COMPUTER STUDIES

GCE Ordinary Level

Paper 7010/01

Paper 1

General comments

Overall, the standard of candidates this November was lower than in the June 2001 examination. However, generally the English was of a higher standard, although many candidates are still loathe to qualify statements and answers such as *quicker*, *cheaper*, *more efficient*, etc. are still being offered – such answers are awarded zero marks. There is also evidence that some Centres are concentrating only on certain parts of the syllabus at the expense of a more balanced approach to the subject.

It also needs pointing out that a couple of Centres allowed candidates to attach supplementary answer sheets using metal staples. This is a dangerous practice and should be stopped forthwith. Any supplementary sheets should be attached using string with a loop large enough to allow Examiners to turn over the pages without tearing the candidates' work.

Comments on specific questions

Question 1

(a) Some candidates still regarded a robot as being a set of traffic lights. The question was reasonably well answered overall, but many candidates often failed to include the involvement of the microprocessor or computer. The most common example given was robots used in the car assembly industry.

(b) This part was badly answered, with too many candidates taking on-line to be literal and used the Internet as their example. Also, many candidates confused the terminology with real-time processing. The question was looking for answers such as interaction, under the control of the CPU, etc., with examples such as airline ticket booking, cash points, point of sale terminals (POS), etc.

(c) This part was well answered, with most candidates understanding the concept of a temporary memory with the use of printer buffers being the most common example given.

(d) Most candidates understood that a modem was used to convert computer signals into a form which could be sent down telephone cables (and vice versa).

(e) This part was not particularly well answered. Flight simulators used to train pilots was the most common correct example given. Quite a significant number referred to virtual reality systems which was not what the question was asking for.

Question 2

Most candidates referred to cost and time scale problems but the answers given were not explicit enough to gain any marks. Many claimed electricity failures and software crashes were the main problems, but these are surmountable problems using UPS, back up disks, etc., so gained no marks. The most common correct answer was to refer to unemployment problems but very few were able to come up with four different answers beyond loss of jobs and cost considerations. Many candidates referred to training but failed to mention that this would be expensive or very time consuming. On its own, training is not a problem!

Question 3

This question was fairly well answered with microwave ovens, washing machines and television sets being the most common household appliances used as examples. The reasons why microprocessors were used in the examples given were often sketchy in the case of the poorer candidates. As in the past, incorrect examples such as computers, calculators and air conditioning units were given by some candidates.

Question 4

(a) Most candidates understood that a virus was a piece of software/program but a surprising number did not actually specifically know the impact of a virus on a computer system. General answers such as 'they destroy the computer' were very common. The better candidates referred to the self-replication of viruses and their affect on files and data.

(b) The use of anti-virus software was the most common response, with most of the better candidates also referring to firewalls. Many weaker candidates still mentioned the use of back-ups, passwords, etc., which would not reduce the effect of a virus on their own.

Question 5

(a) This part was generally badly answered, with the majority of candidates scoring low marks. Many candidates thought the question concerned 'commercially written' versus 'purpose built' systems and referred to the involvement of systems analysts! The usual number of '*faster, cheaper, better*' answers were given but the better candidates mentioned less training needed, easier to import/export files, etc. There was little evidence that the common features and subsequent benefits of integrated packages were known by the majority of candidates.

(b) There was very little understanding of what a macro is and how it could be used to customise a package. The only mark gained by any candidate was for referring to the fact that a number of key presses/instructions could be replaced by 1 single key press/function key.

Question 6

(a) This part was poorly answered. Many candidates thought the question referred to drawing/graphics software and many gave a description of a graphical user interface (GUI) and not its purpose as required in the question.

(b) Most candidates gained 1 mark for mentioning that GUI removes the need to remember commands.

Most weaker candidates gained 1 mark here. The better candidates did quite well, with answers correctly referring to tasks such file management, memory management, security aspects, scheduling and input/output management.

