AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

General Certificate of Education

Information and Communication Technology   5521/6521

Specification

Examiners' Report

2005 examination – June series

Contents

GCE in Information and Communication Technology

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General Comments

In this June series of the examination, there was clear evidence that many candidates were well prepared for the unit(s) they were sitting. It was pleasing to note that very nearly all candidates taking the AS and/or A2 units answered all of the questions on the papers.

All units showed a good range of marks had been achieved, with ongoing improvements in the standard deviation.

However, the continued use of brand names of specific software packages is a poor examination technique that seems to be on the increase again after a period of decline. Candidates should respond to questions with reference to generic types of software. It is clearly stated on the front of all GCE ICT question papers that, '… *the use of brand names will **not** gain credit.'* Candidates are reminded to read the front of the question paper before reading the questions themselves.

In order to enable candidates to understand questions more clearly, some questions included examples that were designed to help the candidate recognise the topic being examined. However, some candidates appeared to have failed to read questions thoroughly; some even offered the example given in the question in their own answer, thus depriving themselves of credit-gaining opportunities.

For A2 units, especially ICT 4, candidates are expected to have a basic understanding of how ICT is used and managed in organisations of different types and sizes. Those candidates with this basic understanding perform far better than those who have not spent time relating the various topics to a range of organisations.

Unit 1 Information: Nature, Role and Context

Question 1

This is a question which has been asked on many occasions. Unfortunately, many candidates did not get high marks, mainly for the following reasons.

- For part (a), they did not give definitions or examples that recognised that data is plural.

- They did not give examples in an ICT context.

- For part (c), knowledge, they gave examples which were based on the traffic light scenario i.e. knowledge means you know that if the light is green you can go through the traffic lights.

- Few candidates could define knowledge in an ICT context. Some candidates defined it simply as a set of rules, but did not say that these rules are applied to information. A good definition would be, 'Knowledge is a set of rules and concepts that can be applied to information to gain understanding.'

Question 2

Nearly all candidates recognised this as 'a garbage in - garbage out' scenario and therefore gained two marks for defining that a mistake had been made during data input and therefore the information that was presented in the bill was incorrect. However, many candidates did not specify that processing took place. Some candidates again did not use the terms *data* and *information* in the right context.

Question 3

Again a question that has been asked before with the examples related to different scenarios. Most candidates gained two marks for defining the requested personal qualities of an ICT professional. Those who failed to gain marks did so because they defined technical skills. However, the question clearly stated that examples must be in context and asked when each quality would be needed to help people with little or no understanding of ICT systems. No mark, therefore, was available for an answer that simply stated in answer to the latter, 'to produce a user guide.' However, a mark would have been given if the answer was, 'for producing a clear user guide which would help users to understand how to use the system.'

Question 4

All candidates answered part (a) well.

Part (c) related to the use of credit cards to order goods over the Internet. It was answered well, on the whole, except for a few candidates.

Part (d) asked for measures the company could take to give customers confidence. Some candidates failed to specify measures and therefore did not gain any marks. Other candidates gave measures such as encryption, but failed to gain the second mark for specifying how the measure would work.

In part (d) the question asked for advantages to the company**.** Many candidates gained one mark for stating, 'saves employing staff,' but did not gain the second mark for describing the advantage to the company i.e. (in this example) they failed to add that this would save the company money.

Question 5

Question 5 asked for three disadvantages to a company/organisation of using e-mail for business communications. A disadvantage can only be a disadvantage if measured against another method. Many candidates did not answer the question and made simple statements such as, 'people might not open their e-mails straight away,' or, 'the e-mail might be sent to the wrong address,' without describing why this was a disadvantage. Very few candidates gained full marks.

Question 6

Part (a) was answered well and most candidates knew about the use of browsers and search engines and could distinguish between them.

Part (b) asked for concerns about the information received, not about the dangers of its usage. Many candidates wrote that the information might be out of date and therefore the research would be wrong and they would have poor marks. Candidates gained the mark for out of date, but they needed to explain *why* it might be out of date in order to gain the second mark. For example, the website had not been updated for several years. Most candidates gained high marks on this part.

Question 7

For part (a), a lot of candidates mistakenly defined the difference between internal and external threats as being those which occurred inside and outside the computer systems, rather than inside and outside the company/organisation.

In part (b) many candidates stated measures which protect against internal and external threats, but failed to gain the second mark by describing how these measures protected the Information Systems. For example, an answer for external threats that a firewall prevents hacking is worth only one mark. To gain

the second mark candidates had to describe that the firewall prevents access to/corruption of data from outside the company **(**hackers can operate inside and outside companies).

