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FOREWORD

This booklet contains reports written by Examiners on the work of candidates in certain papers. **Its contents are primarily for the information of the subject teachers concerned**.

COMPUTING

GCE Advanced Level and GCE Advanced Subsidiary Level

Paper 9691/01
Written – Paper 1

General comments

Most Scripts were well presented and showed a determination on the part of the candidates to do themselves justice in the examination room. The Paper was considered fair by the Examination Team and the questions elicited the full range of responses from the candidates. Some questions were obviously considered to be difficult by the candidates, but some are designed to be accessible to the more able candidates. There did not seem to be much evidence of candidates running into time trouble, with the exception of candidates who had evidently spent a disproportionate amount of time on the first few questions and who consequently found that they did not have the time left toward the end of the Paper that they expected to have. This is simple failure of exam technique. Once again, Examiners suggest to Centres that they impress upon their candidates the need to pace themselves in the examination. This Paper is 120 minutes long during which time the candidate can earn 90 marks, so candidates should be thinking in terms of just over 1 minute per mark. **Question 1** is worth 9 marks in total, so it should take just over 10 minutes to provide a flawless answer. It was clear that some candidates were spending far too long on the initial questions. The last thing that the Examiners wish to do is to curtail the enthusiasm of a candidate who feels the need to give more information than necessary, but they must realise that their answers are subject to time constraints.

The majority of candidates had been well prepared for the examination, having a good grasp of technical terms and were able to express themselves well and earn credit where it was deserved. The Examiners, once again, found a difference in quality of answer because of the context within which **Questions 8** to **12** were based. Candidates naturally find this type of question more taxing because of the added difficulty of having to think within a context. However, the effect was certainly not as marked as it has been in the past and this must be down to the teaching that the candidates have received in preparing them for the exam. A 'thank you' from Examiners to all the Teachers who have made an effort in this direction, perhaps a more important 'thank you' on behalf of your candidates because your efforts have worked.

There are still candidates who insist on using proprietary brand names. For example, when asked for a piece of software necessary to run a network, a popular answer was 'Windows NT'. This is a silly mark to lose. Examiners would like to reiterate that they have never accepted proprietary brand names for either software or hardware.

Most work was easily accessible to the Examiners. However, there are a few Centres where the Papers are tightly tied together with string, or in some cases stapled. Examiners find difficulty in marking Papers that cannot be laid flat because the right hand margin is used a lot. Please would Centres consider the way that Papers are tied together. If ordinary paper is used, a small space or margin down the right hand side of the paper helps the Examiner considerably.

Comments on specific questions

Question 1

(a) The definitions were reasonably well explained, though 'integrated software' was too often left simply as a collection of different pieces of software, missing out the all important fact that they can communicate with each other by sharing data.

(b) Well answered, though many found difficulty in expressing the reason why the two modes of processing were appropriate. If the example for batch processing is bank statements, it is not good enough to say that batch processing is appropriate because the data is very similar. That would also be true of the processing to be carried out on a computer game, but batch processing is not appropriate there. This type of answer is a criteria, not a reason for it being used. A better answer is that the result is not time sensitive so that computer resources can be used in a down time.

Question 2

Form based interface was too often confused with a menu based interface. They are very different and the difference needs to be understood. A menu gives a limited number of choices on the screen, from which the user needs to choose. A form based interface is used for the input of data, typically by a user taking orders over the phone. The user does not need to be an accomplished user of a computer because the input screen is designed like a mask which reduces their options.

The other two interfaces tended to be well described, the only problem being candidates finding a use for the command line interface. Attention is drawn to the published mark scheme for the acceptable responses to this and all the other questions.

Question 3

Too many candidates are wasting too much time on this sort of question. Many decide to write their own algorithm, though why they should do that when the algorithm is printed for them, Examiners do not understand. This is the most complex algorithm so far asked in this Paper and considering that this is a timed examination with many more questions on it, the algorithm question really cannot get much more complex than this.

The main error here was the resetting of the value of total to 10 every time the loop was executed. This resulted in 13,15… The other error was not stopping when k was equal to 2.

Question 4

Lovely answers, well described. The worry was that some candidates would be let down by their ability to explain something in English, but this was far from the case.

Question 5

(a) The definition of ASCII was disappointing. Many candidates simply attempted to write down what the acronym stood for. There are plenty of things that can be said and candidates should have spotted that there were two marks for this and so needed to say two things.

(b) These did not present a lot of difficulty for most candidates, though it was disappointing to see a number being content to describe a data type as numeric, more detail than this is always necessary. It was interesting to see so many describing the data type for a date of birth as an integer. The Examiners did wonder whether this was through an understanding or the mark was earned through luck but it is acceptable, though not what they were expecting.

