

GCE 2002  
*January Series*



Report on the Examination

# **Information and Communication Technology**

- 
- Advanced Subsidiary

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*Kathleen Tattersall, Director General*

# CONTENTS

## AS Units

	<i>Page No.</i>
ICT1	Information: Nature, Role and Context.....2
ICT2	Information: Management and Manipulation .....4
ICT3	The Use of Generic Application Software for Task Solution.....7

# Information and Communication Technology

## Unit ICT1 Information: Nature, Role and Context

### General Comments

Most candidates were able to attempt all of the questions and candidates also seemed to have read the rubric on the paper indicating a question on the last page. Some candidates, however, are relying too much on learning the answers to past questions and/or failing to read the questions carefully so that their answers are not relevant to the particular question and its context. Some candidates are failing to look beyond the basic terms used in the questions and so answer at a very superficial level inappropriate to the level of paper.

Candidates were able to attempt all questions but some do not have the depth of understanding of the subject to be able to gain good marks. There were a lot of very generalised answers that made little reference to ICT. Good candidates should be showing a depth of understanding and breadth of knowledge of the subject of ICT rather than a series of learnt facts. Candidates were often failing to give examples, even where these were explicitly asked for in the question.

Wherever possible, credit is given for answers consistent with the spirit of the specification within the constraints of maintaining consistency and standards.

Although marks are not awarded specifically for quality of language, candidates do disadvantage themselves by poor presentation, handwriting and English in their answers. Frequently even subject specific terms were mis-spelt, making it difficult for markers to interpret the meaning of the candidates' answers.

### *Question 1*

This question was addressing some of the fundamental terminology and concepts central to the subject of ICT. Answers varied in standard from one candidate to another. Definitions were not always well known or understood and examples were given that frequently had nothing to do with ICT. For example, knowing what to do when a traffic light changes colour is not a suitable ICT example to illustrate knowledge. Some candidates failed to give any examples at all and many misunderstood the fact that data is plural. As previously, credit was not given for simple labelling in examples for information; processing had to be shown, even if it was implicit when examiners gave the benefit to the candidate. Too many answers were of the, "If... then..." type for knowledge. It should be noted that the specification does not define information as data with context, but states, "Information has a context...".

### *Question 2*

There were some good answers to this question that showed clear understanding of personal skills that were applicable but equally, many candidates did not read the question and answered in the context of questions on previous papers or in the context of ICT teaching in a school.

### *Question 3*

This was another question which illustrated the problem of what happens when candidates do not read the question carefully. Many candidates wrote generally about the pros and cons of buying databases with nothing to relate this to the specific situation. Better answers described the problems and time involved in recording data from the customer and the advantages of simply being able to look up

addresses from the postcode. Quite a number of candidates referred to a database of people interested in gardening books – a clear indication of the answer to last years question being learnt.

#### ***Question 4***

Many candidates' knowledge of the illegal activities aided by the Internet was well informed compared to their knowledge of how the Internet supports them. There was an over reliance on hacking and viruses as examples in the answers to this, and other questions. Candidates' knowledge of illegal activities was patchy with a lot of misconceptions. Some candidates totally misunderstood the question and described ways in which the Internet could be used to catch criminals.

#### ***Question 5***

Some candidates gave well-informed answers to this question.

In part (a) some candidates failed to show an understanding of the terms "internal" and "external" and instead referred to problems within and outside the actual processor. Credit was not given twice for the same example so as to ensure that candidates were not simply reeling off hacking/viruses yet again as being the only threats to Information Systems.

Part (b) was less well answered. Candidates could give measures but failed to explain how they actually protected the Information System. Candidates should have noted that there were two marks available for each of parts (i) and (ii). It should be noted that, unless candidates specifically discussed audit/logs of actions as a deterrent, they did not gain credit. This is because protection should occur before the event; not afterwards. Similarly, back ups were only accepted where they were justified as being off site as protection against damage to the site by natural disasters. There was confusion shown between the terms "encryption" and "encoding".

