CONTENTS

COMPUTING ADVANCED LEVEL

> **Paper 5216**
>
> **Computer Systems, Communications and Software**

General comments

The paper appeared to perform well and provide good discrimination between candidates of different abilities. It was very pleasing to see the significant number of really excellent scripts and the candidates and the Teachers who prepared them can feel justifiably proud of the achievements. However, there are still a significant number of candidates scoring very low marks. As in previous years, some candidates would benefit from a more targeted and thorough preparation before sitting this exam. Happily the vast majority of candidates were able to equip themselves well, despite the obvious disadvantage of sitting an exam paper written, and to be answered, in a second language for most candidates. Examiners are always amazed by this and the candidates really should be congratulated on their ability to make themselves understood so well. The presentation of work is also continuing to improve and there are very few cases of candidates who are unable to convey their thoughts to the Examiner.

There was no evidence of any time trouble suffered by candidates, though many presented very full scripts. Despite the questions being of very different degrees of difficulty, all produced a full range of marks from zero to maximum on at least some papers.

There was an issue raised about the validity of the question about knowledge based systems being used for diagnosis, but the Examiners did think that the question was fair as the wording was a copy of the bullet point in section 1.11 of the syllabus. A large sample of the scripts was double marked in order to establish a difficulty with candidate understanding, but there were no recognisable differences between candidates of similar overall attainment.

Comments on specific questions

Question 1

Intended as an easy starter question and so it proved with many candidates scoring full marks. The only problem was caused by candidates who suggested 'bar code reader' as an input device and then described it as something that 'reads bar codes'. It is not possible to score two marks for saying the same thing, in the same words, twice. There is an argument anyway that 'reading' implies a degree of understanding, so the Examiners were looking for something that would describe the process without repeating the word 'reading'. A sensible response would have been that it scans the barcode. Candidates should be aware that either simply rewording the question or an earlier answer cannot be given credit.

Question 2

(a)   This is a scenario based question as it says quite clearly in the stem of the question that it refers to customers' bank statements. In a question like this that asks for a computing technique to be related to a particular application, the method of answering it is very important. If a candidate was to ignore the fact that the question was asking about a batch processing system and simply talked about banking, very few people would argue that a point that said 'banks provide ATMs' should be marked right. It is a perfectly valid point about banks, but has nothing to do with batch processing. Similarly, to say that 'operators are not needed during batch processing' is a perfectly reasonable point about batch processing, but what has it to do with bank statements? In this sort of question candidates should consider the standard points about batch processing and then decide which apply to bank statements. A good answer would be 'operators are not needed during batch processing of statements because all the details are present on the files so no outside interference is necessary'.

(b)   A standard question about file access that has been asked before in various guises. Most candidates missed the wording in the question which makes it clear that it is necessary to justify the choice in relation to both uses of the file, not just one.

Question 3

This was normally well done. However, there were two types of common mistakes. The Examiners could understand candidates who concentrated too much on the documentation side, despite the question saying 'when writing a program'. They had less sympathy with the small, but significant, group of candidates who explained three of the stages of the system life cycle.

Question 4

Considering the fact that they are standard definitions, there should have been a higher proportion of candidates scoring well in part **(a)**. However, the concepts concerned in part **(b)** are very much more complex and it was very encouraging to see the large number of candidates who showed by their answers that they had not simply learned the definitions, but that they understood the principles behind random access to records.

Question 5

The definition of a protocol is now well known, but the explanation of features is less convincing. Again, there was a complication here. The question said specifically that the answers should be about features that are necessary for the successful transmission of the data, not just any points about a protocol. The implication is that an answer which suggested the need for the type of codes to be standardised between the devices was not acceptable because the transmission would still take place anyway, it is just that the data that was transmitted (successfully) would not be understood, but the transmission was still successful.

