GCSE 2003
June Series

ASSESSMENT and QUALIFICATIONS ALLIANCE

Report on the Examination

Information and Communication Technology
Specification B

- Full Course
- Short Course

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Set and published by the Assessment and Qualifications Alliance.

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee, registered in England and Wales 3644723 and a registered Charity 1073334.
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General

Most candidates attempted most of the questions on the paper. There were some excellent papers showing a good breadth and depth of knowledge at this level. Those few candidates who omitted questions or parts of questions often demonstrated a good understanding of those they attempted. Most candidates attempted the multiple choice questions with significantly greater success than those questions requiring diagrams or more extended written answers. A very few candidates made too many or two few choices in the multiple choice questions, for example, candidates made three choices when only two were required, thus reducing the maximum number of marks that could be awarded for the question.

When answering the questions on the written papers, some candidates gave the answers 'quicker', 'cheaper', 'easier', 'neater', 'more powerful', 'makes fewer mistakes', 'it could crash', etc. without further qualification, and credit was not given for these simplistic answers. More successful candidates explained, what is 'quicker', why it is 'quicker', what are the consequences because 'it could breakdown', etc. in relation to the context of the question. In addition, one word answers were not usually awarded a mark when a short description or explanation was required. Similarly, no marks were given for repeating the question without elaboration, and vague, repetitive or inaccurate answers. Better answers related well to the context of the question, were detailed and accurate, used appropriate technical language, and had illustrative examples. It was not uncommon for candidates to be awarded marks because they had given a good example, where marks could not be given for a weak explanation or a vague description. Diagrams were often poorly labelled and not well drawn.

Most candidates were appropriately entered at this level but a few candidates were inappropriately entered, and these entries were often part of a larger entry of candidates from a centre. Inappropriately entered candidates often expressed themselves relatively well and were more likely to complete questions in full and gain full marks. Candidates have better opportunities to fully demonstrate their knowledge and understanding, and achieve higher grades, if they are entered for an appropriately demanding tier.

Comments on specific questions:

Question 1

Part (a) was answered correctly by most candidates. Incorrect answers sometimes confused rows and columns. Part (b) was answered correctly by many candidates, but some candidates did not know that cell D3 would contain a formula, and some did not know that the format of cell B2 would be currency. Most candidates answered part (c)(i) correctly using a concise and well expressed formula; however, in part (c)(ii), many candidates could not identify two formulae that could be used in cell D7. Most candidates used cell references to identify cells in part (d) and many of these were awarded full marks. In part (e), most candidates recognised the pie and bar charts. Very few candidates answered part (f) correctly. Many could identify an appropriate type of graph but few could provide an adequate explanation why this should be used.

Question 2

Many candidates showed a good depth of knowledge; however, only the strongest candidates at this level were awarded full marks for this question. Part (a) was correctly answered by many candidates. A common incorrect answer was 'age' in part (a)(ii). Age would be calculated from the date of birth, which might well be another field included in each record. Part (b)(i) was answered correctly by most candidates, but many could not indicate the appropriate validation check in (b)(ii) and (b)(iii). Most candidates answered parts (c)(i) and (c)(ii) correctly. Several candidates answered part (c)(iii) correctly but many apparently confused OR and AND. Most candidates answered part (c)(iv) correctly. Part (d) was answered well by only a very few candidates.

Few candidates could give two valid reasons why the coding system was suitable in part (d)(i), and many candidates showed little awareness of the layout of responses on an OMR form in part (d)(ii). Many candidates' could not give an adequate reason why it is better to use OMR to input information than to type it in using a keyboard.

Question 3

Most candidates correctly indicated a valid configuration in part (a)(i), and many correctly identified the component parts in (a)(ii), (a)(iii) and (a)(iv). In (a)(iii) some candidates named component parts that were not illustrated in the question. Most candidates answered part (b) correctly. The most popular incorrect answer was a CD-ROM drive. Many candidates answered part (c) correctly. Few candidates were awarded full marks in part (d). Popular incorrect choices were to substitute 'text book' or 'logo' in place of 'operating system'.

Question 4

The majority of candidates were awarded full marks in part (a). A common incorrect choice was 'Record the temperature using a different kind of temperature sensor'. In part (b) many candidates correctly identified 'wind direction' and 'rainfall' but the third choice was sometimes incorrect, with 'tilt', 'density' and 'touch' all chosen by some candidates. Part (c) was answered correctly by some candidates. A range of valid answers were given for (c)(i) but many candidates gave answers of the type 'it saves time', 'it costs less' or 'it's faster' without further qualification, and were not awarded marks. Similarly, many candidates noted in part (c)(ii) that 'the computer might break down' without mention of the possible consequences. Part (d) was answered correctly by many candidates, although many believed CCTV cameras show if cars are speeding. In part (e), many candidates provided good explanations why people might be concerned about the widespread use of CCTV cameras. Many candidates expressed unease about being watched all the time, but fewer were able to articulate their concerns sufficiently for three marks to be awarded.

Question 5

In part (a), most candidates were able to write down the label of the task that is a part of testing; some correctly indicated the task that is a part of writing documentation but fewer could indicate the task that is a part of systems design. Few candidates answered parts (b)(i) and (b)(ii) correctly and in full. In part (c)(i), many candidates were awarded only 2 marks. A common incorrect answer was 'The user documentation is left justified'. Most candidates stated one or two correct ways of making documentation available in part (c)(ii) but very few could state three different ways.

Question 6

Many candidates answered part (a) correctly. In part (b)(i), most candidates recognised that line 5 should be similar in form to line 4, although only some candidates used the syntax accurately. Most candidates answered parts (b)(ii) and (c) correctly. In part (d), only a few candidates understood the advantages and disadvantages because the engineer was employed by a specialist contractor. However, most candidates answered part (e) correctly and in full. Many candidates answered part (f) correctly, although some stated that 'the computer might break down' in (f)(ii) without indicating why this would be a disadvantage.

Question 7

Part (a) was answered correctly by most candidates, and many answered part (b) correctly, although most candidates gave more valid advantages than disadvantages. In part (c), most candidates could describe how a virus could be downloaded from the Internet. A popular answer was that a virus might be transmitted as a part of an email, and that this could be prevented using a virus scanner. Most candidates could describe a further security threat and the means of preventing this. Many candidates answered part (d) correctly although fewer answered in full. Incorrect answers often referred to a means of preventing unauthorised access to software or networks.