(c) The question stated ‘Using this example…’ so general answers like ‘a file stores all the data’ were not accepted. The answer should have been ‘stores all the data about the students’.

Question 6

In a previous report Examiners wrote that this question was better answered. This time Examiners must report no improvement. It is known that the Teachers have been doing their best with this one, it is evident in the answers. However, many of the candidates are showing their confusion by writing down half truths and mixing up the order in which things happen. The perfect example is the interrupt which, despite the best efforts of us all, are still considered to emanate from the processor. There are many candidates that understand this work and produce model answers, but they are the more able candidates. Examiners are afraid that with many they have reached a limit and that no amount of extra work will improve the understanding of this topic. The message is to keep up the good work with the better candidates, who are scoring really well here, but do not dishearten those who cannot understand the concepts involved.

Question 7

Generally well answered, though too many are giving proprietary brands of OS and also using initials rather than spelling an answer out, for example NIC. Unless the initials actually appear in the Syllabus, they are very rarely accepted.

The layering of protocols is not well understood by any. There are still some able candidates who answer this question by listing the 7 stages in the OSI model. This is not worth much credit. Not only does it not answer the question but it is not on the Syllabus.

Question 8

Well answered except for the justification in part **(ii)** which many struggled with.

Question 9

(a) Poorly understood by most candidates. The most common response was to equate passive systems with batch processing and interactive systems with real time. This is a small section of the Syllabus which Examiners can recommend to Teachers for work for future sessions.

(b) Very poor responses. Many could not explain what an HCI was, but the big problem was in **(ii)**. Most wanted to describe the application and how dangerous it was. When this question is being answered there is no chemical plant because the HCI has not yet been designed. Answers expected were of the type: The expertise of the workers, the need to use colour wisely….

Question 10

Some candidates did not understand the question, but the majority scored very well here.

Question 11

The responses that were wanted here were quite straightforward. Few bothered to explain what the data looked like, or how it was collected, or how the system translated the raw data into something useful. Many managed to suggest sensibly what the data was used for but that was about it.

Question 12

Most candidates managed to talk about job loss and the need for training. These are the standard answers and few managed to get anything else. Perhaps this is an area for expansion for future sessions.

Paper 9691/02

Practical Tasks

General comments

Most candidates presented well-organised scripts that clearly showed their solutions to the tasks. However, there were a few candidates who treated the tasks as projects and provided documentation that showed feasibility studies and full analyses of the tasks. This was not asked for. The tasks should be simply solved using only the information in the Examination Paper.

A few candidates provided solutions on CD-ROMs or floppy disks. This is not acceptable. Moderators will not use these disks when checking the marking. Centres must understand that marks may only be awarded if the candidate has supplied written evidence that the awarding of the mark can be justified.

When marking the tasks, a tick should be placed next to each mark point for which the candidate has supplied evidence that the work has been done correctly. Then, the ticks for each part of a task should be counted. This is the mark to be awarded unless it exceeds the maximum, in which case the maximum allowed for that part of the task should be awarded. Teachers should not proportion the marks nor should any fractional marks be awarded.

It is also important that a Centre collects in all candidates work before they see the Mark Scheme. Candidates should never see the Mark Scheme.

When sending candidates' work to CIE, Centres should attach a copy of the individual mark sheet to each script, showing which marks have been awarded. The totals for each candidate should be transferred to the Summary Sheet and to the MS1. The totals are out of 60 and should not be converted into percentages. The Summary Mark Sheet and a copy of the MS1 should be included with the candidates' work. Without these documents Moderators cannot moderate the work and may have to completely mark the work again. Nor can they check for transcription errors easily. This can cause a delay in Centres receiving their results.

Comments on specific questions

Task 1

On the whole this task was well done.

(a) There were many very good solutions. The use of radio buttons and drop down lists was used successfully to allow users to choose their replies. However, there were a number of candidates who allowed users free choice. This makes analysing the results of the survey very difficult, if not impossible. Usually the layout of the data capture screen was good. Candidates should not create fancy and colourful backgrounds to these screens as they are both distracting and confusing when trying to enter data.

(b)(i) Again this was generally well done. The main errors were missing out the name and/or address of the social club and the date of the letter. A few candidates did not supply evidence that merge fields were used so that it looked as if they had simply typed six letters using a word processor.

(ii) This was not well done as most candidates provided a generic set of instructions. This was allowed this time but candidates should be made aware that the instructions should be for their own solutions. That is, candidates should have supplied a template for the letter and for the table of members. The instructions should then have explained how to edit the table and how to produce the standard letters using the template.