#### ***Question 6***

A similar question had appeared on a past paper and candidates had obviously benefited from seeing this. It was noticeable that there was a difference in the marks that a candidate achieved where they actually understood what was happening when they used a particular function of email. Some candidates described the function of the forward button in Internet browser software. "Send" and "receive" were frequently used to describe reading and writing emails. There was also the problem of candidates simply repeating the question in their answers. There was the feeling amongst examiners that candidates lost marks on this question because they did not think about what they were doing and describing exactly what the features meant; instead candidates rushed through the paper and put down very basic responses.

#### ***Question 7***

This was a straightforward question on Data Protection Legislation that was not well answered by candidates. Most candidates gained three or four marks but very few could answer parts (b) or (c) adequately. Again, the examiner asked for fundamental information that candidates should know and understand. Good, clear knowledge of the legislation was needed which would have enabled precise answers to be given. In part (d) (ii) one word answers were actually accepted as the question had been phrased in such a way as to allow them, but it was pleasing to see that the majority of candidates did use a sentence in answer. This is to be positively encouraged as the acceptance of one-word answers is rare at this level.

### ***Question 8***

This question showed the danger of learning answers to past similar questions with some candidates describing features of workstations or rooms rather than actually answering the question as set. Many candidates did not adequately understand the term “procedures” and a worrying number had little idea of what hardware is. As a result, few candidates gained good marks on parts (a) and (b) of the question. Answers to part (c) were often too generalised to gain marks; candidates failed to describe actual software features but used general terms like “user friendly” or “easy to use software”.

### ***Question 9***

This was apparently a popular question which elicited some good answers. The main problem was that candidates could state the advantages/disadvantages etc but were unable to elucidate further and describe or explain in context. Some candidates did not put their answers in context and referred to being able to run the store from home with no overheads and no travelling to work! It should be noted that the question referred to “a large clothing retailer”. Again, candidates who discussed the issues with reference to a bookshop showed the problem of relying on a previous question paper! Part (d) answers showed that candidates are increasingly aware of techniques used for advertising on the Internet, although some did suggest the construction of a new web site simply for advertising and others wrote generally about advertising methods that were not related to the Internet e.g. radio and television. Good answers included reference to examples such as advertising banners on other sites, registering with search engines and using links from associated sites.

## **Unit ICT2 Information: Management and Manipulation**

### **General Comments**

Nearly all candidates answered every question on this paper and most responses were of a satisfactory standard. There were very few scripts with questions not attempted. Better candidates answered using full sentences and it was pleasing to note there was a marked decline in the single word answers that are not appropriate at this level.

As in both the January and June 2001 series of examinations, many candidates were able to quote facts from the subject area relevant to the question, but frequently more care was needed to select the facts appropriate to the question posed. Also, weaker candidates seemed to have learnt answers from previous ICT2 papers and just quoted those, rather than addressing the questions posed in this examination. Candidates lost marks by not providing examples when the question provided clear instructions to include one or more example e.g. question 7 (a), “Explain, using examples, **two** advantages to the user of the natural language interface.”

Candidates need to demonstrate a clear understanding and appropriate use of the technical terms used in Information: Management and Manipulation. It is not sufficient just to quote the term as part of an answer e.g. extreme data, data consistency etc. A better answer would place the term in context e.g. extreme data is used to test that the validation boundaries have been correctly set.

### ***Question 1***

The majority of candidates were able to identify two or three different ways of formatting cells. A common mistake made by candidates was to quote several examples of the same type of formatting e.g. cell height and cell width are both examples of resizing a cell.

***Question 2***

Most candidates could identify at least one other method of preventing access to data. However, a small, but worrying, number of candidates had not realised that alternative methods had been asked for and insisted on describing the use of passwords quoted in the question. Voice pattern recognition was a common biometric measure identified, but many candidates just cited voice recognition only; better candidates explained that the pattern needed to be checked against stored voice patterns.

***Question 3***

Few candidates could fully explain why recovery procedures needed to be in place. Most candidates identified that up-to-date information must be available to the company but only better candidates identified that the company needed procedures to ensure that hardware, alternative accommodation for computer systems and fully briefed staff also need to be available for the business to continue. A common incorrect answer was to explain that recovery procedures were an alternative to be used when the backup procedures had failed.