Question 8

In part (a) candidates gave a range of correct advantages and disadvantages; however, some candidates gave advantages of the type 'faster', 'quicker' and 'more efficient', or disadvantages such as 'the computer might break down', etc., without qualification, and were awarded no marks. A few candidates stated that cash could be withdrawn from an Internet bank at home, or stated that it was not possible to withdraw cash, perhaps showing that they had not read the question thoroughly. Many candidates gave realistic advantages and disadvantages of shopping on-line in part (b). In part (c)(ii), many candidates noted that junk email was a possible consequence if Internet banks and on-line shops collect personal information about their customers. However, few candidates noted that this could be an advantage to the customer if the advertising was tailored to their specific needs. A common disadvantage given in (c)(ii) was that 'people won't like it'. Where this was stated without qualification no marks were awarded. Few candidates were able to list any principles of data protection in part (d). Many candidates suggested techniques more appropriate for protecting their own personal data and often missed the point.

Written Paper – Tier H

General

Most candidates attempted most of the questions on the paper. There were some excellent papers showing a good breadth and depth of knowledge at this level. Those candidates who omitted questions or parts of questions often demonstrated a good understanding of those they attempted.

When answering the questions on the written papers, some candidates gave the answers 'quicker', 'cheaper', 'easier', 'neater', 'more powerful', 'makes fewer mistakes', 'it could crash', etc. without further qualification, and credit was not given for these simplistic answers. More successful candidates explained, what is 'quicker', why it is 'quicker', what are the consequences because 'it could breakdown', etc. in relation to the context of the question. In addition, one-word answers were not usually awarded a mark when a description or explanation was required. Similarly, no marks were given for repeating the question without elaboration, and vague, repetitive or inaccurate answers. Better answers related well to the context of the question, were detailed and accurate, used appropriate technical language, and had illustrative examples. It was not uncommon for candidates to be awarded marks because they had given a good example, where marks could not be given for a weak explanation or a vague description. Diagrams were often poorly labelled and not well drawn.

Most candidates were appropriately entered at this level but a few candidates were inappropriately entered, and these entries were often part of a large entry from one centre. Inappropriately entered candidates often expressed themselves poorly and were more likely to omit parts of questions. Such candidates often answered multiple choice questions with greater success and there were more of these on the foundation tier paper. Candidates have better opportunities to fully demonstrate their knowledge and understanding if they are entered for an appropriate tier. It is likely that inappropriately entered candidates will obtain lower grades as questions on the higher tier paper will be less accessible to them than questions on the lower tier paper, perhaps causing them to be awarded significantly fewer marks.

Comments on specific questions:

Question 1

Part (a) was answered correctly by most candidates. Few candidates wrote down a full and complete answer in part (b). Many candidates wrote down a correct formula in part (b)(i); however, some used the sum(range) syntax inappropriately. In part (b)(ii), some candidates used the sum(range) syntax appropriately but of these fewer wrote down a valid range. Many candidates added individual cell references. Part (c) was answered correctly by most candidates. Those few candidates who did not use cell references to identify the cells, were often unable to accurately identify the cell that must be edited in (c)(i), and the cells that would change automatically in (c)(ii). Part (d) was answered correctly by most candidates. In part (e), many candidates correctly identified a type of graph, but were unable to give a valid reason why this type of graph should be used.

Question 2

Most candidates answered part (a) correctly. In part (b), few candidates could describe in full an appropriate validation check. Only a very few candidates correctly identified a 'range check'. Some candidates accurately described features of a range check, such as the upper boundary, but were unable to provide a full description. Many candidates showed very little understanding of validation, often confusing it with verification. Most candidates answered part (c) correctly. In part (d), few candidates answered correctly. Some candidates wrote down a further compound search condition, apparently unaware that the Employee Number alone would be sufficient because of its uniqueness. Part (e) was answered well by the many candidates who showed awareness of the layout of responses on an OMR form. In part (f), many candidates could not clearly identify the differences between input using OMR and voice recognition. There were many poor answers of the type 'quicker' and 'easier' without qualification.

Question 3

Most candidates correctly indicated a valid configuration in part (a). Part (b) was generally answered well although some diagrams in (b)(ii) were not labelled or were otherwise not sufficiently clear to be awarded marks. In part (c), only a very few candidates could clearly describe three differences between RAM and a hard disk. In part (d)(i), many candidates described hardware that would be used rather than software. In parts (d)(ii) and (d)(iii), many candidates did not identify advantages or disadvantages to the pupil.

Question 4

In part (a), some candidates clearly described how the council could improve the accuracy of prediction. Most candidates noted that taking more frequent readings would help improve accuracy; however, few could provide more than one effective strategy. Part (b) was answered correctly by most candidates. Some candidates identified the temperature as a type of information that could be recorded; however, this answer reiterated the question and was not awarded a mark. In part (c), few candidates were awarded full marks although most candidates could identify one or two advantages or disadvantages. In part (d), many candidates provided good explanations why people might be concerned about the widespread use of CCTV cameras. Many candidates expressed unease about being watched all the time, but few were able to articulate these concerns sufficiently for full marks to be awarded.

Question 5

Most candidates answered part (a) correctly. Few candidates answered parts (b)i and (b)ii correctly and in full. In part (c)(i), most candidates gave one or two reasons why the documentation was not good; however, many candidates repeated themselves or did not clearly differentiate the reasons given. Most candidates answered part (c)(ii) correctly, although many answers were very concise. For example, some candidates stated 'Internet' rather than 'a web page on the Internet'.

Question 6

In part (a)(i), most candidates recognised that line 5 should be similar in form to line 4, although only some candidates used the syntax accurately. Most candidates answered part (a)(ii) correctly. In part (b), few candidates fully understood the advantages and disadvantages because the engineer was employed by a specialist contractor. Most candidates answered part (c) correctly and in full. Many candidates answered part (d) correctly, although rarely in full, with many answers of the type 'more efficient', 'expensive', 'might break down' with little qualification indicating why these might be advantages or disadvantages to the environment.