Question 6

This question, with the notable exception of a few scripts, was poorly answered. This has also been true in the past and it might have a lot to do with the fact that systems such as that described in the question are totally out of the experience of the candidates. Taken as a piece of bookwork the responses in **(a)(i)** were very disappointing. There are no hidden surprises here, simply the ideas of knowledge collection, storage, manipulation by the inference engine using rules in the rule base and an interface to output results. The Examiners find difficulty in understanding why candidates find this so hard to enunciate. However, there is justification for candidates finding the **(ii)** difficult because applying this knowledge to a given application is a very high level skill, so the poor answers were to be expected from all but a few candidates. As reported every time a question is asked about the effect of the introduction of technology on the humans involved, candidates are only too happy to mention negative effects like redundancy, but positive effects like learning new skills are generally ignored. It is a pity that the perception of technology in the real world is such a negative one among the people who are going to be most affected by it.

Question 7

Most candidates were happy to give the methods of information gathering, but were unable to offer convincing advantages and disadvantages of each method. Most candidates offered responses that were governed by workers being too scared to speak their minds – a sad state of affairs for society. Candidates should remember that in a question like this, with three methods and advantages and disadvantages, the Examiners are looking for comparisons rather than just any comment that could apply to all methods. For instance, the most common advantage given (for all methods) was 'so that the analyst can find out about the system'.

Question 8

(a)   Some good answers here, but few took any notice of the fact that there were five marks, and consequently they gave answers which did not contain five points.

(b)   There are still far too many candidates who use proprietary brand names, these will not be credited. This is an unfortunate way to lose four marks.

Question 9

Verification and validation are standard terms that should be understood at this level. There are many candidates who confuse them and there are others who still make statements like 'verification and validation are used to make sure that data is correct'. Centres are advised that this topic could do with some extra work because too many candidates do not understand it.

Question 10

HCIs are clearly an important part of a computer system and are afforded a prominent position in the syllabus. If questions are asked about GUIs or about command line interfaces, candidates seem to have little trouble. However, any of the others mentioned in the syllabus seem to have the opposite effect. Candidates should understand the characteristics of each of these interfaces, not just the two standard ones.

Question 11

This question is being answered far more confidently by most candidates than it used to be. The distinction between the two is now well understood and Teachers can take the credit for this because it never used to be the case. However, relating either to the needs of a particular application is still poorly responded to. Candidates should be able to answer questions like: Why? When? How often? By whom? On what? For each of the two techniques in a given situation, and if they think in terms of those questions, they will automatically earn the marks.

Paper 5217

Structured Practical Tasks

General comments

Most candidates presented well-organised scripts that clearly showed the solutions to the tasks. There are now relatively few candidates who treat the tasks as full-scale projects and Centres are thanked for ensuring that their candidates do only what is required by the question paper.

There remain a number of candidates (from a small number of Centres) who persist in providing part or all of their solutions on floppy disks or CDs. This is unacceptable. Moderators will not use these disks when checking marking; they will look only at the evidence presented as hard copy. This may then mean that some candidates' marks are considerably reduced.

Centres are reminded that all work must be collected from candidates before opening the mark scheme. Candidates must not be shown the mark scheme.

Most Centres are now using the Practical Tasks Assessment Forms provided and this is very helpful to the moderation process.

However, some Centres continue to have problems with the marking process itself. An Assessment Form should be completed for each candidate. Where there is clear evidence in the hard copy of the candidate's work that a mark point has been achieved, a tick should be placed on the grid next to that mark point. The ticks for each part of a task should then be counted. The ticks counted are the number of marks to be awarded for that part of the task (subject to the maximum mark available for that part of the task). The marks should not be proportioned in any way, nor should fractions of marks be given. Particular care should be taken not to exceed the maximum mark in any part of a task.

Most Centres are now carrying out the various administrative tasks required by the Board and are thanked for this. Nevertheless, a reminder may help new Centres. In addition to the scripts, the Moderator should receive one copy from the three-part duplicated MS1 mark sheet and individual Practical Tasks Assessment Forms (marking grids) for *every* candidate at the Centre. These documents are essential to the moderation process.

