COMPUTING

| Paper 9691/11 |
| Written Paper |

General comments

The work was well presented in most respects. There was no evidence that any of the candidates had experienced time problems, the final responses were neither missing nor gave an appearance of being rushed.

Sensible use had been made by many of the candidates of various examination techniques. The use of bulleted responses to the longer answer questions allows the candidate to concentrate on the computing content. This also acts as a method for determining whether or not enough detail has been supplied to earn the marks available for the question. Diagrams are often helpful and, again, help the candidate to order their thoughts.

Comments on specific questions

Question 1

Most candidates were able to name at least 1 or 2 functions of an operating system with the majority being able to name four. The more able candidates were then able to go on to describe the functions that they had identified but this was rarer. A few candidates confused the question with a question asking for the fetch execute cycle. Candidates should be aware of basic exam technique which shows them that the question asks for four functions and yet is worth eight marks and consequently it will be necessary to go further than a simple statement to gain all the available marks.

Question 2

(a)   An encouraging majority were able to describe the two types of code. Candidates need to be aware that definitions need to be precisely stated. A typical imprecise answer such as 'Source code is the high level language…' would not be given marks.

(b)   The common response to these questions was to provide examples of the different error types. Stating that a syntax error is a spelling mistake in the code is a perfectly acceptable example of a syntax error but it does not explain what a syntax error is. Similarly, an arithmetic error is an example of a logic error but there are many others. A logic error is a failure in the design of the program code or a conflict between the algorithm and the code.

(c)   Candidates were commonly able to state what the type of testing was but could not go further to earn the descriptive mark in each case.

Question 3

(a)   The data held relating to a telephone number is not numeric. It is not possible to carry out sensible arithmetic with a telephone number and the data itself may contain non-numeric characters; the most common in various parts of the world being spaces, brackets and leading zeros, particular in mobile phone numbers.

The number of subjects needs to be integer type. 'Numeric' is not a data type.

(b)   Candidates need to be aware that it is necessary to answer this question in the context of the School scenario and if a simple hierarchy was offered it could only attract a single mark.

Question 4

The answer for the knowledge base could simply have been: 'A store of all the facts known about medical diagnosis (1 mark) collected from experts in medicine (1 mark)'.

Question 5

This was a good example of a question which was best answered using bulleted or numbered points. This would help candidates to think about the stages and the order in which things should be done. Many candidates gave good answers to this question but typically scored four or five marks. Most candidates were able to score one or two marks for the basic process. Few were able to give a convincing description of the automatic ordering process and fewer still used a safeguard against multiple orders being sent, the result being that once the reorder limit has been reached, an order for more stock would then be sent every time an article was sold.

Question 6

(a) Plenty of correct responses. The question specifically stated that the network was a LAN which removed the possibility of using a modem.

(b) The shape was almost always correct. Other marks were given for the use of central machine, usually labelled as a hub or server and the inclusion of a peripheral that could be shared on the network, these were less often shown.

(c) Some excellent descriptions from some of the more able candidates were seen.Candidates need to be clear about the differences between parity, echoing back; handshaking, and a check sum. This is a difficult concept to describe but needs to be accurate to earn the marks.

Question 7

Well answered by most candidates. Answers were almost all presented as either pseudocode or a flowchart, while a few wrote code in a high-level language which would also answer the question. The program code is perfectly acceptable and in this case provided some excellent answers. Errors made by candidates in the coding while the logic of the response was clear did not lose any marks as it is the logic that is being tested. The pseudocode responses were well explained and the candidates were generally able to score well as they were able to show most of the points required. The flowcharts were not so well produced. The candidates are quite at liberty to use the form of response which they feel most comfortable with though flowcharts seem to present candidates with problems that other forms of response do not. A good example is the use of a looping structure.

Question 8

(i) Most candidates were able to give the disadvantage of workers not acting as they normally would do but the advantage was rarely precise enough.

(ii) An advantage would be that detail can be explored. Whereas a disadvantage would be that this is very time consuming.
.

(iii) Many candidates thought that the question was about the use of questionnaires, there were few who seemed to understand that documents could tell the analyst the types of data required for input and output to and from the system.

Question 9

(a) An acceptable technique of measuring would have been by callipers or by shining laser light at metal and measuring shadows produced.