Question 7

Part (a) was answered correctly by most candidates, and many answered part (b) correctly, although most candidates gave more valid advantages than disadvantages. Most candidates answered part (c) correctly. Many candidates identified viruses and hackers as security threats, and the use of a virus scanner and a firewall as the corresponding means of prevention. Many candidates answered part (d) correctly although fewer answered in full. Incorrect answers often referred to a means of preventing unauthorised access to software or networks.

Question 8

Part (a) was answered well by most candidates although fewer were awarded full marks. A few candidates gave advantages of the type 'faster', 'quicker' and 'more efficient', or disadvantages such as 'the computer might break down', etc., without qualification, and were awarded no marks. In part (b), many candidates noted that junk email was a possible consequence if Internet banks and on-line shops collect personal information about their customers. However, fewer candidates noted that this could be an advantage to the customer if the advertising was tailored to their specific needs. Some candidates could clearly describe three principles of data protection in part (c) but most did not express these clearly.

Coursework

General

Most centres marked candidates' coursework accurately using the new marking criteria. Coursework was generally well presented. However, too many candidates produced too much repetitive printout. Candidates and centres should note that quantity is not always indicative of quality.

Tasks addressing the theme of *Communicating and Handling Information* were on the whole appropriate, although there were a number of candidates who produced simple newsletters or brochures which did not reflect the marking criteria. There were a number of coursework tasks based on producing a web site, but in some cases these were no more than newsletters or brochures, and failed to make use of the range of interactive features available.

The theme of *Controlling, Measuring and Modelling* was mainly covered by coursework tasks based on spreadsheets. Modelling using a spreadsheet, requires the use of functions and formulae that can alter output when variables are changed. However, many of the spreadsheet-based tasks were no more than data handling tasks. In the future, full course candidates will be penalised if they fail to produce a modelling task. Many more centres now have Computer Control equipment, and more coursework tasks were control tasks. However, too many of these were no more than a group exercise repeated in detail. There was often too little original work done by individual candidates.

Candidates who were awarded high marks:

- attempted tasks that addressed all the assessment criteria
- presented their work using the marking criteria as sub-headings and in the same order as the marking criteria
- showed evidence to justify the marks awarded

Most centres assessed candidates in ways consistent with the marking criteria. In general, the more effective centres:

- set tasks within the capabilities of candidates
- ensured candidates' coursework was relevant to the task
- set tasks that enabled candidates to demonstrate the full range of their skills, knowledge and understanding
- ensured candidates designed ICT systems for others to use
- annotated candidates' coursework to show why marks were awarded
- demonstrated that there had been internal standardisation at the centre, where more than one teacher marked the coursework.

Appropriateness of tasks

Many centres allowed candidates a free choice of coursework topic approved by the teacher. This allowed candidates to demonstrate their ICT skills, knowledge and understanding in contexts of interest to them. As a result, candidates often showed pride in and ownership of their work. This approach encouraged candidates to document their work more thoroughly, and, consequently, they were often awarded higher marks.

However, in some centres, candidates attempted coursework tasks that were very similar. These were often too prescriptive, providing little opportunity for differentiation, and little variation in the marks awarded. The resulting work from these candidates was sometimes very stereotyped. Some approaches that **did not** allow candidates to address all the marking criteria included:

- tasks that were too prescriptive, giving candidates little chance to make informed decisions
- modelling tasks based on spreadsheets that had no facility to change the input variables in order to vary the outcomes and that were essentially an additional data handling task
- tasks that were designed to solve the problem for the candidate, rather than providing a context for the construction of a system that could then be documented for others to use
- tasks that required the candidate to comment upon existing systems rather than developing their own
- tasks that produced output because the software was able to produce that output but with no obvious relevance to the task

Guidance

Candidates should be given guidance in choosing tasks within their capabilities, and in producing clear and concise reports. Too many candidates produced a large volume of paper with little or no structure. This was difficult to mark and hard to moderate.

Information for the Moderator

There was wide divergence in the quality of background information provided by centres. The most helpful centres provided moderators with:

- details of the tasks given to candidates, including copies of any task sheets and supporting materials
- task cover sheets indicating which theme the task addressed
- annotation of the candidates work using the reference for each criteria indicated on the CAS
- an explanation of the rationale for the award of marks

Moderation was difficult where there was a lack of annotation. *Centres are strongly encouraged to annotate their work since it:*

- is a requirement of the *GCSE Mandatory Code of Practice*
- provides guidance to candidates
- provides justification for the award of marks
- is essential for internal moderation
- shows how the candidate explored various approaches before making their final decision
- assists the external moderation process

Awarding of Marks

Marks can only be awarded where there is evidence to support the award. In many instances too little evidence was provided. A few centres awarded full marks for relatively trivial explanations.

Description of the task to be attempted

Too many candidates described their solution rather than the problem. For example, 'I am going to design a database (or spreadsheet) to….'. Candidates should be encouraged to adopt a **systems analysis** approach to their work and design a system that could be used by a third party and meets a defined and identifiable need. Following this approach, the task should address all the assessment criteria. Candidates who did not follow this approach tended to be awarded lower marks for many of the criteria. Some candidates described existing systems rather than developing their own. Whilst these candidates generally displayed a good knowledge and understanding, the task did not meet the marking criteria and subsequently scored low marks.

Analysis and Specification

This area of candidates' work was generally well done. However, some candidates produced a description of the problem but did not develop this into a specification for the solution. Many had not thought through the system in depth, and had difficulty in formulating success criteria that might be applied to their solution. Instead they gave only vague aims rather than measurable objectives. Vagueness in the analysis section also hindered candidates when they produced their evaluation.

Some candidates included multitude copies of questionnaires that they had sent out, or many pages from magazines they had investigated. Their work might have been improved if they had included one or two examples and a summary of their findings, so that they could concentrate on further development of their specification.

Candidates who scored well looked at a variety of possible solutions to their tasks, and then selected the most appropriate method, giving reasons for their rejection of some methods and acceptance of others.

Some candidates produced good specifications that were not then referred to within the evaluation section.

Design of solution

Candidates who provided a structured and logical explanation of their design of the solution to the problem **in a variety of ways** tended to score well. For example, using a detailed and annotated flowchart, a description of the approach taken, and a systems diagram or algorithm.