Question 7

Generally, this question was not well answered. A large number of candidates failed to realise the question was referring to installation of software and not simply to the general advantages of using CDs such as large memory capacity, etc. Very few candidates indicated, for example, that CDs were used since this would remove the need to constantly change disks during software installation as would happen when floppy disks were being used.

Question 8

(a) This part was fairly well answered, with the most common answers being sound/audio, video/ movies and charts/graphs. Common errors were to suggest on-line chats with experts, scientists, etc.

(b) Many candidates gained 1 mark for answers such as copy and paste, obtain a print out, etc. but several candidates gave very general answers such as download information (to what?), retrieve data, import data, etc. Some candidates even suggested altering information so it could be passed off as their own work!

(c) This part was badly answered, with a large number of candidates confusing check sums with check digits. One or two candidates also thought check sums were used as a validation check on data **before** it was transmitted.

Question 9

(a) Most candidates seemed to understand the term 'feasibility study' but had little idea of **why** it was needed. Many gained 1 mark for cost effectiveness, the idea of time scales or to help make a final decision.

(b) Very few candidates seemed to understand what this part was asking for. A large number ignored the fact that a manual system was being used and gave answers which referred to databases, spreadsheets, etc. Quite a few also referred to a library system or ticket booking system. There was also little evidence that candidates knew how to produce data flow diagrams.

(c) This part was surprisingly badly answered, with little evidence that Centres had covered this topic. The question was looking for typical answers such as: *easier to debug*, *easier to modify/upgrade*, *several programmers could work on the software*, etc.

Question 10

(a) This part was generally well answered. However, some candidates gave the wrong output for input value of 99. The common error was to give *distinction* rather than the expected answer of *not a valid mark*.

(b) This part was very badly answered, with only a handful of candidates realising that the input mark needed to be divided first by 10 and then find the whole number part of the division. A simple answer such as *mark = mark DIV 10* would have gained both marks. The most common error was to multiply the mark by 10!

Question 11

(a) This part was well answered by the majority of candidates, with many gaining full marks.

(b)(i) The word *traffic* caused some confusion, with a number of candidates referring to car traffic jams! One or two candidates suggested that the problem could be solved by running the transaction file with a back up of the master file! The most common correct responses referred to possible air crashes, flight delays and angry passengers.

(ii) Delays in payment of wages and possible errors in wages were the most common responses.

Question 12

This was a well answered question, with a large number of candidates gaining 8 or more marks. The only real problem occurred in part **(e)**, where it was quite common to see only column F shaded. Candidates knowledge of spreadsheets was well demonstrated.

Question 13

(a)(b) These parts were very well answered by the majority of candidates.

(c) A large number of candidates failed to understand the need for the use of a key field (e.g. reference number) in the customer file and often simply gave customer name as the answer.

(d) This part was generally no problem. However, roughly a quarter of the candidates gave the numbers in *ascending order* rather than descending order as requested or simply listed **all** the database items in ascending/descending order.

(e) This part was not as well answered as expected. Accepted validation checks were: *length check*, *type check*, *format check*, etc. Not accepted were: *range checks*, *check digits*, *check sums*. The usual confusion between validation and verification was in evidence again this year.

Question 14

(a) This part was not particularly well answered, with many candidates thinking that the *users* were the ones to benefit from having a variety of programming languages.

(b) Very few good answers were seen in this part. Only one or two candidates realised that there was still sometimes a need to manipulate bytes/memory locations directly or that such languages often help understand computer architecture.

(c) This part was badly answered, with little understanding of how the two programming constructs worked. It was common to receive very general, vague answers such as *repeat something until some condition is met* **or** *if a condition is true then do something else do something else then end.* Very few candidates gave one example which showing how both constructs worked – the two examples given were usually unconnected.

Question 15

A reasonable range of marks came out of this question, although again, the concept of feedback was not well known. Many candidates just mentioned sensors with no explanation of what they were measuring – thermometers were often given rather than a temperature sensor. Many answers were very general such as *the computer will then control the temperature* (how?), *the sensor will control the water level in the tank*, *the fish tank owner will be notified if the temperature was too low or too high*, etc.