Question 8

Although this question was answered well by some candidates, there was still a considerable number who failed to identify work practices or measures. For example, to state, 'that a chair must be at the right height,' is not stating a design feature, nor is, 'the software must be easy to use.' Some candidates who identified features unfortunately then failed to identify the risk the feature prevented against.

Unit 2 Information: Management and Manipulation

Question 1

This question was generally well answered with the majority of candidates identifying three formatting facilities. A minority of candidates either identified other word-processing facilities that could not be credited - such as cut and paste - or gave several examples of one facility - such as underline and embolden which are both font styles.

Question 2

This question was also generally well answered with most candidates identifying two alternative methods of preventing access to data. Some candidates lost a mark by giving two examples of the same method e.g. finger print recognition and retina scans are both types of biometric check.

Question 3

This question required candidates to identify items needed for recovery procedures other than the backed-up data. Those few candidates who identified any items from software, hardware, communications, 'staff that know what to do' and also, '…the need to test out the procedures,' gained marks for this question. Candidates should be reminded that they need to be able to identify recovery procedures as well as backup procedures.

Question 4

This is a question on a topic that is still relevant to working practices in ICT and one that has been examined many times before. Those candidates who had studied the topic usually gained good marks for batch processing, but only the better candidates gained full marks for the transaction processing part of this question. However, many candidates gave incorrect non ICT references describing mass production of goods rather than batch processing of data or they described a commercial transaction without following on to explain that each set of data from a user is processed as it is submitted before the next set of data is dealt with.

Question 5

A substantial number of candidates were not sure what a natural language interface is. A natural language interface is one which allows the user to communicate with an ICT system using the language of the user. One example of the use of a natural language interface is to allow querying of a knowledge base directly in English (or another language), although complex or poorly phrased requests may not obtain the required results. Those who had studied the topic usually gained good marks but many candidates wrote about voice recognition or a graphical user interface without describing how natural language is used in these.

Question 6

For part (a), the majority of candidates could cite data redundancy and data inconsistency as two problems. Better candidates used good examples to aid their descriptions.

In part (c), those candidates who had used a relational database often gave three, or more, good answers. Queries, forms and reports were the most common features correctly identified.

Question 7

In part (a), few candidates could state three functions of a scanner driver and many confused the functions of a driver with those of installation software. The driver provides the interface between the operating system and the scanner, translating commands from the operating system into instructions that the scanner can obey and vice versa.

Part (b) was answered well.

Part (c) was answered well, apart from candidates who 'forgot' that the question stated the drivers were supplied on CD-ROM and gave this as an alternative.

In part (d) many candidates did not realise that OCR software converts a page of text from a scanned image into editable text and incorrectly gave answers about the advantages of scanned images. Better candidates correctly identified that alterations to documents could be made without having to retype the whole document.

Question 8

In part (a) of this question better candidates gained full marks. However, a very common mistake was to use a brand name for the software e.g. quoting 'Word' instead of 'a word-processing package'. Candidates are reminded that the use of brand names is not credited. A few weaker candidates misread the question and described some items of hardware.

For part (b) most candidates could name two types of printer. A few mistakenly quoted 'LaserJet', which is a brand name. Quoting an advantage for each of the printers proved more difficult with many candidates relying on the cheaper, faster type of answer without the qualification required to gain a mark. For example, 'an inkjet printer is cheaper,' was not sufficient to gain a mark but, 'a colour inkjet printer is cheaper to purchase than a colour laser printer providing similar quality printouts,' clearly identified a specific advantage.

Question 9

For part (a) most candidates could identify three appropriate fields.

Part (b) was generally well answered with the majority of candidates able to describe suitable validation checks, even if they couldn't always name them correctly.

Question 10

It was pleasing to see that most candidates read this question carefully and only quoted advantages or disadvantages to the candidates. However, not all candidates restricted their answers to the use of a LAN and incorrectly identified advantages or disadvantages of using a WAN or the Internet. Advantages or disadvantages to the candidates of intranet use were perfectly acceptable.

For part (a) most candidates could identify two advantages of using a Local Area Network (LAN) but only the better candidates described why it was an advantage. For example, 'candidates can use any

terminal on the network instead of a specific computer,' is an advantage but this could be expanded upon by giving a reason such as, 'as files containing candidate work can be stored on a network drive.'

In part (b) disadvantages proved more difficult to identify but most candidates could specify at least one. Some candidates were not careful enough when identifying exactly what the disadvantage was. For example, a common incorrect response was, 'if the server goes down then none of the terminals will work.' This type of response needed to be more specific so if candidates had written, 'If the server goes down then none of network resources will be available to the user of that terminal, although the terminal could be used as a stand alone machine,' they would have gained the mark available.