Task 2

(a) A large number of candidates drew a flowchart instead of a top-down design diagram. A flowchart is simply an algorithm whereas a top-down design diagram shows how the task is broken into modules.

(b) Some good solutions were provided, but far too many did not use meaningful variable names. This is very important in order to make the meaning of the algorithm clear. When writing programs, in future examinations, candidates will be expected to use meaningful names for variables and objects, such as buttons and text boxes, and to thoroughly annotate their code.

(c) The common error here was to use a variable to hold both a number and a string. For example, using statements like:

```
OUTPUT "Enter a number"
INPUT N
IF N = Yes THEN
   OUTPUT MEAN, MAX, MIN
ELSE
    TOTAL = TOTAL + N
Etc.
```

Clearly this is not acceptable.

Task 3

(a) Many candidates produced very poor invoices in that they had clearly never seen the types of layout expected. Common mistakes were to produce a single table of many columns and many rows. Each row represented the information required on a single invoice. Also, a large number of candidates did not provide hard copy evidence showing the formulae used.

(b) Although many good validation checks were created few showed how they were tested. Candidates should include evidence, such as screen shots, showing the data input and the results when the test data is valid and when it is not valid. The Moderator should be able to see both the input and the output at the same time.

Paper 9691/03
Written – Paper 3

General comments

Scripts were generally well presented with few instances of the Examiners having difficulty marking a piece of work because of poor effort on the part of the candidate. However, the standard of the responses to the questions is once again disappointing on this Paper.

This is the second year Paper, described in the Syllabus as the A2 Paper. Paper 1 is designed to be taken at the end of the first year of the two year course and is aimed at a very much lower level of knowledge than Paper 3. Examiners are aware that Centres around the world have different entry policies. Some prefer to continue the work to the end of the two years and then enter candidates for all the assessment in that session, while others cover the whole course in one year and consequently are forced to do all the assessment at once. Some candidates are finding difficulty in lifting themselves from the expectations of an AS Level Paper to the requirements of an A2 Paper.

One of the main problems is that there are sections of the Syllabus that are divided between the two levels. For example, it is important, as part of the systems life cycle, that candidates are able to consider implementing their designs into the organisation; the Syllabus states "explain the importance of … implementation planning". Few candidates have difficulty in picking marks up on this part of the Syllabus and **Question 10** on Paper 1 proved the point admirably. Compare this part of the Syllabus with section 3.8.e which states "…justify appropriate implementation approaches for a range of different applications…". This is not asking for a description but instead it needs the ability to consider what will happen in a particular situation. **Question 1 (b)** reads "Evaluate each of these methods for this application". A description of how the implementation is done is not what the question was asking for, yet this was the common answer. Most candidates had simply answered this question in exactly the same way as the question on Paper 1 because they were not ready for the difference in difficulty, or the changes in expectation of the Syllabus.

This is a problem which affects candidates who are taking the two Papers together because there is no expectation of a difference in emphasis of the questions. There are many other examples in the Paper which will be covered under individual questions.

There was little evidence of any candidates suffering time problems. The final few questions tended to score poorly, but this was thought to be due to their relative difficulty.

Comments on specific questions

Question 1

(a) Some valid points were made but too often the candidates spent too long on cost rather than on aspects of training. Others misread the question so that it became training about the supermarket's computer systems while others decided that the comparison was between training staff on computer based training programs and providing individual trainers for each member of staff.

(b) Very few marks were awarded here, not because the question was difficult (it was meant as part of an easy starter question), or because the candidates were unable to arrive at the correct responses, but simply because they did not answer the question. As has been stated above, this is the perfect example of the question which at face value is the same as the AS question, but it is examining a different skill (quite clearly stated in the Syllabus) and must be approached in a very different way by the candidates. As with all questions on this Paper, the attention of Teachers is directed to the published mark scheme for details of the acceptable responses to the question.

Question 2

This question was considered to be more complex than **Question 1**, but the candidates impressed Examiners by producing consistently good and at times excellent answers.

Question 3

(a) This was another example of not reading the question, although this time there cannot have been the confusion with the AS Syllabus because in the AS module it specifies that compilers and interpreters are not to be covered. Most candidates were happy to give general descriptions of the ways that compilers and interpreters worked rather than confine themselves to the limits of the question.

(b) This should be a simple knowledge based question but far too many candidates were unable to distinguish between lexical and syntactic analysis. A common error was to suggest that keywords were compared to a table of acceptable keywords. This is a part of lexical analysis because it must take place before the commands are tokenized.