Several candidates produced a flowchart with no explanation. In some cases, the flowchart provided little information about how the problem was to be solved and was not relevant to the task. Several candidates produced generic flowcharts copied from text books or provided by teachers which had not been adapted to illustrate the solution to the specific task being undertaken. These gained little credit. Candidates could improve their work by explaining their choices and justifying the methods chosen.

Few candidates provided evidence that they had considered how data would flow through their system when it was working.

Implementation

Justification to support the decisions made by candidates in the implementation of their solutions, is a strong theme running through these sections of the assessment scheme. Training materials are available from the board indicating expectations for the extent of justification required.

Resources for hardware and software

Candidates are asked to describe and justify the hardware and software resources needed to run the proposed system. Whilst some centres prepared their candidates well for these sections, many candidates failed to give a satisfactory justification for their choice of resources. Too often, a list of software and hardware was provided without justification.

Some candidates made comments such as 'I will use a particular software package because it is the only package I have access to' or '…because it does everything I need'. Candidates should explain the requirements of the ICT system and how the chosen software and hardware will meet them.

Some candidates provided what appeared to be a reference sheet produced by the centre without indicating that this was not their own work. These candidates were awarded no marks.

Too many candidates listed the software and hardware resources used to produce their work instead of those required to solve the task. This section might be improved if candidates identified requirements in the analysis/design and matched their choice of resources to these requirements.

Data capture & input

There were some excellent examples of data capture forms and data entry screens, but a few candidates confused questionnaires prepared as part of the investigation with the data capture forms required in E((iii)). The data collection referred to in E((iii)) is part of the implementation of the solution rather than the investigation.

A significant number of candidates did not provide any explanation as to how methods of data capture had been designed with regard to clarity, ease of filling in, or methods of transfer to database. In these circumstances, it is not easy to determine if candidates have designed forms themselves or used a template or a wizard. In some cases, justification had been assumed because the format of the data capture form matched the database. It would have been preferable if the candidate had made this link explicit. In contrast, some centres did not give sufficient credit in this section to candidates who had designed suitable data entry screens.

Only a few candidates appeared to give much thought to data entry when designing spreadsheets. Data entry to a spreadsheet could be improved by using features such as comments, or by highlighting the cells which required data input.

Data validation & verification

Generally, when this section was covered, it was done well; however, there were still a few candidates who felt that checking work by eye was sufficient and who ignored the automatic validation checks possible in the software being used. Even if the software being used does not have the facility for automatic validation, candidates could be encouraged to discuss what checks would be desirable.

Some candidates, appeared to confuse setting up the field lengths with using a length check as validation (not realising that the former would truncate the data rather than produce an error messag(e).

Output

This section was generally well done, particularly with databases where candidates designed reports, mail merges, labels etc. However, some centres awarded marks for printouts, where it was not obvious that candidates had attempted to design specific formats. This section could have been improved by candidates annotating their printouts to explain how the design of the output related to their solution.

With modelling tasks, where spreadsheets were used, too little thought was given to formatting the spreadsheet differently from its default settings. Graphical output was often produced without any indication as to why a particular type of graph had been produced, or any reasons why it was used rather than another type of graph. Often a plethora of graphs were printed as the software used was able to produce these, and many of these were inappropriate.

Testing

More candidates recognised the need to test their systems, but those who did not often appeared to believe that the printouts produced by their system were sufficient evidence that the system worked in every aspect. The simple production of output is not sufficient reason to award marks in this section, and centres should encourage candidates to produce a logical and comprehensive strategy for testing their solution. Valid and invalid data should be used, where the outcome is known, so that problems with the ICT system can be identified.

Candidates who tested their system by letting their friends run the system gained very little, if any, credit, and statements without evidence that the system had been seen working were awarded few marks.

Documentation

Many candidates scored well in this section, particularly where they produced a separate user guide in booklet form, as this section requires that there is separate and clearly identifiable documentation. It is important to realise that the system will be used by someone initially unfamiliar with it, and that instructions for the use of the system must be simple and comprehensive. Candidates who did not produce ICT systems for others to use often scored no marks in this section.

Evaluation

Candidates' work in this section has improved. However, failure to specify suitable performance criteria in the analysis, and lack of a comprehensive, planned testing strategy, still limits the ability of many candidates to produce good evaluations.

Communication within the report

This section was accurately marked by most centres although some were too harsh. Candidates were rewarded for the clarity of their presentations and the techniques that they employed. Spelling, punctuation and grammar were, on the whole, of a higher standard, but it is surprising that many candidates did not appear to use spelling checkers and other tools to improve their work.

Administration

Most centres submitted their coursework punctually but some did not meet the set deadlines. This delays the moderation process and could lead to candidates not receiving their final grades on the published date.

Some centres did not include their Centre Declaration Sheet, to indicate that internal moderation had taken place.

The Candidate Record Forms (CRFs) were usually completed with accuracy, which greatly assists the moderation process. However, there were some arithmetic and transcription errors, and some centres did not use the current CRF.

Most centres provided the correct coursework sample as indicated in the AQA regulations; however, sampling procedures were problematic for some centres, and many of these had to be contacted several times to ensure that the moderator had the correct sample. The moderation process was simplified by those centres that provided the moderator with a list of candidates in rank order indicating those whose work had been submitted.

The use of plastic wallets is inadvisable, in that candidates try to put too many pieces of paper into a wallet. This wastes moderators' time and patience as they have to remove and put back the pieces of paper into the plastic wallets. Moderators would appreciate it if centres would limit the use of plastic wallets.

It is important to ensure that candidates' work is securely bound. Paperclips, however large, are not sufficiently secure, and when the coursework is taken out of the postage sacks it often falls apart. On such occasions, it would be helpful if pages were numbered sequentially, so that they could be put back in the correct order. The use of Treasury tags to secure work is encouraged.

It would also assist the moderation process if the two tasks submitted by candidates were clearly marked as task 1 and task 2, and that these numbers corresponded with the CRFs. It should be clearly indicated on each task which theme is being addressed.