Question 16

Many candidates simply re-wrote the question in a type of algorithmic language, e.g. the question was split up into numbered sentences with the occasional *if … then … else* thrown in for good measure. Very few real algorithms/pseudo code were offered. Only a handful of candidates realised to best way to tackle the question was by way of a flow chart/diagram.

Paper 7010/02

Project

General comments

The quality of work was of a similar standard to previous years. The number of inappropriate projects which provided limited opportunities for development and therefore did not qualify for one of the higher grades was fewer than previous but still included word-processing/DTP projects of a theoretical nature.

The majority of Centres assessed the projects accurately according to the assessment headings. Overall the standard of assessment by Teachers is improving and we are recommending fewer changes than in previous years. *Marks can only be awarded where there is written proof in the documentation.* In some instances marks are awarded by the Centre where there is no written evidence in the documentation. Centres should note that assessment of the project can only be by reference to the criteria in the syllabus and that Centres must not devise their own mark schemes. Compared to previous years there were more Centres awarding half marks which is not allowed by the syllabus.

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 substantial sample output from their proposed system. Testing should include full test plans with expected results which can then be compared with the actual results and we would also expect to see labelled printouts which clearly match the test plans. Some projects do not demonstrate that they have actually been run on a computer. Software advances and the use of 'cut & paste' can give the impression that the results have simply been word-processed. It is recommended that candidates make use of appropriate screen dumps and include these in their documentation to show that there has been use of a computer.

However the standard of presentation and the structure of the documentation continues to improve. Many candidates structure their documentation around the broad headings of the assessment scheme, and this is to be commended. For those candidates who do not devise any structure they might find it useful to use 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
- Evaluation of Existing Solution
- Description of Other Possible Solutions
- Evaluation of Other Possible Solution

DESIGN
- Plan *(including a time scale)*
- Method of Solution including the algorithms
- System Requirements (Hardware)
- 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
	Extreme data
	Abnormal data
Test Results	Normal data
	Extreme data
	Abnormal data

DOCUMENTATION
- Technical Documentation and System Maintenance
- User Documentation/User Guide

SYSTEM EVALUATION & DEVELOPMENT
- Evaluation *(must be based on actual results/output which can be assessed from the written report)*
- Future Development/Improvements

The assessment forms for use by Centres should not allow for a deduction in section 23 for the trivial nature of any project. Centres should not make any deduction in this section. One of the Moderator's roles is to make such a deduction. Therefore if the Centre think that a deduction should be made in this section then that particular project must be included in the sample. 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 marksheet(s) in case this is required by the Moderator. In addition the MS1 mark sheet should be sent to Cambridge International Examinations by separate means. It was pleasing to note that the vast majority of the coursework was received by the due date. It causes some considerable problems in the moderation process where Centres fail to meet this deadline. 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 the electronic version. Centres should note that on occasions coursework may 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 section seven.

Areas of relative weakness in candidates' documentation include setting objectives, hardware, algorithms and testing.

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 whereby they do not specify their objectives in computer-related terms, e.g. to make a certain process faster. 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..

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 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.

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. It is possible for some applications to generate the algorithms, these should be clearly annotated by the candidates to score any marks. Algorithms must clearly relate to the candidate's solution. If a candidate uses a spreadsheet to solve their problem then full details of the formulae and any macros should be included. Centres may wish to know that the use of modules when using a database package should include the use of linked tables. Similarly when using a spreadsheet modules can be achieved by exporting data from one worksheet to importing into another spreadsheet, i.e. the spreadsheets are linked together.

Many candidates did not produce test plans by which the success of their project could be evaluated. The results of a test strategy should include the predicted results, 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.

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 or submit details to an on-line database , in this case the work would qualify for the marks in the modules section.