough and consequently gave general tasks of an operating system rather than file management tasks. Popular correct answers included file security, sorting and loading/saving files.

Question 5

(a) Multimedia and the use of the Internet were the acceptable responses given by the majority of the candidates. A significant number of candidates had difficulty in providing a suitable second answer. Many candidates gave a generic, such as computer-aided learning (CAL) or computer-based training (CBT), without giving sufficient detail for a mark to be award.

(b) E-mail and FAX were the correct answers given by almost all of the candidates.

Question 6

(a) Two correct benefits of using a high-level language for writing programs were usually given, the most popular being that a high-level language is easy to understand as it is similar to English and that correcting errors is easier.

(b) This question was not well answered, in particular the reason. General answers that were too vague for a mark to be awarded were given e.g. 'a program that needs to be written in a low level language'. Programs that would be written in a low level language rather than a high-level language are an operating system, a device driver and a game and two suitable reasons are that fast execution/response is needed and that each assembly language statement generally translates into one machine code instruction.

Question 7

(a) Many candidates did not correctly identify a cell that contained a data item. A popular correct answer was B7.

(b) A variety of partially correct formatting methods were described most of which could only be awarded one mark.

(c) Majority of the candidates answered this question correctly. A common error was to omit the brackets in the formula.

(d) Usually answered correctly. Weaker candidates gave an incorrect formula e.g. B7 ÷ 2 or B7 x ½. The correct formula was B7/2 or B7*0.5.

(e) Most of the candidates gained one mark for stating the cells C10:E10, but could not be awarded the second mark as they wrote down B13 instead of B13:E13.

(f) Shading the spreadsheet generally gained one mark.

Question 8

Many candidates described a feedback system instead of a data logging system.

(a) A correct answer was an oxygen sensor. Weaker candidates gave an incorrect sensor such as a pressure sensor or a light sensor.

(b) Majority of the candidates gained one mark for reference to an analogue-to-digital converter (ADC). A second mark was given for knowing that the stored data was compared with set parameters.

(c) A graph/chart or a database/table was the common acceptable answer given. Many candidates gave incorrect answers such as 'on a screen' and 'printout'.

(d) The data-logging system only monitors the oxygen levels. Weaker candidates confused monitoring and control and consequently described how the system controlled the oxygen levels and lost marks accordingly. An acceptable answer is 'sound an alarm'.

(e) Generally well answered. Correct answers seen included the fact that accurate measurements are made and that the readings are taken automatically.

Question 9

(a) Most of the candidates gave the correct answer 1.

(b) Weaker candidates were awarded one mark for 10, 5. They did not gain the second mark as they could not cope with the loop. The correct answer is 10, 5, 16, 8, 4, 2, and 1.

Question 10

(a) Very many candidates answered this question incorrectly; they ignored the word 'bank' in the question and gave advantages for the 'customer'. Correct answers included less staff required and new international customers.

(b) Most of the candidates gained one mark for either hacking or fraud.

(c) Only the better candidates knew the data protection rules. Weaker candidates confused data protection with systems protection.

Question 11

This question was answered reasonably well with stock 'text book' answers.

(a) Usually answered correctly.

(b) Most of the candidates gained one mark for cost/cost-benefit analysis.

(c) Many of the candidates clearly did not understand that design is not the same as implementation. Consequently the incorrect answers given included implementation and testing.

(d) Generally well answered. The popular correct answers were parallel and direct changeover.

Question 12

(a) Very few candidates were awarded more than one or two marks. Most of the candidates gave incorrect field lengths and validation checks. The data type given for the date of birth was usually incorrect.

(b) Almost all of the candidates showed a good knowledge of web page design. Missing fields and insufficient space for data were the main reasons for a marks not being awarded.

(c) This question was badly answered. Many of the candidates just explained or used the word unique without saying why the reference number needed to be unique.

(d) Weaker candidates confused amending with deleting and lost marks accordingly.

(e) Almost all of the candidates gave the correct answer random/direct file access.

Question 13

(a) Quite a few candidates answered this question incorrectly, they either explained what an expert is, or described how one is made. The question required answers relating searching, not creating, an expert system. The candidates that had read the question carefully answered the question competently.