(b) The validation method required here was a range check, but was commonly given as a length check. Candidates need to be aware that verification is not the same as validation. A correct answer here would have been: value input twice,-computer compares two values, if different, then error; or a visual check where the operator looks at the value typed in as it appears on screen and checks it is correct.

Question 10

There was some confusion between **Questions 10** and **11a**. Candidates need to be aware of the difference between an output format and an output device.

Question 11

(a)   Most candidates were able to score full marks here.

(b)   There is considerable confusion with the concept of a form-based HCI. Many candidates confused it with a menu-based HCI or a GUI.

Question 12

Most candidates were able to provide responses concentrating on the possibility of the need for training and the possibility of redundancy. . The best responses included descriptions of positive benefits accruing from the introduction of the new technology; such as the fact that the extra training would give the workers extra skills which will make them more employable and also means that they are able to command better pay.

COMPUTING

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(b)   The shape was almost always correct. Other marks were given for the use of central machine, usually labelled as a hub or server and the inclusion of a peripheral that could be shared on the network, these were less often shown.

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COMPUTING

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Paper 9691/13

Written Paper

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Comments on specific questions

Question 1

(a) This was well answered by many candidates. The weaker answers consisted of simply rewording the question: 'It is used to format the disk' or wrongly stating that formatting allowed for selective removal of some files while leaving others untouched.

(b) Most candidates were able to state that the utility reduced the size of the file and then give a reason why it might be done. Weaker responses were in the form: ' It compresses the size of the files'. It is important to note that simply juggling the order of the words in the question does not gain credit.

(c) Most candidates were able to state what a hardware driver did. The second mark was for expanding on the basic point by saying when it would be needed.

(d) This was well answered with most candidates were able to state two elements of file handling.

Question 2

(a) Some candidates were able to describe source code and object code perfectly. Weaker answers were characterised by confusion of these terms.

(b) The common response to these questions was to provide examples of the different error types. Stating that a syntax error is a spelling mistake in the code is a perfectly acceptable example of a syntax error but it does not explain what a syntax error is. Similarly, an arithmetic error is an example of a logic error but there are many others. A logic error is a failure in the design of the program code or a conflict between the algorithm and the code.

(c)   Candidates were able to say what the two types of testing were not, 'testing when the code cannot be seen'. The response should be more positive: 'Specific inputs to system are chosen to represent normal, abnormal and extreme data whose expected outcomes are known, which makes possible a comparison between what was expected and what is the actual result'.

Question 3

(a)   A barcode number should be stored as string data type because it can start with a zero and also can contain a non-numeric character as the check digit.

(b)   Candidates need to understand that it is necessary to answer this question in the context of the shop scenario and if a simple hierarchy was offered it could only attract a single mark. Weaker responses showed much confusion as to the hierarchy of the three terms. A file consists of many records and each record consists of a number of fields.

Question 4

(a)   Most candidates were able to talk about inputting data to the system. Candidates need to remember that a HCI is also the output device from the system, the means by which the results can be reported to the user.

(b)   An inference engine is a piece of software which applies the rules in the rule base to the knowledge in the knowledge base and obtains results. It also supplies these results in a way that the user can easily use.

Question 5

This was a good example of a question which was best answered using bulleted or numbered points. This would help candidates to think about the stages and the order in which things should be done. The process is a series of events which should be thought of, and described, as such. Typical is the search procedure which needs to be described as: the first search criterion is Subject = Geography. Once this has been done the second criterion, to be applied to the results of the first is Teacher = Ms Ahmed. This is now worth two marks whereas 'Find all the students who do geography with Ms Ahmed' is simply rewriting the question. The sending of emails is a perfectly acceptable way to interpret the question and the mark points remain the same because the process is almost identical.

Question 6

(a)   Plenty of correct responses. The question specifically stated that the network was a LAN which removed the possibility of using a modem.

(b)   The shape was almost always correct. Other marks were given for the use of terminators and the inclusion of a peripheral that could be shared on the network, these were less often shown.

Question 7

Well answered by most candidates. Answers were almost all presented as either pseudocode or a flowchart, while a few wrote code in a high-level language which also answered the question. The program code is perfectly acceptable and in this case provided some excellent answers. Errors made by candidates in the coding while the logic of the response was clear did not lose any marks as it is the logic that is being tested. The pseudocode responses were well explained and the candidates were generally able to score well as they were able to show most of the points required. The flowcharts were not so well produced. The candidates are quite at liberty to use the form of response which they feel most comfortable with though flowcharts seem to present candidates with problems that other forms of response do not. A good example is the use of a looping structure.