Unit 3 The Use of Generic Application Software for Task Solutions

As in previous exam series the majority of coursework seen was implemented using either spreadsheet or database software. Increasingly, however, centres are presenting work that is browser-based, often utilising Macromedia's Dreamweaver or Microsoft FrontPage. These projects are focussed on presentation of information in a static form but, pleasingly, centres have attempted dynamic sites utilising ASP or addressed some interface issues with some additional software e.g. Flash or Fireworks.

The problems selected were generally suitable for the requirements of the specification, which demands only a task-based solution. The resulting solutions were generally appropriate but candidates should remember that they are working towards generating a useable solution in the software selected, and they should ensure its correctness with appropriate testing.

The use of software tools to present the candidate's reports has continued to add to an improvement in the quality of the documentation which allows the evidence provided by the candidate to be more easily and accurately evaluated. Candidates should be reminded though that these reports should be securely bound before posting to a Moderator.

Specification

An issue with the specification which has caused some concern this year is the number of candidates who attempt systems and so incorporate considerable work from the ICT 6 analysis work at this early stage. Whilst candidates are not penalised for this extra work, candidates can place additional complexity and unnecessary burdens on themselves when the specification derives marks from design and testing as well specifying the problem.

A number of candidates failed to consider the input, processing and output needs in sufficient detail, particularly with reference to the user requirements stated. For example, if a discount is to be applied to a customer order then it would be expected that the candidate states exactly how the discount is to be calculated. Equally, if an image needs to be transformed for presentation in a browser then the candidate needs to be specific about how to change that image and within what parameters e.g. resolution.

Candidates should again be reminded that in order to gain a mark against the criteria there has to be *evidence* present to support their claim. For example, a third party implementation must have all major aspects present. If a project implementation shows itself to be heavily reliant on a macro and no design exists for this macro then the mark section for third party implementation cannot be selected.

It is critical that candidates test the major functions of their solution. For example, if one aspect of the project is to search a file for available dates in a holiday cottage website then this function needs to be checked to show that it can return the correct output. The candidate would then be expected to declare a range of search criteria and have a data set available to show the expected outcome of those searches. Some candidates had clearly spent far too much time testing issues such as validation at the expense of the critical tasks the solution was intended to deliver, and so failed to deliver a full and effective test plan.

Implementation

There were many good task solutions seen where the candidate successfully and appropriately utilised a wide range of features of the software and so saw the full range of marks awarded in this section. However, there was also a number of implementations seen which lacked the appropriate exploitation of the functionality of the software used and did not ultimately achieve an appropriate solution. Whilst the marking of ICT 3 is the accumulation of marks from a number of differing aspects, the main thrust of the AQA specification is to ensure that candidates do have a sound appreciation of developing a working ICT solution and ultimately do acquire, and can prove, that they possess the skills to achieve such a solution.

A commentary is expected in this section that details all the software features used, and the reasons for using them, by the candidates with clear hardcopy / screenshot evidence. It is only necessary to include one sample of each type of feature, rather than repetitively show the same feature many times.

Evidence for the quality of the implementation can be taken from the testing section, but it is critical for the candidate to provide documentary evidence to prove that he/she has met the assessment objectives. There must be clear proof to establish that the solution described has been built, and to show what skills and techniques were deployed. For example, spreadsheet solutions must include printouts of the formulae used where the cell references can be clearly identified and checked were necessary.

Testing

It is critical that the fundamental purpose of the project is fully tested and that hard copy evidence of this is included when the coursework is submitted to the Moderator. Centres are reminded that annotated screenshots or printouts are required to prove that solutions function as claimed. In some cases the images were over cropped and were too small to read.

It was always the intention that testing should take place as the solution is developed and thus candidates should show the problems that they encountered, the steps they took to solve these problems and any subsequent retesting to show success. Properly showing corrective action is still too often ignored or attempted superficially merely to fulfil marking criteria, rather than showing an understanding of the need for such work.

With browser based projects it is wise for candidates to be sure what stages are needed for a reliable test, other than simple navigation tests. For example, developing a website for a local historical site open to the general public would undoubtedly require testing for accessibility compliance.

Evaluation

Many candidates now give clear objectives for their solutions as part of the end user requirements and then assess how well their solution functions. This certainly helps candidates to produce well-designed evaluations. Centres are reminded though they can teach candidates what the necessary criteria are for a successful ICT implementation; the quality of the evaluation work comes from the candidate relating that theory to their own scenario.

User Documentation

In this section candidates are encouraged to show the main tasks the solution delivers and to explain clearly, in a form suitable for the prospective end-users, how they would operate the software to achieve that task. To this end it is therefore very helpful to have clear screen dumps which show clearly where and how the data required has been entered.