(b) Medical diagnosis was the correct example given by most of the candidates. Very few candidates gained the second mark which was awarded for another application that uses an expert system, for example mineral prospecting.

Question 14

(a) Batch processing was, in generally, well understood. The most common error was to give a definition of batch processing instead of the reasons why batch processing rather than real-time processing is used for producing electricity bills.

(b) Generally well answered. Candidates that had a good understanding of systems flowcharts gained full marks easily. Other candidates confused 'process' with 'output' and lost marks accordingly.

(c) Very few candidates understood the process of running an old master file with a transaction file in order to regenerate a master file. Most of the candidates were awarded one mark for mentioning file generations or backup.

Question 15

(a) Features of computer-aided design (CAD) software were not well known. Candidates usually gave two features from 3D views, colour, volume, zoom, simulation and accurate measurements.

(b) The only benefit seen was the fact that stored drawings could be modified. Other answers that could have been given included the consistency of the product and the fact that that product changes could be made quickly and inexpensively.

Question 16

(a) Nearly all of the candidates gained the mark for this question. The correct answer is 20.

(b) Almost all of the candidates attempted the algorithm question and quite a few gained the maximum mark. The candidates that chose to use the CASE statement rather than the IF statement tended to gain more marks. Candidates in general had problems with loop, the calculation of the BMI and the If statement for the BMI between 25 and 19 (inclusive). Some of the candidates confused the less than (<) and the greater than (>) symbols.

A correct algorithm is:

```
count = 0
while count < 31 do
        input id, weight, height
        bmi = weight/height * height
        if bmi > 25 then print "overweight", "id", "bmi"
        if bmi < 19 then print "underweight", "id", "bmi"
        else print "normal", "id", "bmi"
        count = count + 1
endwhile
```

COMPUTER STUDIES

Paper 7010/02

Project

The quality of work was of a slightly higher standard than last year. There were fewer inappropriate projects, which provided limited opportunities for development and therefore did not qualify for one of the higher grades. Such projects include word-processing/DTP projects of a theoretical nature.

The majority of Centres assessed the projects accurately according to the assessment headings. In some instances marks are awarded by the Centre where there is no written evidence in the documentation. **Marks can only be awarded where there is written proof in the documentation.** It is important to realise that the project should enable the candidate to use a computer to solve a significant problem, be fully documented and contain some sample output that matches their test plans. A significant number of Centres failed to provide the correct documentation for external moderation purposes. Firstly, the syllabus requires a set number of projects to be provided as a sample, full details can be found in the syllabus. A number of Centres still send the work for all candidates, this is only required where the number of candidates is ten or less.

However the standard of presentation and the structure of the documentation continue to improve. Many candidates structure their documentation around the broad headings of the assessment scheme, and this is to be commended. Candidates might find it useful to structure their documentation using the following framework. Many of the sections correspond on a one-to-one basis exactly to the assessment headings, some combine assessment headings and some carry no marks but form part of a logical sequence of documentation.

Suggested framework for Documentation of the Project

ANALYSIS

- Description of the problem
- List of Objectives *(in computer-related terms or computer processes)*
- Description of Existing Solution and business objectives
- Evaluation of Existing Solution
- Description of Other Possible Solutions
- Evaluation of Other Possible Solution

DESIGN

- Action Plan *(including a time scale or Gantt chart)*
- Hardware Requirements
- Software Requirements

IMPLEMENTATION

- Method of Solution *(related to the individual problem, including any algorithms, flowcharts, top down designs or pseudo-code.)*

TESTING

Test strategy/plans	Normal data *(including the expected results and the objective to be tested.)*
	Extreme data *(including the expected results and the objective to be tested.)*
	Abnormal data *(including the expected results and the objective to be tested.)*
Test Results	Normal data *(including the objective to be tested.)*
	Extreme data (*including the objective to be tested.)*
	Abnormal data *(including the objective to be tested.)*

DOCUMENTATION

Technical Documentation

User Documentation/User Guide

SYSTEM EVALUATION AND DEVELOPMENT

Evaluation	*(must be based on actual results/output which can be assessed from the written report and referenced to the original objectives)*