Question 8

(i)   The requirements specification is the document produced by and agreed to by the person producing the new system and the person for whom the system is being produced. Many responses talked at great detail about the hardware which would be necessary for the system.

(ii) The first mark was obtained by most candidates. The question did say that the answer should include 'an example of the content', this was less often provided. An important part of examination technique is to read past the first 'keyword' in the question to ensure that the information required is presented in the answer.

(iii) The same comments apply here as were stated in **(ii)**. It is important to say 'screenshots showing the table of food additives to be given to the various cows explaining what each of the values is', or something similarly appropriate to the user guide.

Question 9

(a) The common response was a barcode pinned to the ear which could be read by a barcode reader. A few candidates did discuss the use of a transponder beneath the skin or attached to the collar which could be read by passing through an electrical field when the cow entered the milker. Other methods, like the barcode reader, were credited if they were feasible.

(b) There were a number of candidates who gave three methods of verifying the values rather than validating them.

Question 10

This was well answered. The weaker responses did not relate the output formats to the scenario of the milking parlour.

Question 11

(a) The standard peripherals were credited as long as the candidate could justify them, but this was a somewhat out of the ordinary type of scenario which opened up a number of less obvious peripherals the most obvious being a touch screen because of the problems associated with dirt in the cowshed and the fact that it can be used for both input and output.

(b) Candidates need to understand the concept of a menu-based HCI. Many candidates confused it with a form based HCI while others wrongly insisted that it was a GUI.

Question 12

Most candidates were able to provide responses concentrating on the possibility of redundancy. The best responses included descriptions of positive benefits accruing from the introduction of the new technology; such as the fact that the extra training would give the workers extra skills which will make them more employable which also means that they are able to command better pay.

COMPUTING

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Paper 9691/02

Practical Programming Project

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This was the last time that this paper was taken in the form of a project.

The presentation of all projects was as good, if not better, than ever.

This time even more projects were of a very high quality. It was a pleasure to read so many where there was a worthwhile problem to solve, and the quality of the code and its associated documentation was very clear.

Many Centres now submit code that is clearly annotated, and the reader, or potential developer, is able to follow the structure and detailed logic of the code easily.

The standard and depth of the design stage has steadily improved over the years. Many candidates now reference their previous work in the implementation and technical documentation stage which helps cut the size of the project.

The weakest point that has not improved so much in the life of this paper is the testing. Too often it is a check of input validation and each button working. It does not always show that the program actually does the job it set out to do.

The majority of Centres have convinced themselves and their candidates that a high quality grade can be achieved with a project of some 30 to 40 pages.

There were some of 300 pages. This does not necessarily guarantee quality, but does imply a huge amount of candidates' time.

This will change from next year as the paper moves from being coursework to an examination.

Candidates will need to have programmed and documented a problem similar to the projects to know all that is expected in these examinations.

COMPUTING

General comments

The work was well presented and generally the way that arguments were made was very clear and precise.

The diagram for **Question 2** was generally clearly presented and most candidates had sensibly not wasted time by making their work look good, but instead had concentrated on the Computing facts that needed to be shown in the response.

Many candidates used bulleted answers, a very sensible way of allowing the candidate to concentrate on their knowledge of Computing. Bullets are extremely valuable because they allow the candidate to concentrate their efforts on the question and to write down facts relating to the question. They also allow the candidate to keep a check on how many points have been made because candidates must be aware that the full mark allocation for a question can only be awarded if enough points have been made for that response. However, the use of bulleted points can be counter-productive when they encourage the candidate to present minimal content and ignore the context provided in the question.

Comments on specific questions

Question 1

(a)   The question related to the LANs in the firm. Most candidates answered the question in general terms rather than relating the response to the application given.

(b)   The basic definitions given by candidates were normally acceptable but the second mark in each case was rarer. A typical example would be that a candidate would state that a bridge was used to allow communication between two dissimilar LANs. To gain the second mark it required a statement that it would be used to connect the accounts and sales departments' networks. The question asked explicitly for the use in this example, and candidates need to understand that this means marks will be available for relating the answer to the example in the question.

(c)   Those candidates who used bullets to present their responses generally gave the full set of four points.

Question 2

Candidates need to understand the concept of ER diagrams and how to produce them. A small number of candidates realised that the relationship between MEMBER and SESSION was many-to-many and hence needed a link entity. Some candidates wrongly decided to put link entities in between all the other pairs, including ACTIVITY and MEMBER, between which there is no relationship.