Centres must check the addition of marks on the Assessment Forms very carefully before transcribing them on to the MS1. In every session there are many examples of incorrect totalling of marks and inaccurate transcription of marks on to the MS1. Candidates may be put at a disadvantage by their Centres where this exercise has not been carried out accurately.

Comments on specific tasks

Task 1

Software development and implementation of a database

Many candidates produced good solutions to much of this task.

(a) Most solutions had suitable keys, attribute names and data types, although some included unnecessary or inappropriate attributes (candidates were not penalised for these). As in previous sessions, however, many failed to state adequately the *purpose* of the attribute and many Centres did not mark this accurately. It is not sufficient to simply re-state the attribute name. The question asks *why* each attribute is being included in the table. The Board has noted the problem caused for candidates at a small number of Centres by the subdivision of the address field in the mark scheme. Such a subdivision is common in databases, not least to aid searching, and all Centres should assume that it will continue to be expected where appropriate.

(b) The same comments about the purpose of attributes apply here as in **(a)** above. Centres should encourage candidates to select the *most appropriate* data type for their attributes. For example, where cost is used as an attribute, *currency* is the appropriate data type; candidates should not use *numeric* instead of *currency*, even if they restrict the data type to two decimal places.

(c) Most solutions had sufficient data in the Customer and Component tables, although a small number did not show all the attributes originally defined. In such cases the marks could not be awarded. Many candidates produced CustComp tables with very limited data. Previous mark schemes have indicated to Centres that such link tables should include at least one of each tuple from each associated table. This is one reason why limits are suggested for such tables in the question.

(d) This question continues to cause problems in that many candidates fail to include what is required in their hard copy. In order to prove that a validation check has been created, candidates must show what data has been input and what has happened after it is input. Generally, it should be possible to see both the input data and the result at the same time. A screen shot would be appropriate for this. It should also be possible to include screen shots of the table designs showing the masks or other validation rules. When producing a report that abstracts information from a database (as required here), the candidate should also show the query design as well as the result of the query. The output alone is not sufficient to earn the marks. The report produced should also match up with the CustComp table and should be in printed hard copy form; a screen shot is not acceptable in this case.

(e) The same comments apply as in **(d)** above.

Task 2

Algorithm trace, without implementation

Many candidates had problems with this task.

Some clearly found it too difficult and were unable to follow the algorithm correctly. Generally this was either because they switched from the inner loop to the outer loop without realising it, or because they mistook the index number of the array they were dealing with and looked up the wrong data as a result.

Others appeared to have followed the algorithm correctly for at least some of the way, but had completed the rows of the table inaccurately. The question told candidates to work from left to right in the table and from top to bottom. This meant that if the next value to be entered in a cell was to the left of the last cell entered, then it was necessary to move down a row. Candidates who failed to do this tended to generate a host of errors and scored low marks.

Centres should not be concerned that some candidates failed to complete this task correctly. It is not expected that all candidates will score highly on all tasks. Should they do so, there would be no discrimination possible in the grades for the paper.

Task 3

Software development and implementation of a program

(a)   The user interface was generally well done, though many failed to include an on/off button. Presumably this was because they did not remember that the task was asking them to *simulate* a calculator, rather than implementing a computer program to do the job of a calculator. Some Centres wanted to give candidates credit for the quality of the interface. Such marks are not normally found in mark schemes because of the subjectivity involved in their assessment, but it would still be expected that the principles of good interface design would be taught as part of the syllabus.

(b)(i)   Most candidates were able to implement their design sufficiently to score the three marks available for the program code. Few candidates scored well for the annotation marks, although many Centres gave credit where it was not due. Where a program is fully annotated, it should be possible to strip out the code and for a broadly similar program to be written using the original programmer's comments as a *detailed* guide to what is required. The majority of candidates in a large number of Centres did not merit even one mark for their annotation.