Information and Communication Technology (Short Course)

Written Paper – Tier F

General

Most candidates attempted most of the questions on the paper. There were some excellent papers showing a good breadth and depth of knowledge at this level. Those candidates who omitted questions or parts of questions often demonstrated a good understanding of those they attempted. Many candidates attempted the multiple choice questions with significantly greater success than those questions requiring diagrams or more extended written answers. However, a few candidates made too many or two few choices in the multiple choice questions, for example, candidates made three choices when only two were required, thus reducing the maximum number of marks that could be awarded for the question.

When answering the questions on the written papers, some candidates gave the answers 'quicker', 'cheaper', 'easier', 'neater', 'more powerful', 'makes fewer mistakes', 'it could crash', etc. without further qualification, and credit was not given for these simplistic answers. More successful candidates explained, what is 'quicker', why it is 'quicker', what are the consequences because 'it could breakdown', etc. in relation to the context of the question. In addition, one word answers were not usually awarded a mark when a short description or explanation was required. Similarly, no marks were given for repeating the question without elaboration, and vague, repetitive or inaccurate answers. Better answers related well to the context of the question, were detailed and accurate, used appropriate technical language, and had illustrative examples. It was not uncommon for candidates to be awarded marks because they had given a good example, where marks could not be given for a weak explanation or a vague description. Diagrams were often poorly labelled, not well drawn and did not relate sufficiently to the context of the question.

Most candidates were appropriately entered at this level but a few candidates were inappropriately entered, and these entries were often part of a larger entry of candidates from a centre. Inappropriately entered candidates often expressed themselves relatively well and were more likely to complete questions in full and gain full marks. Candidates have better opportunities to fully demonstrate their knowledge and understanding, and achieve higher grades, if they are entered for an appropriately demanding tier.

Comments on specific questions:

Question 1

Part (a) was answered correctly by most candidates. Incorrect answers sometimes confused rows and columns. Part (b) was answered correctly by many candidates, but some candidates did not know that cell D3 would contain a formula, and some did not know that the format of cell B2 would be currency. The majority of candidates answered parts (c) and (d) correctly.

Question 2

Many candidates showed a good depth of knowledge; however, only the strongest candidates at this level were awarded full marks for this question. Part (a) was correctly answered by many candidates. A common incorrect answer was 'age' in part (a)(ii). Age would be calculated from the date of birth, which might well be another field included in each record. Part (b)(i) was answered correctly by most candidates, but many could not indicate the appropriate validation check in (b)(ii) and (b)(iii). Most candidates answered part (c) correctly.

Question 3

Most candidates correctly indicated a valid configuration in part (a)(i), and many correctly identified the component parts in (a)(ii), (a)(iii) and (a)(iv). In (a)(iii) some candidates named component parts that were not illustrated in the question. Only a few candidates answered part (b) correctly.

Question 4

The majority of candidates were awarded full marks in part (a). A common incorrect choice was 'Record the temperature using a different kind of temperature sensor'. In part (b) many candidates correctly identified 'wind direction' and 'rainfall' but the third choice was often incorrect, with 'tilt', 'density' and 'touch' all chosen by some candidates. Part (c) was answered correctly by some candidates. A range of valid answers were given for (c)(i) but many candidates gave answers of the type 'it saves time', 'it costs less' or 'it's faster' without further qualification, and were not awarded marks. Similarly, many candidates noted in part (c)(ii) that 'the computer might break down' without mention of the possible consequences.

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In part (a), most candidates were able to write down the label of the task that is a part of testing; some correctly indicated the task that is a part of writing documentation but fewer could indicate the task that is a part of systems design. In part (b)(i), many candidates were awarded only 2 marks. A common incorrect answer was 'The user documentation is left justified'. Most candidates answered part (b)(ii) correctly, giving a range of correct answers.

Question 6

In part (a), a few candidates understood the advantages and disadvantages because the engineer was employed by a specialist contractor. However, most candidates answered part (b) correctly and in full. Many candidates answered part (c) correctly, although some stated that 'the computer might break down' in (c)(ii) without indicating why this would be a disadvantage.

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Question 8

In part (a) candidates gave a range of correct advantages and disadvantages; however, some candidates gave advantages of the type 'faster', 'quicker' and 'more efficient', or disadvantages such as 'the computer might break down', etc., without qualification, and were awarded no marks. A few candidates stated that cash could be withdrawn from an Internet bank at home, or stated that it was not possible to withdraw cash, perhaps showing that they had not read the question thoroughly. In part (b)(ii), many candidates noted that junk email was a possible consequence if Internet banks and on-line shops collect personal information about their customers. However, few candidates noted that this could be an advantage to the customer if the advertising was tailored to their specific needs. A common disadvantage given in (b)(ii) was that 'people won't like it'. Where this was stated without qualification no marks were awarded.

Written Paper – Tier H

General

Most candidates attempted most of the questions on the paper. There were some excellent papers showing a good breadth and depth of knowledge at this level. Those candidates who omitted questions or parts of questions often demonstrated a good understanding of those they attempted.

When answering the questions on the written papers, some candidates gave the answers 'quicker', 'cheaper', 'easier', 'neater', 'more powerful', 'makes fewer mistakes', 'it could crash', etc. without further qualification, and credit was not given for these simplistic answers. More successful candidates explained, what is 'quicker', why it is 'quicker', what are the consequences because 'it could breakdown', etc. in relation to the context of the question. In addition, one word answers were not usually awarded a mark when a description or explanation was required. Similarly, no marks were given for repeating the question without elaboration, and vague, repetitive or inaccurate answers. Better answers related well to the context of the question, were detailed and accurate, used appropriate technical language, and had illustrative examples. It was not uncommon for candidates to be awarded marks because they had given a good example, where marks could not be given for a weak explanation or a vague description. Diagrams were often poorly labelled, not well drawn and did not relate sufficiently to the context of the question.

Most candidates were appropriately entered at this level but a few candidates were inappropriately entered, and these entries were often part of a large entry from one centre. Inappropriately entered candidates often expressed themselves poorly and were more likely to omit questions. Such candidates often answered multiple choice questions and short answer questions with greater success. Candidates have better opportunities to fully demonstrate their knowledge and understanding if they are entered for an appropriate tier. It is likely that inappropriately entered candidates will obtain lower grades as questions on the higher tier paper will be less accessible to them than questions on the lower tier paper, perhaps causing them to be awarded significantly fewer marks. Centres are urged to enter for the Foundation tier those candidates who do not express themselves with clarity in written English.