Question 3

Candidates need to understand each stage of the fetch-execute cycle. They need to know the purpose of each register and what each contains at every stage. The program counter does not store the instruction and the Accumulator does not store all the data for a program.

Question 4

(a)   A well understood topic by most candidates, who managed good answers here. The better answers were structured in some way and of those the best were those candidates who had

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International Examinations

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produced a table of comparisons, candidates who had done this invariably scored full marks. Candidates need to understand the concept of 'object code'.

(b)   Candidates need to be able to distinguish between lexical analysis and syntax analysis. Answers relating to producing tokens and error messages were fairly universal among those who gave credit worthy answers.

Question 5

(a)   Most candidates were able to give two types of interrupt and examples of each.

(b)   Candidates need to understand that an interrupt is a signal generated by an event which requires the attention of the processor. When the operating system is ready to service the interrupt, it saves the state (that is the contents of all registers) of the interrupted process (the job) onto the stack and passes control to the appropriate interrupt service routine. Once the interrupt is serviced control is passed back to the interrupted process (the job) after the state of the registers have been restored.

Question 6

Candidates produced good answers in the main. Many candidates gave good algorithms but failed to insert the new value. Weaker answers gave an algorithm for post-order traversal.

Question 7

(a)   There were some well analysed and presented answers here with the candidate presenting the whole process with considerable accuracy. There was a significant number though who treated this as a fixed-point number and then decided that the first byte represented 9 and the second represented ½. Those candidates who produced good answers to **(i)** were also able to provide good answers for **(ii)**.

(b)   This is a good example of a need for candidates to understand basic exam technique. There are four marks here and consequently there are two marks for each part. Most candidates scored two marks. A few candidates confused the two concepts.

Question 8

(a)   Well answered by most candidates.

(b)   Many responses centred around the concept of advertising rather than the commerce part of the scenario, but most candidates scored well giving most of the points that were expected.

(c)   The user documentation was well answered. Candidates need to be aware that in this scenario the technical documentation is intended for the person who is to be responsible for the maintenance of the system, not the programmer.

(d)   Many candidates were able to distinguish between the three types of maintenance but very few were able to relate them to the application around which the question was constructed.

Question 9

Many candidates were able to say that in an object-oriented language the data and methods were stored together. Fewer candidates could add detail for a second mark such as that data can only be accessed using methods of the object. Few candidates could describe declarative programming languages. Candidates need to understand that the computer is given facts and rules and that the outcomes are described, not how to achieve them. Low level languages use mnemonics and labels and instructions are one-to-one with machine code.

Question 10

(a)   Candidates need to understand that parallel processing means the simultaneous use of several processors to carry out a large number of similar calculations which are carried out in much shorter time and calculations are interdependent with results of one group feeding into next calculations.

(b) Few candidates could state that one disadvantage of parallel processing was the need for more complex software.

COMPUTING

Paper 9691/32

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Comments on specific questions

Question 1

(a)   Most candidates scored one mark for stating that the intranet was within an organisation. Weaker answers stated that the Internet was communication on a WAN while an intranet was on a LAN. The majority of candidates did not mention a second point for the second mark.

(b)   This was very well answered by many candidates. Candidates need to understand the concept of enhancing text or how it is done using html.

(c)   Most candidates scored reasonably well. Weaker answers were characterised by the idea that hackers are bad people who should be stopped and this can be done by using passwords, and encryption. A mention of viruses and virus checking would have been credited if the candidates concerned had made it clear they were worried about things like spyware.

Question 2

Candidates need to understand the concept of ER diagrams and how to produce them. A small number of candidates realised that the relationship between FIRM and BUILDING was many-to-many and hence needed a link entity. Some candidates wrongly decided to put link entities in between all the other pairs, including CONTRACT and BUILDING, between which there is no relationship.

Question 3

Candidates need to understand each stage of the fetch-execute cycle. They need to know the purpose of each register and what each contains at every stage. The program counter does not store the instruction and the MAR does not store all the addresses.

Question 4

(a)   Creditworthy responses included the idea that more immediate/more useful error diagnostics could be given. Few candidates could go further than this.

(b)   Candidates need to be able to distinguish between lexical analysis and syntax analysis. Answers that included statements such as 'Checks the reserved words' and 'creates the symbol table' were given credit.