This section is often well done with many candidates producing sound, good quality user documentation which demonstrates well the normal use of the system. Note that the provision of on-line help is quite

valid and coursework supervisors should include notes on the Candidate Record Forms to ensure that the Moderator is aware of this.

A common fault continues to be showing how to *make* the solution rather than how to *use* or *maintain* the solution. For example, for websites it may be essential that the focus is on how to upload the sites or, if the end-user is intending to take over maintenance, how to maintain the site with updates. More realistically it may be how to handle the data collected by the site, which offers the opportunity to use skills from different software packages (e.g. e-mail/mail merge), but not how to alter the fundamental design of the individual pages.

Unit 4 Information Systems within Organisations

Question 1

Many candidates scored well on this question, offering tangible deliverables, with a correctly named stage in the life cycle. Those who gave an activity, such as 'beta testing' or 'evaluation' did not gain a mark, whereas 'testing results' or 'evaluation report' did gain a mark. The mark for the life-cycle stage was dependant upon having a suitably named deliverable. Some candidates could not name life-cycle stages, offering instead 'the first stage' or 'after the analysis stage'.

Question 2

In part (a), candidates could gain the marks in various ways, but most opted for the standard definition of a Management Information System (MIS). This could gain two of the three marks available and only if they expanded and gave an example of a strategic decision did they gain the third mark. Other candidates attempted to identify a named strategic-level system and often gained all 3 marks by doing so. Candidates offering tactical or operational level systems or activities could gain no credit.

For part (b) the command word used was 'State', so lengthy explanations were not required. There was a small, but worrying, cohort of candidates who again did not know that the two levels required were 'tactical' and 'operational'.

Question 3

The word 'change' was in the question and was intended to guide candidates to the correct section of the specification (13.5). Candidates who realised this generally scored well.

Question 4

This was a question where candidates were required to show their understanding of the organisational use of information. References to 'good' or 'poor' structures, or to 'good' or 'bad' information did not gain credit. However, many candidates could offer two different effects, such as speed or accuracy, which gained the marks, backed up by explaining why in relation to organisational structure. Creditworthy examples of answers are:

- 'A hierarchical structure to the organisation may have the effect of distorting information as it is passed down through so many layers;' and

- 'A flat structure to the organisation may mean that information is passed quickly between the manager and all the workers, as there are few layers for information to pass through'.

Question 5

This question was generally answered very well, with a significant majority of candidates gaining all the marks. Some candidates, however, could do no more than discuss a selection of the principles of the Data Protection legislation, often without stating an action that could be taken to ensure that the principle was upheld.

Question 6

Candidates who had read the question properly and understood the requirements to show an action and how it would help a successful development could gain full marks, and many better candidates did. Some repeated the management involvement given in the stem and some showed little evidence of having studied the MIS development and introduction area of the specification. Unfortunately, many had misread, or misunderstood the topic and offered answers outside of the scope of developing an MIS.

Question 7

Although many candidates scored full, or almost full, marks for this question, it was obvious from many answers that the concepts of internal and external information *needs* were being confused with internal and external information *sources*. However, in order to be fair to all candidates, both interpretations were credited.

Part (a) was generally well answered, with most candidates gaining marks, and most gaining at least four of the six marks, except in cases where only one example was offered. Marks were usually lost by candidates either for not being able to name a job title in response to the first bullet (who needs the information) or because they used 'manager' on its own and out of a context.

Part (b) caused some confusion, although as long as either the 'who' or the 'what information' were external to the organisation, the other marks were possible. However, despite some difficulties, many candidates scored full marks for this part of the question.

Question 8

Only a few candidates answered very well this question on the social, moral and ethical issues facing an ICT professional. Candidates tended to focus on non-ICT issues or on personal issues, whereas the AQA specification, and therefore the requirements of the question, focus on the organisational issues over which the ICT professional may have some control or involvement.

Question 9

Many candidates did not appear to know the part of the specification that pertains to the corporate information systems security policy, and answered the question as if it was about a code of practice, thus gaining very few marks in the process.

In part (a) most candidates gained a mark for writing that there would be rules or guidelines to follow, and some gained a second for writing that it would have a list of staff responsibilities.

For part (b) a significant minority of candidates did manage to remember the list from the specification to gain all four marks, but most gained one mark for giving an example of a procedure to prevent misuse (e.g. use of passwords or access levels). Some candidates gained a further mark for offering a version of disciplinary procedures.