***Question 4***

Many candidates did not understand the terms “interactive processing” and “transaction processing” and failed to explain how a transaction is processed within the system. The question clearly stated that the processing for the telephone ordering system had both these characteristics, but many candidates insisted on describing two different systems. Better candidates identified that the interactive part referred to the dialogue between user and system. Very few candidates showed a real understanding of transaction processing within a computer system. Many described the trading scenario (e.g. airline booking or use of ATMs) rather than considering the type of processing used by the system. A good response should identify that each item of data is dealt with as it is submitted and that each transaction is completed before the next is begun. In the case of a telephone ordering system the quantity of an item ordered by a customer is removed from the stored value of number of items in stock before another customer can place an order.

***Question 5***

This was a standard question that has appeared on previous papers. Many candidates could identify three or four advantages. However, weaker candidates were not specific enough in their responses, using phrases like “easier to use” and “saves on storage space” which gained no marks.

***Question 6***

Most candidates could identify four problems with the records for part (a). In part (b), as with previous similar questions, many candidates could describe appropriate validation checks but not always provide a suitable name. Most candidates correctly identified and described a presence check to prevent the problem of the empty surname field but a worrying number of candidates incorrectly named it as a present check. Also some candidates described validation checks that did not apply to the problems in part (a) and could not gain credit for their responses.

***Question 7***

This was the question that was most badly answered on the whole paper. Some candidates did not attempt this question but of those who did, few candidates in response to part (a) showed that they understood the concept of a natural language interface. The idea of being able to phrase a request to an Internet search engine in a variety of ways was required to provide an informed response. Many candidates considered incorrectly the ability to enter questions in different languages, either omitted an example or gave examples that were not relevant to using an Internet search engine.

For the candidates who answered part (b), many could identify the problems of a natural language interface coping with mis-spelled words, poor grammar or slang. Better candidates also identified problems of coping with complex requests. Again, by not providing an example, many candidates restricted the marks available to them.

### ***Question 8***

Part (a) of the question was usually well answered with most candidates able to identify problems with poorly tested software and relate that to the customers' perception of the new software company.

In part (b) many candidates did not read the question carefully enough and responded with three types of test rather than three types of test data. However the candidates who realised that the question required types of test data, identified them correctly and gave appropriate examples, usually scored high marks. Candidates with an incorrect interpretation were still able to score some marks with their examples valid and invalid types of test data.

### ***Question 9***

Part (a) of this question was very well answered with most candidates clearly explaining the terms "Local" and "Wide Area Networks". Many candidates could have scored more than the five marks available. However, a few weaker candidates just paraphrased the terms and could not gain marks.

For part (b), the terms "server" and "peer-to-peer" were less well understood. There were several common incorrect responses. One was to draw diagrams of different network topologies and label one a server network and the other a peer-to-peer network. Another gave the difference as the number of computers the network would support, rather than looking at the functionality of the system. Better candidates identified the client/server relationship and explained about the role of the server in controlling access to resources, then contrasted this with the equality of status of computers on a peer-to-peer network.

### ***Question 10***

Part (a) was generally well answered with most candidates gaining full marks.

In parts (b) and (c) voice recognition software was well understood by the majority of candidates who were able to quote suitable advantages and disadvantages.

For part (d), most candidates clearly identified disadvantages of the voice output system but a few candidates confused input with output and incorrectly gave the disadvantages for voice output in part (c) and were left with nothing to add for part (d).

### ***Question 11***

Most candidates clearly understood and related their answer to the college scenario set by the question and made many valid points in their answers. Candidates who had taken the time to plan their answer avoided repeating very similar points throughout their response e.g., "printed prospectuses were available to prospective students who do not have access to a computer," was cited as an advantage for option 1 and not having access to a computer was also cited as a disadvantage for both options 2 and 3. This response could gain the mark once only. Candidates were asked for advantages and disadvantages to the college but only the very best responses emphasised the college view. Candidates were given credit for any valid advantage or disadvantage (see published mark scheme) but many responses could have been improved if they had been more clearly framed from the college's perspective.

## **Unit ICT3 The Use of Generic Application Software for Task Solution**

### **General Comments**

The majority of coursework seen in this session was either spreadsheet or database implementations. Generally the spreadsheet work was of a higher standard than the database work, with more software specific features being used than in the database work. The majority of the work reviewed was produced using Microsoft Office.

The problems attempted were generally suitable for the requirements of the specification and most solutions were appropriate. However, a number of centres misinterpreted the standard in terms of the mark scheme in the specification and awarded too many marks in relation to the quality of work. This often arose as a result of inadequate implementation and testing evidence being produced by candidates.