Comments on specific questions:

Question 1

Part (a) was answered correctly by most candidates. Few candidates wrote down a full and complete answer in part (b). Some candidates attempted to use an appropriate sum(range) formula but of these fewer wrote down a valid range. Many candidates added individual cell references. Part (c) was answered correctly by most candidates. Those few candidates who did not use cell references to identify the cells, were often unable to accurately identify those cells that would change automatically. Part (d) was answered correctly by most candidates. In part (e), many candidates correctly identified a type of graph, but were unable to give a valid reason why this type of graph should be used.

Question 2

In part (a), few candidates could describe in full an appropriate validation check. Only a very few candidates correctly identified a 'range check'. Some candidates accurately described features of a range check, such as the upper boundary, but were unable to provide a full description. Many candidates showed very little understanding of validation, often confusing it with verification. Most candidates answered part (b) correctly. In part (c), few candidates answered correctly. Some candidates wrote down a further compound search condition, apparently unaware that the Employee Number alone would be sufficient because of its uniqueness. Part (d) was answered well by only a very few candidates. Many candidates showed little awareness of the layout of responses on an OMR form.

Question 3

Most candidates correctly indicated a valid configuration in part (a). Part (b) was generally answered well although some diagrams were not labelled or were otherwise not sufficiently clear to be awarded marks.
In part (c), only a very few candidates could clearly describe three differences between RAM and a hard disk.

Question 4

In part (a), some candidates clearly described how the council could improve the accuracy of prediction. Most candidates noted that taking more frequent readings would help improve accuracy; however, fewer could provide more than one effective strategy. Part (b) was answered correctly by most candidates. Some candidates identified the temperature as a type of information that could be recorded; however, this answer reiterated the question and was not awarded a mark. In part (c), few candidates were awarded full marks although most candidates could identify one or two advantages or disadvantages.

Question 5

Most candidates answered part (a) correctly. In part (b)(i), most candidates gave one or two reasons why the documentation was not good; however, many candidates repeated themselves or did not clearly differentiate the reasons given. Most candidates answered part (b)(ii) correctly, although many answers were very concise. For example, some candidates stated 'Internet' rather than 'a web page on the Internet'.

Question 6

In part (a), few candidates understood the advantages and disadvantages because the engineer was employed by a specialist contractor. Many candidates answered part (b) correctly though rarely in full, with many answers of the type 'more efficient', 'expensive', 'might break down' with little qualification indicating why these might be advantages or disadvantages to the environment.

Question 7

Most candidates answered part (a) correctly. Many candidates identified viruses and hackers as security threats, and the use of a virus scanner and a firewall as the corresponding means of prevention. Many candidates answered part (b) correctly although fewer answered in full. Incorrect answers often referred to a means of preventing unauthorised access to software or networks.

Question 8

Part (a) was answered well by most candidates although fewer were awarded full marks. A few candidates gave advantages of the type 'faster', 'quicker' and 'more efficient', or disadvantages such as 'the computer might break down', etc., without qualification, and were awarded no marks. In part (b), many candidates noted that junk email was a possible consequence if Internet banks and on-line shops collect personal information about their customers. However, fewer candidates noted that this could be an advantage to the customer if the advertising was tailored to their specific needs. Some candidates could clearly describe two principles of data protection in part (c) but most did not express these clearly.

Coursework

General

Most centres marked candidates' coursework accurately using the new marking criteria. Coursework was generally well presented. However, too many candidates produced too much repetitive printout. Candidates and centres should note that quantity is not always indicative of quality.

Tasks addressing the theme of *Communicating and Handling Information* were on the whole appropriate, although there were a number of candidates who produced simple newsletters or brochures which did not reflect the marking criteria. There were a number of coursework tasks based on producing a web site, but in some cases these were no more than newsletters or brochures, and failed to make use of the range of interactive features available.

The theme of *Controlling, Measuring and Modelling* was mainly covered by coursework tasks based on spreadsheets. Modelling using a spreadsheet, requires the use of functions and formulae that can alter output when variables are changed. However, many of the spreadsheet-based tasks were no more than data handling tasks. Many more centres now have Computer Control equipment, and more coursework tasks were control tasks. However, too many of these were no more than a group exercise repeated in detail. There was often too little original work done by individual candidates.

Candidates who were awarded high marks:

- attempted tasks that addressed all the assessment criteria
- presented their work using the marking criteria as sub-headings and in the same order as the marking criteria
- showed evidence to justify the marks awarded

Most centres assessed candidates in ways consistent with the marking criteria. In general, the more effective centres:

- set tasks within the capabilities of candidates
- ensured candidates' coursework was relevant to the task
- set tasks that enabled candidates to demonstrate the full range of their skills, knowledge and understanding
- ensured candidates designed ICT systems for others to use
- annotated candidates' coursework to show why marks were awarded
- demonstrated that there had been internal standardisation at the centre, where more than one teacher marked the coursework.

Appropriateness of tasks

Many centres allowed candidates a free choice of coursework topic approved by the teacher. This allowed candidates to demonstrate their ICT skills, knowledge and understanding in contexts of interest to them. As a result, candidates often showed pride in and ownership of their work. This approach encouraged candidates to document their work more thoroughly, and, consequently, they were often awarded higher marks.

However, in some centres, candidates attempted coursework tasks that were very similar. These were often too prescriptive, providing little opportunity for differentiation, and little variation in the marks awarded. The resulting work from these candidates was sometimes very stereotyped. Some approaches that **did not** allow candidates to address all the marking criteria included:

- tasks that were too prescriptive, giving candidates little chance to make informed decisions
- modelling tasks based on spreadsheets that had no facility to change the input variables in order to vary the outcomes and that were essentially an additional data handling task
- tasks that were designed to solve the problem for the candidate, rather than providing a context for the construction of a system that could then be documented for others to use
- tasks that required the candidate to comment upon existing systems rather than developing their own
- tasks that produced output because the software was able to produce that output but with no obvious relevance to the task

Guidance

Candidates should be given guidance in choosing tasks within their capabilities, and in producing clear and concise reports. Too many candidates produced a large volume of paper with little or no structure. This was difficult to mark and hard to moderate.