In answer to part (c), many candidates gained four or more marks of the six available by describing methods of making staff aware or the corporate information security policy. The context of the question meant that this was intended to be as the new policy was introduced so a method of all-staff awareness

was required (such as training course, a meeting, sending or e-mailing a full copy to each staff member and so on). Allowing for it to be introduced as part of any induction was also credited, but any method that left awareness to chance was not.

Question 10

Many better candidates scored well in part (a) as they showed an understanding that breaking up a project into sub-projects and allocating parts to specialist teams makes the project more easy to manage, test and control. Other marks were found in the fact that having teams working on different parts simultaneously meant that the project might be finished more quickly in terms of a calendar sense, rather than in terms of a time-spent sense, which is not usually the case.

Part (b)(i), concerning clear timescales, posed few problems, with the majority of the candidates gaining both marks for mentioning both stage and whole project deadlines or target dates. Part (b)(ii), regarding the approval to proceed, was more complex for the candidates who did not understand the concept of user agreement and sign-off which allowed the next stage of a project to go-ahead.

Question 11

This was a question where it appeared that over-familiarity with the situation caused some candidates to forget they were writing an essay in response to an A2 ICT question, and instead to answer it in a 'man-in-the-street' style from their own experience as part-time store staff. Unfortunately, this approach rarely was sufficiently technical to gain many marks. The question was answered either very well (with many more than usual candidates easily gaining full marks) or very badly (where candidates gave detailed, but generalised descriptions about 'training' or 'support' together with discussions that were content and/or context free and contained little or no ICT ideas).

The best candidates described methods of training and support first, as advised in the question, gaining many marks for clear, well-expanded descriptions, occasionally with advantages or disadvantages of method. They then went on to make recommendations by staff group, giving succinct reasons. Many had scored all the content marks before completing these recommendations as their comprehension of the topics was so good.

Other candidates gained marks for approaching their answer by staff group and describing the best method of training (not merely naming it, or giving a list of names), and stating why. However, this approach rarely gained as many marks as it seemed to prevent diversity in suggestion – offering the same method of training for many different groups of staff and support always being from their manager. Some staff groups were dismissed as if they didn't matter to their employers. For example, warehouse staff and delivery drivers were treated as if they never touched a computer in their work and, to some candidates, part-time staff were considered not worthy of training.

The quality of written communication was generally reasonable, although a lot of incorrect spellings and many grammatical errors were seen. To gain the higher language marks the essay must have structure and relevance, as well as good use of English. Paragraphs must also be logically and smoothly linked. Well-structured essays often gained all four Quality of Written Communication marks. Many of the poorer essays in terms of content also gained marks for the quality of language as many candidates had a lot to say, and there were many instances of the quality mark being higher than the content mark.

Unit 5 Information: Policy, Strategy and Systems

Question 1

Many candidates were able to gain some marks for this question, although it was rare for a candidate to gain full marks. Unfortunately, there remains a number of candidates who respond to this type of question

by incorrectly referring to physical factors i.e. dealing with lighting, seating etc. or, more frequently now, discussing the senses such as vision and touch, rather than the required psychological factors. Physical factors are not referred to in the specification, and do not gain credit if given in answer to this question paper. Better candidates were able to discuss how human-computer interaction could be used to cater for novice users (through help menus) and expert users (through use of shortcuts).

Question 2

Candidates were normally able to get some credit from each of the two parts of this question. Weaker candidates essentially gave the same answer for both parts but of course could be credited only once. Better candidates were able to differentiate between the parts and gave some excellent explanations of how to transfer data between applications for part (a) and between different computer systems for part (b). Almost all candidates could identify 'copy and paste' as a method for part (a). It was also pleasing to note that a number of candidates were able to write sensibly about Object Linking and Embedding.

Many candidates identified 'e-mail' as a method for part (b). However, only the better candidates were able to identify that e-mail is only really useful as a transfer method when the data is included as an attachment. This is something that should be noted for the future. Weaker candidates also gave Wide Area Network and Local Area Network as examples. At this level, it is expected that candidates will demonstrate a more in-depth knowledge, so such answers gained one mark only.

Question 3

A number of candidates struggled for answers to part (a) of this question, where there continues to be a misconception that, in the context of a computer network, a client is the user or a person. Similarly in part (b),, a server was often defined as a service provider to this client. At this level, it is expected that candidates are able to recognise technical ICT terms such as *client* and *server*, and be able to define and use them correctly.

Part (c) also caused some candidates problems as they responded to the relative merits of a client-server *network*, rather than a client-server *database* as asked in the question. Consequently, many candidates gave responses which discussed items that were more generally network related (such as centralised backup and security which could gain no credit) rather than clearly database related (central storage for consistency, reduction in network traffic meaning only query and response sent). Better candidates were able to respond to this question correctly and gain a high proportion of the marks.