  (ii) Candidates are expected to design a test plan before they start testing. Indeed, they should be able to produce one before they start programming. The tests that were required were clear in the bullet points at the beginning of the task on the question paper. The test plan is best presented as a table and should, as stated in the question, identify sets of test data and give the expected and actual results. These test data should then have been used in the testing required by part **(iii)**.

  (iii) Evidence of testing must follow the test plan from **(ii)**. The mark scheme identified the minimum requirement here, which was that the input data and the result should be clearly shown. Candidates who wrote that, for example, they were going to test the addition sum 2 + 5, then gave a single screen shot of a display showing the result of 7, could receive no mark for that test. To receive credit, it was necessary to show screen shots of the inputs as well as the result

> **Paper 5218**
>
> **Further Systems and Software**

General comments

The paper appears to have been accessible to candidates, there being no questions that seemed to prove difficult to decipher or understand the meaning of. Many candidates had difficulty with some of the questions but that is to be expected, otherwise there would be no differentiation between candidates. However, the more able candidates were able to successfully attempt even the harder questions while there was plenty that less able candidates were able to answer in other questions. There is, however, still a tendency for some candidates to sit the exam without being fully prepared for the questions which they are going to meet. These candidates would certainly gain from a more thorough and goal-oriented preparation before sitting this exam, which would spare many of them the feeling of failure.

There was no evidence of any candidates suffering because of time trouble and all questions were subject to the full range of marks from zero to the maximum for the question, so there was nothing that was not attainable and all questions proved challenging to at least some candidates.

The ability of such young people to understand and answer complex questions in a language that is not their first language in many cases, continues to be a source of wonder to those of us that mark the work and our thanks and appreciation should be passed on to the candidates for their efforts to make the papers presentable and understandable. Thanks are also due to the Teachers who, session after session, manage to prepare the vast majority of candidates to such an excellent standard.

Comments on specific questions

Question 1

Responses to this question were very good if the candidate read the question. It was quite clear that the question referred to facilities of electronic mail which can help in the management of a message that has already been read by the recipient. However, many candidates simply listed four features of email, while others described the mechanics of how email messages are sent from one person to another. The answers which were considered acceptable as responses to the question as set are listed on the published mark scheme and attention of Centres is drawn to this for the acceptable responses to this and all other questions on the paper.

Question 2

It was encouraging to see that the vast majority were able to produce an ER diagram of some description. Many included the company as an entity. This did not really fit the question, but was not penalised in any way. Responses tended to be in one of three groups. There were the ones that used the three entities highlighted in the question, but did not understand the significance of the many to many relationship. The second group were the candidates who recognised this relationship and inserted a link entity between *garden* and *plants*. A number of these candidates could then go no further because they got the new relationships the wrong way round. The third group were able to add descriptors of the relationships to the diagram and score full marks. This differentiation across the questions mirrored the final result very closely and hence this question was an excellent discriminator.

Question 3

(i)   There were few good responses about fragmentation. Most candidates assumed that it was a positive technique for memory management rather than it being a result of a certain degree of misuse of memory. Even those candidates who had the right concept rarely managed to get past the idea of gaps in memory.

(ii)(iii)   These proved good discriminators at the lower grades. Most candidates were able to score the marks for the memory/job/data being divided up, but comparatively few realised that that caused a problem in being able to find things and ultimately how that problem would be solved.

(iv)   Many candidates referred to the hard disk in total rather than a reserved area. Use of cache memory or mention of disk threshing were very rare, they were not needed for the answer to gain full marks, but were worthy of credit if offered.

Question 4

A large proportion of candidates failed to score any marks here, having some fairly imaginative ideas about the meanings of the terms. Most, however, were able to score some marks for the basic concepts, but the more complex issues like how the addresses need to be managed when pages of code are loaded into previously undetermined areas of memory were more difficult. This was not surprising in a question which was intended to be more difficult.