### ***Specification***

Although most candidates gave due consideration to user requirements and there were some good attempts at identifying input, processing and output needs, many were vague, referring to “keyboard input” and “screen output” and overall many candidates failed to consider the input, processing and output needs in sufficient detail.

Design work was very varied. Some good design work was seen but problems did exist where there was insufficient evidence to support a third party implementation. Often this was because candidates focussed solely on the visual elements of interface design. In spreadsheet work, no design for the macros that appeared later in the implementation was one example, or, in database projects the failure to consider how the data would be manipulated e.g. query design. For database projects few candidates showed clearly the origins for their database structures and many, as a result, could not correctly formulate the entities and attributes into a coherent, workable database structure.

Testing strategies were often vague with candidates writing theory only; they failed to apply this theory to their own work. Test plans were generally weak, often as a result of limited design work. Many candidates often only considered unit testing; few included integrated or end-user testing as part of their strategy or plan.

Candidates should be encouraged to test the major aspects of the work initially. For example, if the purpose of the project is to conduct a stock re-order then this function needs to be checked for the correct output and the data on which it should act should be clearly defined.

### ***Implementation***

While some very good implementations were seen, several centres submitted work that was of a low level. Candidates should avoid producing vast quantities of low-level work, such as menu driven systems that produce business cards, memos, minutes, or simple mail merge letters. Many of these solutions did not include advanced package specific skills.

Common problems with spreadsheet solutions included a heavy reliance on VBA coding, where packages were already available, with some simple calculations. For example, the candidates from one centre did not use the sum function but instead included each individual cell in the calculation. Candidates should always include a print out of formulae used from the spreadsheet software. It is not sufficient simply to write this down as this does not offer adequate proof.

Database solutions were sometimes not relational and those that did attempt to create relational databases often failed to enforce referential integrity. On occasions work was seen which was claimed to be relational but in fact was a series of tables with one-to-one relationships. Forms were often wizard produced with no additional customisation and main/sub-forms were often not used when it was appropriate so to do. Queries were generally simple and candidates often neglected this all-important part of any solution along with appropriate use of reports.

### ***Testing***

It is essential that test plans cover the whole system and include test data that check operation under extreme and boundary conditions. Candidates should ensure that outcomes of each test are fully documented and cross-referenced to the test plan. Few candidates produced evidence to demonstrate that corrective action had been taken to fix problems identified during testing.

It is the intention that testing should take place as the solution is developed. The problems that occurred and the steps the candidate took to solve these problems, along with re-testing, should also be shown.

Some candidates focussed solely on testing validation, input masks and navigation. It is critical that the fundamental purpose of the solution is fully tested and that hard copy evidence of this is included in the coursework submitted for assessment

### ***Evaluation***

Most evaluations were superficial and merely commented upon successes, whilst ignoring the limitations of the system produced. Candidates were often vague over the general success criteria for an ICT solution where, in fact, they needed to be aware of these and to relate them, where appropriate, to their own solution. Unfortunately there were still some candidates who produced personal evaluations at the expense of the product produced.

### ***User Documentation***

Most candidates produced good, high quality user documentation which demonstrated normal use of the solution produced. Some candidates provided on-line help, often to a high standard. However, few candidates identified problems that users might encounter or suggested methods of overcoming them.

## Mark Ranges and Award of Grades

Unit/Component	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
Information: Nature, Role and Context	70	70	30.8	8.4
Information: Management and Manipulation	73	73	26.1	7.7
The Use of Generic Application Software for Task Solution	60	60	25.7	9.8

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

### Unit ICT 1 Information: Nature, Role and Context (13076 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	70	45	39	33	27	22
Uniform Boundary Mark	90	72	63	54	45	36

### Unit ICT 2 Information: Management and Manipulation (5956 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	73	40	35	31	27	23
Uniform Boundary Mark	90	72	63	54	45	36

### Unit ICT 3 The Use of Generic Application Software for Task Solution (785 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 (1089 candidates)

	A	B	C	D	E
Cumulative %	4.0	17.3	41.8	67.9	89.6

## Definitions

**Boundary Mark:** the minimum (scaled) 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.