(c)   The best answers were based around the production of intermediate code and optimising the code. Weaker answers merely stated that the high-level language was translated into object code.

Question 5

Most candidates scored well in this question. Weaker answers confused segmentation and paging.

Question 6

Many responses correctly stated the order of the nodes to be for (i) Ash, Jam, Lie, Poa, Ros, Siv and for (ii) Poa, Jam, Ash, Lie, Siv, Ros. Some candidates wrongly ended the first traversal with Siv, Ros rather than Ros, Siv and the second traversal often began with Jam rather than Poa.

Question 7

This year a distinct improvement in working with floating point numbers was noted. In part **(a)** candidates need to show the full explanation for full marks. In **(b)** the addition of the two mantissas was generally done well. The question stated that the mantissa consists of 6 bits. Therefore the result should also be given using 6 bits.

Question 8

(a)   This question asked for three facilities and 6 marks were available for the answer. Candidates should be aware that this means they need to expand their answers to make each point worth 2 marks. Few candidates seemed to realise that the question said that the email had already been read.

(b)   Candidates need to be aware that simply reordering the words in the question is not worth credit. Instead of saying 'text-only files contain only text' they need to give more information, for example that text-only files contain only characters represented in ASCII.

(c) (i)   Most candidates could describe the contents of user documentation drawing on their own experience of having recently completed a user guide for their project work. Candidates need to answer the question set, which stated that the document was to be for the point-of-sale operators. Simple maintenance such as changing a till roll might therefore be part of such a user guide.

(ii)   Candidates need to understand the difference between phased and pilot methods of implementation. Few candidates could answer with a description that was good enough to distinguish between them.

Question 9

Few candidates could describe procedural and declarative programming languages. Many candidates were able to say that in an object-oriented language the data and methods were stored together. Fewer candidates could add detail for a second mark such as that data can only be accessed using methods of the object.

Question 10

(a)   Candidates need to understand that parallel processing means the simultaneous use of several processors.

(b)   Most candidates could describe the idea of time sensitivity. Weaker answers were characterised by the confusion of the need for a large number of calculations with the perception that the calculations need to be very complex.

COMPUTING

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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 Moderator 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 better candidates again showing evidence of researching a problem beyond their School or College life.

In order to have the full range of marks available to the candidate, the computing project must involve a third party client whose requirements are considered and clearly documented at all stages of the system development. Centres are reminded that the project work is designed to test the candidates' understanding of the system life cycle, not just the use of software to solve a problem. The requirements are clearly set out in syllabus *section 7.2* 'The Guidance on Marking the Computing Project' section. These requirements can act as a useful checklist, for both teachers and candidates, setting out the expected contents of each section.

Centres are reminded that this guidance and the marking scheme are changing in 2011. **Please use the A Level Computing Syllabus for 2011 for guidance on project work to be submitted this year.**

Centres are also reminded that candidates should use this guidance for the expected contents of their reports rather than some of the popular A Level textbooks available for project work, which do not cover the full requirements of the CIE syllabus. Candidates who prepare their work only using text books and not the syllabus for guidance may miss out vital sections of their reports; or complete unnecessary work such as feasibility studies and costings.

Project Reports and Presentation

As usual, the presentation of most of the reports was to a very high standard, with reports word processed and properly bound. However, 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 authentic letters from end users are essential to provide evidence for the Evaluation and Investigation and Analysis sections, these letters must not be typed out by the candidate.

It is strongly recommended that the structure of the candidate's report follows that of the mark scheme set out in the syllabus. Essential evidence should not be relegated to appendices. This allows both teachers at the Centres and Moderators to check easily that work for all sections has been included. Also it is essential that the **pages of the report are clearly numbered** by the candidate. Candidates should also include their **centre number and candidate number and the date in the header/footer of each page**.

From 2011 there are marks available for the quality of reporting, see page 36 of the 2011 syllabus.

Project assessment and marking

Unfortunately few Centres provided a breakdown of marks showing the marks given for each sub-section of the syllabus. Centres that provide a commentary are far more likely to have accurately assessed the project work of their candidates.

Centres are reminded that in future they must use the marking grid set out in the syllabus on pages 48 to 51 and attach a completed copy to the front of every candidate's report. The completed grid should include

references to the appropriate pages in the candidates' reports where evidence for each section can be found.