Question 5

(a)   The cycle is now quite well understood by all but the weakest of candidates. This is a vast improvement over the state of affairs that we had just a few years ago, and my thanks to the Teachers for the obvious efforts that they have put into this work on behalf of their candidates. There are still a sizeable proportion of candidates who believe that the PC holds the next instruction, but at least there are now very few who think that it holds the number of programs that have been run. The basic process is now well understood, but there are few who can relate what happens during a jump instruction, and even fewer who realise that the reset simply refers to the return of the cycle to the first stage. Very few mentioned the need to respond to interrupts or how they are recognised.

(b)   The word "parallel" is one of those words that immediately give rise to Pavlovian reactions among candidates. Most talked about parallel running when implementing a software solution, or to the parallel transmission of data. Those who showed an understanding of the term were normally able to earn the mark for the advantage, but were not aware of there being a disadvantage.

Question 6

(a) Encouraging numbers of candidates scored full marks here, though it was surprising to see the number who threw away a mark by not putting the leading zero in the binary number in order to make it eight bits.

(b) Many candidates were totally confused by the question; however the Examining Team were pleasantly surprised to see the number who scored well here.

(c) Explaining the details here is difficult and is made doubly so by any difficulty with English, but despite this it is a pleasure to report that a healthy proportion of candidates understand the principles well.

Question 7

(a) This was well answered.

(b) Most who provided answers managed to get the two types of parameter passing the right way round, but the feeling was that many failed to get more marks because of a failure of exam technique. This applies to most questions, but particularly here. Candidates should be aware that in a question that has five marks available, there must be five points made. Otherwise, however well the answer is written, the Examiner cannot give all the marks. Candidates really would have benefited from answering this question as a series of bullet points rather than trying to write prose. Responses that scored maximum marks were almost always in bullets.

(c) Very few candidates knew what was expected here and many were ignorant of the idea what a stack was. Even with better responses there were very few that considered a pointer of some description, showing where the top of the stack was, was of any worth. This was intended to be the hardest question on the paper and so it proved.

Question 8

(a) Some good answers here, many relying on general knowledge rather than computing, but making sound points nevertheless.

(b) Marks awarded here tended to be lower than the Examiners had expected. It was almost as if the candidates were scared of writing down the obvious points of quantity of data, calculations, and the need for speed because of the time sensitivity of the results.

(c) Intended to be a nice simple end to the paper, though many discussed the benefits of videoing a talk and then sending the video to each of the stores. Examiners understood the confusion with the videos, but where did the idea of 'stores' come from?

<div style="border:1px solid black; display:inline-block; padding:8px;">

Paper 5219

Programming Project

</div>

General comments

This report provides general feedback on the overall quality of project work for the Diploma in 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 candidates showing evidence of researching a problem beyond their school or college life. Again, Centres are reminded that the programming project must involve the use of an object-oriented programming language and may also involve the choosing and installing of hardware. Centres are also reminded that candidates need to identify opportunities to develop and deploy a limited set (5-6) of library elements in their solution. The requirements are clearly set out on pages 25 to 31 of the syllabus. The guidance on marking projects on pages 32 to 40 can also act as a useful checklist setting out the expected contents of each section.

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

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.

The use and development of library elements, set out in the separate sections required in the report, is essential to the object-oriented approach required for this component. In the May/June session some Centres had ensured that their candidates had made good use of library elements and followed this approach, but in the October/November session this approach was unfortunately not evident.

Project assessment and marking

Most assessment was generous particularly where evidence of user involvement and the identification and production of library elements were not evident in the candidate's report.

Centres are reminded that the mark scheme for the Diploma project work is not the same as the mark scheme for the A Level project work. This component is marked out of 80 and there are marks in specific sections for the use and development of Library routines. Some Centres had erroneously used the A Level mark scheme and marked out of 60, other Centres had given percentage marks using a Centre-devised scheme.

Centres must use the mark scheme set out in the Diploma Syllabus and include a detailed breakdown of the marks awarded section by section together with a commentary as to why marks fit the criteria. This greatly aids the moderation of the projects allowing Moderators to identify why marks have been awarded. Moderators cannot make informed comment as to the accuracy of the Centres' marking of each section without this breakdown of marks.