It was pleasing to note that, for part (d), a number of candidates were able to write about the role and function of routers. It is not necessary to answer this in a technical context, as this level of knowledge is not expected for this question paper, but it is expected that candidates will be able to demonstrate that they know what a router does, i.e. pass traffic between networks based on an addressing mechanism.

Question 4

Part (a) of this question should have given almost all candidates the opportunity to score highly. However, it was demonstrated that candidates do not know the definitions of the terms used when writing about relational databases. Candidates struggled to discuss why normalisation is important without mentioning normal forms (i.e. the how to normalise). Many candidates expressed the idea that data independence means that data is either independent of other data (including primary keys) or even of the data structure itself! Another misconception seems to be that data consistency is to do with how the data is formatted.

Part (b) elicited some worrying responses in so far as candidates wrote that validation ensures that data entry is correct. (This error might be avoided in the future if candidates are encouraged to relate the work that is carried out for coursework projects to the question papers.) Good responses explaining why validation is important referred to data being sensible or that it stopped erroneous data being accepted (as

opposed to normal or extreme data). Most candidates gained some credit for identifying how to validate, and examples of fields that could be validated.

Candidates were normally able to gain credit in part (c). However, weaker candidates missed marks by describing discussions after the system was produced, rather than restricting themselves to discussion at the design stage.

Question 5

Generally candidates could list items that would be included in a network log for part (a), although weaker candidates tended to repeat the same type of item (for example, several time related items or several resource-use related items.) At this level, it is expected that candidates should be able to give several different distinct examples.

Better candidates gave good responses to part (b) in which they discussed monitoring in order to improve services to users. A number of candidates simply identified the primary role of the log as a deterrent, rather than saying that knowledge that the log exists may itself be a deterrent, or saying that the log could be used as evidence of misuse. In order to gain the full range of marks candidates should be encouraged to consider the positive uses of such network monitoring tools, rather than the negative.

Question 6

Part (a) posed little problem for many candidates, and most could gain at least one mark for identifying a method of obtaining software. Weaker candidates failed to score if they identified types of software, rather than methods of obtaining software.

Part (b) caused more problems for candidates, as several concentrated on looking at criteria in order to decide which specific solution to choose, rather than comparing methods of obtaining software. Better candidates were able to compare time and cost related issues referring to the methods identified in (a).

Question 7

In part (a) of this question the issue of testing was being examined. This area of the specification seems to be well understood by the majority of candidates. Consequently, almost all candidates gained some credit here, with many scoring maximum marks.

Part (b) caused difficulty for some candidates, with a favourite problem being that the user was using a machine that, 'was not powerful enough.' Rarely was this qualified and so could not gain credit. Candidates who mentioned that the user may have been misinformed about the minimum specification hardware required to run the software were rewarded.

In part (c) candidates were often able to cite examples of when a maintenance release would be used, with the better candidates able to categorise this as adaptive, perfective and corrective maintenance. The examples of the introduction of the euro and the millennium bug continue to be given, but these should be avoided now as they have now become very dated indeed. Equally, candidates are using the term 'bugs' without giving a clear indication that they understand the term. It would be better to use the term 'logical errors'. Good answers were also evident where candidates gave answers within the context of an image manipulation package as given in the question. The last part of (c) normally gained one mark for identifying the method of obtaining a release. Better candidates were able to recognise that the user needs to find out that the release is available, for instance through software running an auto-update.

Question 8

The area of the specification relating to evaluation criteria for specific software solutions is becoming very familiar to candidates and so this question produced a good range of answers. Weaker candidates

were able to list evaluation criteria, whilst the better candidates were able to expand upon this to give an explanation of what the criterion is and/or why it is useful. It is not uncommon for a strong candidate to gain full marks for this question. However, candidates should be reminded that no credit is given to a simple mention of cost without relating it to some benefit or otherwise to the organisation.

Question 9

Responses to this question were on the whole pleasing, with few candidates losing focus by moving away from the context of the question. Again, many candidates showed some sort of essay planning, either in diagrammatic or list form, and their answers tended to have well structured, coherent arguments that flowed with little or no repetition. This led to many responses to this question gaining good Quality of Written Communication marks, with some essays being both succinct and accurate. Where candidates did not spend a little time planning, there is evidence of them wandering off the point and being repetitive, making their responses sometimes more difficult to follow. This had the effect of lowering the Quality of Written Communication mark.

In terms of content, better candidates were generally able to write about the positive effects of standardisation for both staff and the health authority, and they were able to either make several distinct points or fewer points that were well described. In either case, candidates were able to gain good marks. Almost all candidates were able to write about the resistance to the change, and the reasons that this might be. By far most of the marks gained were in this part of the essay.