Section 3 Comments on Individual Sections

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 described the organisation and the methods used but only the better candidates identified the origins and form of the data.

This sub-section of the report remains the same from 2011.

(ii)   Investigation and Analysis

In order to gain good marks candidates must clearly document client and user involvement and clearly state agreed outcomes. Candidates need to consider carefully the evidence obtained from interviews, observation of the existing system and user documents, and then ask follow up questions to fill in any gaps in the knowledge obtained about the current system or requirements for the new system. Also alternative approaches need to be discussed in depth and applied to the candidate's proposed system. A detailed requirements specification should be produced based on the information collected, this must include the specific requirements of the system to be produced and not just concentrated on hardware and software.

This sub-section of the report remains the same from 2011. However Centres are reminded that a distinction has been made between the 'client', who requires the new system and the day-to-day 'users' of the system. In many cases the client may also be a user of the system.

(b)   Design

(i)   Nature of the solution

Centres are again reminded that the requirements specification set out in the analysis needs to be discussed with the client and a set of measurable objectives agreed. These objectives will then form the basis for the project evaluation. Many candidates proposed data structures and designs for input screens but then forgot to provide a detailed description of the processes to be implemented and designs for the required outputs.

This sub-section of the report remains the same from 2011.

(ii)   Intended benefits

Candidates should describe the benefits of their intended system, not just a list of general statements that could apply to any system.

This sub-section of the report remains the same from 2011.

(iii)   Limits of the scope of solution

Candidates should describe the limitations of their intended system, not just a list of general statements that could apply to any system.

Full marks for this section cannot be awarded without candidates supplying evidence for **(ii)** and **(iii)**.

This sub-section of the report remains the same from 2011.

(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, together with expected results for all tests. The test plan should show that all parts of the system have been tested. Yet again, many candidates only tested the validation and navigation aspects of their system, and omitted to test that the system did what it is supposed to do, thus not being able to gain marks in the highest band for this section.

     (ii)   **Implementation**

        It was pleasing to see more candidates providing a detailed implementation plan that contained details of user testing, user training and system changeover. However, for good marks to be awarded there should be evidence to show that the system has been seen and used and these plans have been agreed with the client.

     (iii)   **Appropriateness of structure and exploitation of available facilities**

        For good marks here candidates need to discuss the suitability of both hardware and software, not just provide a list. Also as well as the log of any problems encountered together there should be details of how these problems were overcome.

        This section will have many changes to both the structure of the report, content required and the awarding of marks from 2011. There are four sub-sections: development, programming, testing and installation. Please see pages 39-41 of the 2011 syllabus for details. Candidates will need to show their competence in programming.

(d)   **Documentation**

     (i)   **Technical Documentation**

        The standard of work provided for this section is usually high.

        This sub-section of the report will be replaced by systems maintenance documentation. Please see page 42 of the 2011 syllabus for details.

     (ii)   **User Documentation**

        This section was completed to a good standard by most candidates. Centres are again reminded that for full marks the candidate must include an index and a glossary, and the guide needs to be complete including details of how to install the new system, backup routines and a guide to common errors. Also good on-screen help should exist where this is a sensible option.

        This sub-section of the report remains the same from 2011. However it is recognised that much user documentation is now provided as electronic guides using hypertext, if the candidate has chosen this method then annotated screen dumps of the hypertext document may be submitted by the candidate for this sub-section.

(e)   **Evaluation**

        Centres are again reminded in order to gain high marks candidates need to provide a detailed evaluation that included the content set out in the guidance for marking projects section of the syllabus. Many candidates provided scant evidence for this section, if this is the case then there are few marks that can be awarded.

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

        Candidates need to consider each objective set and explain how their project work met the objective or explain why the objective was not met. Candidates should also indicate where the evidence, probably from testing or feedback from the users of the system, could be found in their report to support these conclusions.

This sub-section of the report remains the same from 2011.

(ii)   Evaluate the users' response to the system

Again Centres are reminded that this response needs to be clearly provided from the end-user showing that they have used the system, not just reported by the candidate. The candidate should then evaluate their client's and users' responses.

For evidence in this section to be creditworthy, the candidate must include original letters, preferably on headed notepaper, signed by the client and not typed and/or composed by the candidate.

This sub-section of the report remains the same from 2011.

(iii)   Desirable extensions

Most candidates identified possible extensions but did not always identify the good and bad points of their final system.

This sub-section of the report has been removed from 2011.