Comments on individual sections

The comments set out below identify areas where candidates' work is to be praised or areas of concern.

(a)   Definition investigation and analysis

(i)   Definition – nature of the problem

Most candidates could describe the organisation and methods used but only the best 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 of the library elements**

This section was not present in the majority of reports. It should include the following elements.

- Nature of the solution – A clear set of objectives with a detailed and complete design specification, which is logically correct. There are also detailed written descriptions of all processes/sections and a clear, complete definition of any data structures. The specification is sufficient for someone to pick up and develop appropriate library elements. The library elements have been designed to be reusable and easily configured.

- Intended benefits of the library elements have been identified and explained.

- Limits of the scope of the library elements.

(c)   **Software development, testing and implementation of the library elements**

This section was not present in the majority of reports.

- Development and Testing of the library elements – the Examiner must be left in no doubt the library elements actually work in the target environment. Candidates should provide program listings in the form of printouts. Data structures should be illustrated as part of the listings where appropriate, detailing their purpose. There should be a full set of printouts showing input and output as well as data structures. All hardcopy should be fully annotated and cross-referenced. A full test plan, with evidence of each test run should be present in the report, together with the expected output for each library element. The test plan should cover as many different paths through the system as is feasible, including valid, invalid and extreme cases.

- Appropriateness of structure and exploitation of available facilities used in the production of the library elements – some discussion of the suitability of methods used for the particular system should be included. Some recognition and discussion of the problems encountered and actions taken when appropriate should also be included. A log of such problems should be kept.

(d)   **Documentation of the library elements**

This section was not present in the majority of reports. As many programmers work as part of a programming team, the documentation for the library elements is intended to allow the candidate to demonstrate their ability to work as a part of such a team.

- Technical – Much of the documentation will have been produced as a by-product of design and development work and also as part of writing up the report to date. However, a technical guide is a stand-alone document produced to facilitate easy maintenance and upgrade of a system. The contents of the guide should, where relevant, include 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. Candidates should include a guide to the interface to the library routines – parameters, public and private data structures, formats etc. All parts of the guide should be fully annotated since this is important for subsequent development of the system. The specifications of the hardware and software on which the system can be implemented should be included.

- Clear guidance, as friendly as possible, should be given to allow the incorporation of the library elements in other solutions. Details of the public interface should be provided for each of the library elements. Some mention here of the relationship between the elements and the data they deal with may be relevant. The user guide should be well presented with an index and, where necessary, a glossary of the terms used.

(e)   **Design of the main solution**

     (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 with the user. 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**

     In order to obtain full marks for this sub-section, candidates need to describe the merits of the intended system not just provide a list.

     (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.

(f)   **Software development, testing and implementation of the main solution**

     (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**

     Few candidates included an implementation plan. This should contain details of user testing, user training and system changeover that have been discussed and agreed with the user. These details need to be clearly related to the candidate's own project not discussed in general terms.

     Evidence of user testing is essential if high marks are to be awarded for this section. To obtain high marks candidates should include photographs of the user testing the new system, printouts of the testing together with signed comments from the user and/or a letter from the user commenting on the tests and their results.

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

     Candidates should discuss the suitability of both hardware and software at this stage. Few candidates kept a log of any problems encountered together with details of how these problems were overcome. Any system developer encounters problems; these problems need to be noted together with the corrective action taken.

(g)   **Documentation of the main solution**

     (i)   **Technical**

     Very few candidates produced 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. Candidates need to annotate all parts of this guide since this is important for subsequent development of the system. The specifications of the hardware and software on which the system can be implemented should also have been included.

     (ii)   **User**

     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.

www.xtremepapers.net

(h)   Evaluation

Many candidates did not consider the user's satisfaction with the system developed and then evaluate the response.   Unless this evaluation is completed in detail high marks cannot be awarded. Page 39 of the syllabus clearly sets out the required contents of this section.

(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, 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

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