From the responses given, it is evident that candidates assume that a standardised system must mean that the old system was not on a network, but the new one is. Weaker candidates missed marks by following this line of argument, i.e. discussing how a network would benefit the health authority, rather than the benefits of standardisation. There was also a general trend evident wherein candidates simply stated that that 'old people' will resist change more than anyone else; again this is a response that should be avoided, as it is not creditworthy.

Unit 6 The Use of Information Systems for Problem Solving

Whereas ICT 3 is about a task, ICT 6 demands consideration of a system. Candidates are attempting to show that they can build an ICT solution for a scenario where the data will and can change over time and/or the system itself is susceptible to change from entities outside of the system's boundary. The scenario needs to be genuinely realistic for a candidate at A2 and so allow them to interact with a genuine end-user of that system. Candidates should be reminded that they may not act as their own end user.

Candidates should be encouraged to exploit issues within the other A2 modules and so it would be relevant, for example, to see a candidate tackle the management information issues in a system without first having to implement all of the transaction processing elements.

Many centres seem to have considerable experience of this module and this is reflected in the high standards of work often seen from their candidates. Centres mainly implement in Microsoft Office using Access. However, a number of centres have begun to develop solutions which use browser based software to provide data capture and/or reporting facilities from an underlying relational database.

Although ICT 6 represents the full range of systems development tasks, the focus is on producing a reliable and robust ICT solution from the available software.

Issues still remain with the analysis section where a number of centres continue to over value the quality of the work submitted.

Analysis

The purpose of this section is to explain fully to a third party the precise operation of the current system and the constraints upon it, so that the design effort could be initiated by a third party. All too often candidates do not have an adequate understanding of the problem they are solving and this too often then leads on to a simplistic or inappropriate solution.

It is expected that candidates will make appropriate and sensible use of appropriate systems analysis tools and techniques. Some form of data analysis is essential and without doubt a data dictionary or equivalent is expected to summarise that analysis, particularly if a database design is to be considered later.

Please note that high marks were sometimes given by teachers for superficial attempts at the analysis. For example, the inclusion of a data flow diagram without other essential written descriptive work is unlikely to ensure that the information flows and data dynamics have been fully identified.

Without a full understanding of the problem and how the system currently operates the candidate will be limited in the solution they are able to develop and how well that solution solves the problem set. To achieve this a comprehensive document is expected with a high degree of detail.

Design

Candidates should be reminded that to achieve high marks for this section a competent third party should be able to implement from the design work presented, and that an effective and full testing plan must be present in this section of the documentation.

Good design work featured candidates considering the important issues of data capture, reporting and processing activities, perhaps through update or append queries in Microsoft Access. A common fault, often seen in ICT 3 as well, is to find a major feature clearly documented in the implementation but omitted from the design work.

In this Design phase of the ICT 6 project, as it is with ICT 3, a test strategy and plan(s) should be produced before the implementation. The candidate must have a clear idea of the desired result, the criteria for success, and the nature and scope of the data with which to test their solution. The focus for testing must be on whether the solution developed can achieve the main functions of the system and respond to the changes anticipated. At times candidates focussed on trivial aspects, often repeating themselves at the expense of the main testing issues. At this stage candidates should also address how the user will be involved in the testing phase. Of the work seen by Moderators, some candidates even produced comprehensive plans which indicated the data the user should use in their testing activity.

Implementation

High marks can be awarded here for a solution that is a full and effective solution for the problem posed. Given the nature of the problems as open ended and dynamic, we can expect to see here solutions which fully exploit the software. In particular, when database management software is used, we expect to see the full and effective use of the appropriate software functions which manipulate the data in the system, not just simple use of the storage and visual presentation aspects. For a database, solutions which add and output data to a number of individual tables without exploiting the relational nature of multiple tables are unlikely to be able to achieve the higher mark ranges.
Centres are asked to ensure that candidates have included adequate technical documentation within this section to support the judgements centres make about the mark to be awarded, and to make relevant notes on the Candidate Record Forms to support those judgements. All of this helps to ensure that candidates' work is fairly and accurately assessed.

Testing

More widespread use of data sets has been seen as centres appreciate that it is difficult to test queries if the data to be searched is not known. There was also a better appreciation that only samples of testing are required when repetitive situations are encountered.

As with ICT 3, is important that candidates test the functions that they have set up within the software and they should not dwell on trivial aspects or, indeed, retest features already built into the software!

The specification states that end-user involvement must be 'clearly evidenced and reflects full participation' to attain the highest mark range.   In this section of the marking criteria, high marks were yet again being inappropriately allocated for the provision of a simple letter from the end-user stating that he/she had seen the system. To get into the highest mark range, it is expected that end-user acceptance testing will be planned for, carried out and fully documented.