Question 4

Generally the answers were, once again, the type that the Examiners would expect to see at the end of an AS module. The level of understanding simply was not in evidence. The requirement is certainly there: "explain how a stack is used to handle procedure calling and parameter passing" (section 3.5.e).

(a) Some good answers were seen here, though too many believed that the stack contained the procedures so that when they were finished they were put back on the stack. The worrying thing is that to believe such a strange idea the candidates must be picking it up somewhere. If it is from a text book or a web site please let us know so that we can warn others more directly.

(b) There was some basic understanding that a stack is needed and that it is a LIFO structure, but otherwise there was little evidence of understanding here and the idea of parameter passing has passed almost all candidates by.

Question 5

This was a standard bookwork question which many candidates answered very well. However, too many still do not understand this simplest of pieces of theory, commenting about the program counter counting the number of programs or storing the program instructions, the MDR doing the decoding and the accumulator being incremented. This is not serious because there will always be a small proportion of candidates who struggle with even questions like this. The point is that there was a proportion of candidates who did not read the question. They simply saw the list of registers and wrote a description of each one. Examiners suspect that some of these candidates did not understand the requirements of the question because of the language barrier, but hope that that proportion is small. However, Examiners are convinced that many 'misread' the question because of a basic laziness leading to a misinterpretation. The list of registers was placed in the question in order to help candidates and Examiners are convinced that in most cases it did. If any Teachers reading this would like to comment on this or any other aspect of the exam or this report, please do not hesitate to send a message to the discussion group, after all it is only through a better understanding on the part of Teachers and Examiners can we hope to be fairer to the candidates.

Question 6

This question was intended as a higher level question and so it proved. There were some excellent responses here which was very good to see. The surprising thing was the number of mediocre scripts where the candidate had been able to score quite well. In fact the majority of the candidates showed that they at least understood what floating point numbers were. This was a very difficult concept, producing encouraging responses from many candidates.

Question 7

(a) Too many candidates were unable to score well here because they did not understand the concept of an intranet. Too many believed that it was a LAN and spent time discussing sharing of resources and viruses et al.

(b) Some good answers were seen here. Most candidates referred to cost and danger but too many then came up with unexplained or too generalized examples. For instance, "Simulations are used when it would be too dangerous to use the real thing e.g. a nuclear power station". One mark for the idea of danger, but what is it that the candidate is then trying to say? A nuclear power station is not inherently dangerous and even if it was is the intention to simulate one? To what end?

Question 8

Answers were obviously grouped into those candidates who had done some work on OOP, who tended to get full marks and those that had not who tended to score zero. Too many answers gave as an example of inheritance 'outputdata()' because it appeared in all three.

Question 9

(a) Spooling is not understood properly. The majority of candidates believe that the jobs are placed in a queue which is then emptied in order of job arrival. Please check the mark scheme for the acceptable response.

(b) The question clearly referred to job type, however few of the answers did. Many talked about priorities and others went in to great detail about the three states in which a job can find itself. Others talked about different types of operating systems as ways of handling multiple jobs, but few talked about job types.

Question 10

This was a well answered question. However there are still candidates who persist in trying to read a value from the middle of a queue. Also there was a significant number of candidates who tried to describe the queue being held in an array despite the fact that the question stated that it was being held in an array.

Question 11

(a) This question was a bit more complex than it had been in the past but most candidates were able to score some marks here. However, few considered the many relationships between DESIGN and PLANTS and then inserted a link table between them. There was very little evidence of relationship describers being used. This was very strange as one would have thought it almost impossible to come up with a project based on databases without understanding the relationships created in an ER diagram.

(b) It is difficult to believe that a candidate can go through two years of an A Level course without having to extract information from a database. This was all that was being asked here.

Paper 9691/04

Coursework

General comments

This report provides general feedback on the overall quality of project work for GCE Advanced Level Computing candidates. In addition, all Centres receive specific feedback from their in the form of a short report that is returned after moderation. This reporting provides an ongoing dialogue with Centres giving valuable pointers to the perceived strengths and weaknesses of the projects moderated.

The projects submitted covered a wide variety of topics with many candidates showing evidence of researching a problem beyond their school or college life. Most projects were developed using database management software such as Access or Foxpro. Centres are reminded that the computing project may involve programming or the tailoring of generic software packages and may also involve the choosing and installing of hardware. However, the production of a Web site that just disseminates information does not provide sufficient scope for an 'A' Level standard project. The Syllabus does state that it is not intended that any method of solution is better than another, merely that the solution must be one that suits the problem that is being solved. Guidance on the selection of projects is included in the Syllabus.