Information for the Moderator

There was wide divergence in the quality of background information provided by centres. The most helpful centres provided moderators with:

- details of the tasks given to candidates, including copies of any task sheets and supporting materials
- task cover sheets indicating which theme the task addressed
- annotation of the candidates work using the reference for each criteria indicated on the CAS
- an explanation of the rationale for the award of marks

Moderation was difficult where there was a lack of annotation. *Centres are strongly encouraged to annotate their work since it:*

- is a requirement of the *GCSE Mandatory Code of Practice*
- provides guidance to candidates
- provides justification for the award of marks
- is essential for internal moderation
- shows how the candidate explored various approaches before making their final decision
- assists the external moderation process

Awarding of Marks

Marks can only be awarded where there is evidence to support the award. In many instances too little evidence was provided. A few centres awarded full marks for relatively trivial explanations.

Description of the task to be attempted

Too many candidates described their solution rather than the problem. For example, 'I am going to design a database (or spreadsheet) to….'. Candidates should be encouraged to adopt a **systems analysis** approach to their work and design a system that could be used by a third party and meets a defined and identifiable need. Following this approach, the task should address all the assessment criteria. Candidates who did not follow this approach tended to be awarded lower marks for many of the criteria. Some candidates described existing systems rather than developing their own. Whilst these candidates generally displayed a good knowledge and understanding, the task did not meet the marking criteria and subsequently scored low marks.

Analysis and Specification

This area of candidates' work was generally well done. However, some candidates produced a description of the problem but did not develop this into a specification for the solution. Many had not thought through the system in depth, and had difficulty in formulating success criteria that might be applied to their solution. Instead they gave only vague aims rather than measurable objectives. Vagueness in the analysis section also hindered candidates when they produced their evaluation.

Some candidates included multitude copies of questionnaires that they had sent out, or many pages from magazines they had investigated. Their work might have been improved if they had included one or two examples and a summary of their findings, so that they could concentrate on further development of their specification.

Candidates who scored well looked at a variety of possible solutions to their tasks, and then selected the most appropriate method, giving reasons for their rejection of some methods and acceptance of others.

Some candidates produced good specifications that were not then referred to within the evaluation section.

Design of solution

Candidates who provided a structured and logical explanation of their design of the solution to the problem **in a variety of ways** tended to score well. For example, using a detailed and annotated flowchart, a description of the approach taken, and a systems diagram or algorithm.

Several candidates produced a flowchart with no explanation. In some cases, the flowchart provided little information about how the problem was to be solved and was not relevant to the task. Several candidates produced generic flowcharts copied from text books or provided by teachers which had not been adapted to illustrate the solution to the specific task being undertaken. These gained little credit. Candidates could improve their work by explaining their choices and justifying the methods chosen.

Few candidates provided evidence that they had considered how data would flow through their system when it was working.

Implementation

Justification to support the decisions made by candidates in the implementation of their solutions, is a strong theme running through these sections of the assessment scheme. Training materials are available from the board indicating expectations for the extent of justification required.

Resources for hardware and software

Candidates are asked to describe and justify the hardware and software resources needed to run the proposed system. Whilst some centres prepared their candidates well for these sections, many candidates failed to give a satisfactory justification for their choice of resources. Too often, a list of software and hardware was provided without justification.

Some candidates made comments such as 'I will use a particular software package because it is the only package I have access to' or '…because it does everything I need'. Candidates should explain the requirements of the ICT system and how the chosen software and hardware will meet them.

Some candidates provided what appeared to be a reference sheet produced by the centre without indicating that this was not their own work. These candidates were awarded no marks.

Too many candidates listed the software and hardware resources used to produce their work instead of those required to solve the task. This section might be improved if candidates identified requirements in the analysis/design and matched their choice of resources to these requirements.

Data capture & input

There were some excellent examples of data capture forms and data entry screens, but a few candidates confused questionnaires prepared as part of the investigation with the data capture forms required in E((iii)). The data collection referred to in E((iii)) is part of the implementation of the solution rather than the investigation.

A significant number of candidates did not provide any explanation as to how methods of data capture had been designed with regard to clarity, ease of filling in, or methods of transfer to database. In these circumstances, it is not easy to determine if candidates have designed forms themselves or used a template or a wizard. In some cases, justification had been assumed because the format of the data capture form matched the database. It would have been preferable if the candidate had made this link explicit. In contrast, some centres did not give sufficient credit in this section to candidates who had designed suitable data entry screens.

Only a few candidates appeared to give much thought to data entry when designing spreadsheets. Data entry to a spreadsheet could be improved by using features such as comments, or by highlighting the cells which required data input.

Data validation & verification

Generally, when this section was covered, it was done well; however, there were still a few candidates who felt that checking work by eye was sufficient and who ignored the automatic validation checks possible in the software being used. Even if the software being used does not have the facility for automatic validation, candidates could be encouraged to discuss what checks would be desirable.

Some candidates, appeared to confuse setting up the field lengths with using a length check as validation (not realising that the former would truncate the data rather than produce an error messag(e).

Output

This section was generally well done, particularly with databases where candidates designed reports, mail merges, labels etc. However, some centres awarded marks for printouts, where it was not obvious that candidates had attempted to design specific formats. This section could have been improved by candidates annotating their printouts to explain how the design of the output related to their solution.

With modelling tasks, where spreadsheets were used, too little thought was given to formatting the spreadsheet differently from its default settings. Graphical output was often produced without any indication as to why a particular type of graph had been produced, or any reasons why it was used rather than another type of graph. Often a plethora of graphs were printed as the software used was able to produce these, and many of these were inappropriate.

Testing

More candidates recognised the need to test their systems, but those who did not often appeared to believe that the printouts produced by their system were sufficient evidence that the system worked in every aspect. The simple production of output is not sufficient reason to award marks in this section, and centres should encourage candidates to produce a logical and comprehensive strategy for testing their solution. Valid and invalid data should be used, where the outcome is known, so that problems with the ICT system can be identified.

Candidates who tested their system by letting their friends run the system gained very little, if any, credit, and statements without evidence that the system had been seen working were awarded few marks.