User Guide

The user guide remains a very good source of evidence of how the solution is expected to work. The focus of this guide should be the main tasks the solution delivers and an explanation of this in a form appropriate for the prospective end-user(s). We have continued to see user documentation of good quality from candidates who demonstrate well the normal use of the system but, as ICT 6 systems deal with problems where there is dynamic change to data, clearly the guides should deal with this, including issues such as archiving, where necessary.

Evaluation

While any information system will have general criteria that can be applied (e.g. how robust is the solution?) the candidate must make these criteria specific to the problem in hand. The candidate should be able to identify suitable performance indicators, both qualitative and quantitative, against which to assess their solutions' performance and refer to evidence within their project as part of their discussion. For example, if a candidate had set an objective relating to accuracy of processed data, then it is necessary to state what degree of accuracy is required. In discussion of whether this has been met, the candidate should offer reference to proof, which should be available within the testing section of the project. The end-user acceptance testing can be a rich source for supporting evidence for the candidate's evaluation work.

Report

The final report should be clearly delineated, be paginated and have a list of contents. These were evident in many reports. It is pleasing to see that presentation standards continue to improve.

Overall it should be possible for a third party to follow the progress of the solution through its stages clearly seeing the development of the project. Clear and appropriately sized illustrations should be used when appropriate. Candidates should be reminded of the need for accurate spelling, punctuation and grammar.

Candidates should also be reminded that the marks here are not solely for the neat appearance of the report, but the quality of the documentation in describing the development of the candidate's solution.

Mark Ranges and Award of Grades

Unit/Component	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
Unit 1- Information: Nature, Role and Context	60	60	33.6	8.7
Unit 2 - Information: Management and Manipulation	60	60	27.0	8.8
Unit 3 - The Use of Generic Application Software for Task Solution	60	60	31.4	11.1

For units which contain only one component, scaled marks are the same as raw marks.

Unit 1 - Information: Nature, Role and Context (16655 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	60	48	44	40	36	33
Uniform Boundary Mark	90	72	63	54	45	36

Unit 2 - Information: Management and Manipulation (21359 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	60	42	38	34	31	28
Uniform Boundary Mark	90	72	63	54	45	36

Unit 3 - The Use of Generic Application Software for Task Solution (19940 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	60	42	36	30	24	18
Uniform Boundary Mark	120	96	84	72	60	48

Advanced Subsidiary award

Provisional statistics for the award (17386 candidates)

	A	B	C	D	E
Cumulative %	4.9	16.0	33.0	56.0	78.1

Unit/Component	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
Unit 4- Information Systems within Organisations	90	90	41.8	13.0
Unit 5 - Information: Policy, Strategy and Systems	90	90	38.2	12.2
Unit 6 - The Use of Information Systems for Problem Solving	90	90	42.1	14.4

For units which contain only one component, scaled marks are the same as raw marks.

Unit 4 - Information Systems within Organisations (8248 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	90	60	54	49	44	39
Uniform Boundary Mark	90	72	63	54	45	36

Unit 5 - Information: Policy, Strategy and Systems (**10390 candidates**)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	90	57	51	46	41	36
Uniform Boundary Mark	90	72	63	54	45	36

Unit 6 - The Use of Information Systems for Problem Solving (**10892 candidates**)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	90	59	50	42	34	26
Uniform Boundary Mark	120	96	84	72	60	48

Advanced award

Provisional statistics for the award (11090 candidates)

	A	B	C	D	E
Cumulative %	7.0	22.8	47.3	74.3	93.2

Definitions

Boundary Mark: the minimum mark required by a candidate to qualify for a given grade.

Mean Mark: is the sum of all candidates' marks divided by the number of candidates. In order to compare mean marks for different components, the mean mark (scaled) should be expressed as a percentage of the maximum mark (scaled).

Standard Deviation: a measure of the spread of candidates' marks. In most components, approximately two-thirds of all candidates lie in a range of plus or minus one standard deviation from the mean, and approximately 95% of all candidates lie in a range of plus or minus two standard deviations from the mean. In order to compare the standard deviations for different components, the standard deviation (scaled) should be expressed as a percentage of the maximum mark (scaled).

Uniform Mark: a score on a standard scale which indicates a candidate's performance. The lowest uniform mark for grade A is always 80% of the maximum uniform mark for the unit, similarly grade B is

70%, grade C is 60%, grade D is 50% and grade E is 40%. A candidate's total scaled mark for each unit is converted to a uniform mark and the uniform marks for the units which count towards the AS or A-level qualification are added in order to determine the candidate's overall grade.