The selection of an appropriate problem by the candidate is extremely important, as the analysis, design, implementation and evaluation of a computerised system should always involve consultation with a 'third party' user throughout the development of the system.

Centres are reminded that the requirements are clearly set out in the Syllabus, which can also act as a useful check list setting out the expected contents of each section.

Project reports and presentation

The presentation of most of the reports was to a very high standard, with reports word-processed and properly bound. However, the use of proofreading and a spell checker is to be recommended. In addition, candidates should ensure that only material essential to the report is included so that there is only one volume of work submitted per candidate. Candidates are reminded that the submission of magnetic or optical media is not required and the Moderators do not consider it.

It is recommended that the structure of the report follows that of the mark scheme, this gives a clear outline as to contents for the candidates to consider and also aids the assessment by Teachers and moderation of the work.

Project assessment and marking

In some cases, the standard of Teacher assessment was close to the agreed CIE standard. However, some assessment was generous particularly where evidence of user involvement was required and was not evident in the candidate's report. Centres should use the mark scheme set out in the Syllabus and include a detailed breakdown of the marks awarded section by section, together with a Teacher commentary as to why the marks awarded matched the criteria. Comments from the Teacher greatly aid the moderation of the projects, allowing Moderators to clearly identify why the Teacher had awarded marks for each sub-section. Centres are also reminded that the use of half marks is not allowed.

Comments on specific questions

Question 1

The comments set out below identify areas where candidates' work is to be praised or areas of concern and are not a guide to the required contents of each section.

(a) Definition investigation and analysis

(i) Definition - nature of the problem

Most candidates could describe the organisation and methods used but not all candidates identified the origins and form of the data.

(ii) Investigation and analysis

Candidates should clearly document user involvement and agreed outcomes. Better candidates clearly showed evidence of observation, interviews and investigation of documents currently in use. A detailed requirements specification based on the results of the candidate's investigation should be produced.

Also, alternative approaches need to be discussed in depth and applied to the candidate's proposed system in order to obtain high marks.

(b) Design

(i) Nature of the solution

The requirements specification set out in the analysis needs to be discussed with the user and a set of achievable, measurable objectives agreed. These objectives will then form the basis for the project evaluation.

Only examples of screen layout design and output formats should be included. Many candidates only considered the screen layouts and neglected the reporting aspect of their system. Candidates need to fully document their proposed data structures and provide a detailed description of the processes to be implemented.

(ii) Intended benefits

Candidates need to clearly identify the merits of the intended system.

(iii) Limits of the scope of solution

Candidates need to discuss the limitations of the intended system and estimate the size of the files required. Centres are reminded that there are marks specifically available for **(ii)** Intended benefits and **(iii)** Limits of the scope of solution.

(c) Software development, testing and implementation

(i) Development and testing

Evidence of testing needs to be supported by a well designed test plan that includes the identification of appropriate test data, including valid, invalid and extreme cases, and expected results.

(ii) Implementation

An implementation plan needs to be included, this should contain details of user testing, user training and system changeover that have been discussed and agreed with the user. In order to be awarded high marks for this sub-section there needs to be written evidence from the end user that they have used the system and agree with the strategy for implementation.

(iii) Appropriateness of structure and exploitation of available facilities

Candidates should discuss the suitability of both hardware and software. Few candidates provided a log of any problems encountered together with details of how these problems were overcome. These details are required if high marks are to be obtained in this sub-section.

(d) Documentation

(i) Technical documentation

It was good to see more candidates producing a stand-alone technical guide including the following: record, file and data structures used; database modelling and organisation including relationships, screens, reports and menus; data dictionary; data flow (or navigation paths); annotated program listings; detailed flowcharts; details of the algorithms and formulae used. However, candidates need to annotate all parts of this guide since this is important for subsequent development of the system. Few candidates included the specifications of the hardware and software on which the system can be implemented.

(ii) User documentation

For full marks the candidate needs to include an index and a glossary, the guide needs to be complete including details of backup routines and common errors. Also, good on-screen help should exist where this is a sensible option.

(e) Evaluation

(i) Discussion of the degree of success in meeting the original objectives

Very few candidates considered each objective in turn and indicated how the project met the objective or explained why the objective was not met. Even fewer candidates included use of user defined, typical test data as part of this discussion.

(ii) Evaluate the users' response to the system

Many candidates did not provide clearly recorded evidence from their end user and this is essential. Candidates need to obtain the users response to how the system developed meets the agreed specification and evaluate this response as to the satisfaction with the system developed.

(iii) Desirable extensions

Most candidates identified the good and bad points; some candidates identified limitations and possible extensions but to obtain top marks the candidate needs to indicate how the extensions would be carried out.