Future Development/Improvements

The assessment forms for use by Centres should not allow for a deduction for the trivial nature of any project. One of the Moderator's roles is to make such a deduction. Therefore if the Centre thinks that a deduction should be made in this section then that particular project **must** be included in the sample. When there is more than one teacher involved in assessing the projects, internal moderation is required within the Centre. Centres should note that the project work should contain an individual mark sheet for every candidate and one or more summary mark sheets, depending on the size of entry. It is recommended that the Centre retain a copy of the summary mark sheet(s) in case this is required by the Moderator. In addition the MS1 mark sheet should be sent to CIE by separate means. Although the syllabus states that disks should not be sent with the projects, it is advisable for Centres to make back up copies of the documentation and retain such copies until after the results query deadlines. Although disks or CDs should not be submitted with the coursework, the Moderators reserve the right to send for any available electronic version. Centres should note that on occasions coursework might be retained for archival purposes.

The standard of marking is generally of a consistent nature and of an acceptable standard. However there are a few Centres where there was a significant variation from the prescribed standard, mainly for the reasons previously outlined. **It is recommended that when marking the project, teachers indicate in the appropriate place where credit is being awarded, e.g. by writing in the margin 2,7 when awarding two marks for sections seven.**

Areas of relative weakness in candidate's documentation include setting objectives, hardware, algorithms, testing and a lack of references back to the original objectives. Centres should note that marks could only be awarded when there is clear evidence in the documentation. A possible exception would be in the case of a computer control project where it would be inappropriate to have hard copy evidence of any testing strategy. In this case it is perfectly acceptable for the teacher to certify copies of screen dumps or photographs to prove that testing has taken place.

The mark a candidate can achieve is often linked to the problem definition. The candidates need to describe in detail the problem and where this is done correctly it enables the candidate to score highly on many other sections. This is an area for improvement by many candidates. If the objectives are clearly stated in computer terms then a testing strategy and the subsequent evaluation should follow on naturally, e.g. print a membership list, perform certain calculations etc. Candidates should note that they should limit the number of objectives for their particular problem; it is inadvisable to set more than 7 or 8 objectives. If candidates set themselves too many objectives then they may not be able to achieve all of them and this prevents them from scoring full marks.

There was evidence that some candidates appeared to be using a textbook to describe certain aspects of the documentation. Some candidates did not attempt to write this section of the documentation with specific reference to their own problem. It is important to note that candidates write their own documentation to reflect the individuality of their problem and that group projects are not allowed. Where the work of many candidates from the same Centre is identical in one or more sections then the marks for these sections will be reduced to zero, for all candidates, by the Moderators. Centres are reminded of the fact that they should supervise the candidate's work and that the candidate verifies that the project is their own work.

The hardware section often lacked sufficient detail where full marks are scored by a full technical specification of the required minimum hardware together with reasons why such hardware is needed by the candidate's solution to his/her problem.

Often the algorithms were poorly described and rarely annotated. Candidates often produce pages and pages of computer generated algorithms without any annotation; in these cases it is essential that the algorithms be annotated in someway in order to show that the candidates understand their algorithm. Candidates should ensure that any algorithm is independent of any programming language and that another user could solve the problem by any appropriate method, either programming or using a software application. If a candidate uses a spreadsheet to solve their problem then full details of the formulae and any macros should be included.

Many candidates did not produce test plans by which the success of their project could be evaluated. It is vital that candidates include in their test strategy the expected result. This is the only way in which the actual results can be judged to be successful. **If these expected results are missing then the candidate will automatically score no marks in the evaluation section**. The test results should include output both before and after any test data; such printouts should be clearly labelled and linked to the test plans. This will make it easy to evaluate the success or failure of the project in achieving its' objectives. Such results must be obtained by actually running the software and not the result of word-processing. The increasing sophistication of software is such that it can sometimes be difficult to establish if the results are genuine outputs which have been 'cut and pasted' or simply a word-processed list of what the candidate expects the output to be. Candidates need to ensure that their documentation clearly shows that the output is the result of actually using the proposed system. The use of screen dumps to illustrate the actual sample runs provides all the necessary evidence, especially in the case of abnormal data where the error message can be included.

An increasing number of candidates are designing websites as their project. Candidates must include site layout and page links in their documentation. The better candidates should include external links and possibly a facility for the user to leave an e-mail for the webmaster; in this case the work would qualify for the marks in the modules section.