Documentation

Many candidates scored well in this section, particularly where they produced a separate user guide in booklet form, as this section requires that there is separate and clearly identifiable documentation. It is important to realise that the system will be used by someone initially unfamiliar with it, and that instructions for the use of the system must be simple and comprehensive. Candidates who did not produce ICT systems for others to use often scored no marks in this section.

Evaluation

Candidates' work in this section has improved. However, failure to specify suitable performance criteria in the analysis, and lack of a comprehensive, planned testing strategy, still limits the ability of many candidates to produce good evaluations.

Communication within the report

This section was accurately marked by most centres although some were too harsh. Candidates were rewarded for the clarity of their presentations and the techniques that they employed. Spelling, punctuation and grammar were, on the whole, of a higher standard, but it is surprising that many candidates did not appear to use spelling checkers and other tools to improve their work.

Administration

Most centres submitted their coursework punctually but some did not meet the set deadlines. This delays the moderation process and could lead to candidates not receiving their final grades on the published date.

Some centres did not include their Centre Declaration Sheet, to indicate that internal moderation had taken place.

The Candidate Record Forms (CRFs) were usually completed with accuracy, which greatly assists the moderation process. However, there were some arithmetic and transcription errors, and some centres did not use the current CRF.

Most centres provided the correct coursework sample as indicated in the AQA regulations; however, sampling procedures were problematic for some centres, and many of these had to be contacted several times to ensure that the moderator had the correct sample. **The moderation process was facilitated by those centres that provided the moderator with a list of candidates in rank order indicating those whose work had been submitted .**

The use of plastic wallets is inadvisable, in that candidates try to put too many pieces of paper into a wallet. This wastes moderators' time and patience as they have to remove and put back the pieces of paper into the plastic wallets. Moderators would appreciate it if centres would limit the use of plastic wallets.

It is important to ensure that candidates' work is securely bound. Paperclips, however large, are not sufficiently secure, and when the coursework is taken out of the postage sacks it often falls apart. On such occasions, it would be helpful if pages were numbered sequentially, so that they could be put back in the correct order. The use of Treasury tags to secure work is encouraged.

It would also help the moderation process if the two tasks submitted by candidates were clearly marked as task 1 and task 2, and that these numbers correspond with the CRFs.

Mark Ranges and Award of Grades

Full Course

Foundation tier

Component	Maximum Mark (Raw)	Maximum Mark (Scale(d)	Mean Mark (Scale(d)	Standard Deviation (Scale(d)
3522/F	120	120	72.6	13.7
3522/C	80	180	64.0	32.1
Foundation tier overall 3522/F	--	300	136.7	39.1

		Max. mark	C	D	E	F	G
3522/F boundary mark	raw	120	75	62	49	37	25
	scaled	120	75	62	49	37	25
3522/C boundary mark	raw	80	42	34	26	18	10
	scaled	180	95	77	59	41	23
Foundation tier scaled boundary mark		300	158	131	104	78	52

Higher tier

Component	Maximum Mark (Raw)	Maximum Mark (Scale(d)	Mean Mark (Scale(d)	Standard Deviation (Scale(d)
3522/H	120	120	74.3	13.7
3522/C	80	180	118.7	37.0
Higher tier overall 3522/H	--	300	193.1	45.5

		Max. mark	A*	A	B	C	D	allowed E
3522/H boundary mark	raw	120	94	79	64	50	35	27
	scaled	120	94	79	64	50	35	27
3522/C boundary mark	raw	80	72	62	52	42	34	30
	scaled	180	162	140	117	95	77	68
Higher tier scaled boundary mark		300	249	214	179	145	112	95

Provisional statistics for the award

Foundation tier (1992 candidates)

	C	D	E	F	G
Cumulative %	31.6	54.9	76.3	91.2	96.4

Higher tier (4280 candidates)

	A*	A	B	C	D	allowed E
Cumulative %	10.1	36.1	63.9	86.0	95.0	97.2

Overall (6272 candidates)

	A*	A	B	C	D	E	F	G
Cumulative %	6.9	24.6	43.6	68.7	82.2	90.5	95.3	97.0

Short Course

Foundation tier

Component	Maximum Mark (Raw)	Maximum Mark (Scale(d)	Mean Mark (Scale(d)	Standard Deviation (Scale(d)
3528/F	60	60	34.6	8.3
3528/C	40	90	27.7	17.2
Foundation tier overall 3528/F	--	150	62.4	21.9

		Max. mark	C	D	E	F	G
3528/F boundary mark	raw	60	41	35	30	25	20
	scaled	60	41	35	30	25	20
3528/C boundary mark	raw	40	21	17	13	9	5
	scaled	90	47	38	29	20	11
Foundation tier scaled boundary mark		150	83	70	57	45	33

Higher tier

Component	Maximum Mark (Raw)	Maximum Mark (Scale(d)	Mean Mark (Scale(d)	Standard Deviation (Scale(d)
3528/H	60	60	35.4	8.0
3528/C	40	90	56.3	18.9
Higher tier overall 3528/H	--	150	91.8	24.0

		Max. mark	A*	A	B	C	D	allowed E
3528/H boundary mark	raw	60	56	47	38	30	22	18
	scaled	60	56	47	38	30	22	18
3528/C boundary mark	raw	40	36	31	26	21	17	15
	scaled	90	81	70	59	47	38	34
Higher tier scaled boundary mark		150	131	113	95	77	60	51

Provisional statistics for the award

Foundation tier (3514 candidates)

	C	D	E	F	G
Cumulative %	18.3	35.2	55.1	71.7	85.8

Higher tier (3170 candidates)

	A*	A	B	C	D	allowed E
Cumulative %	2.8	19.0	45.3	71.8	88.4	92.6

Overall (6684 candidates)

	A*	A	B	C	D	E	F	G
Cumulative %	1.3	9.0	21.5	43.7	60.5	72.9	81.6	89.0

Definitions

Boundary Mark: the minimum (scale(d) mark required by a candidate to qualify for a given grade. Although component grade boundaries are provided, these are advisory. Candidates' final grades depend only on their total marks for the subject.

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 (scale(d) should be expressed as a percentage of the maximum mark (scale(d).

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 (scale(d) should be expressed as a percentage of the maximum mark (scale(d).