



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme January 2004

GCE

Information and Communication Technology

Unit ICT5

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Guidance on the award of the mark for Quality of Written Communication

Quality of Written Communication assessment requires candidates to:

- select and use a form and style of writing appropriate to purpose and complex subject matter;
- organise relevant information clearly and coherently, using specialist vocabulary when appropriate; and
- ensure text is legible, and spelling, grammar and punctuation are accurate, so that meaning is clear.

For a candidate to be awarded 1 mark for quality of written communication on the question identified as assessing QWC in a unit test, the minimum acceptable standard of performance should be:

- the longer parts (worth 4 marks or more) should be structured in a reasonably logical way, appropriate and relevant to the question asked;
- ideas and concepts should be explained sufficiently clearly to be readily understood. Continuous prose should be used and sentences should be generally be complete and constructed grammatically. However, minor errors of punctuation or style should not disqualify;
- appropriate AS/A level terminology should be used. Candidates should not use such phrases as ‘fighting disease’, ‘messages passing along nerves’, ‘enzymes being killed’ etc, but a single lapse would not necessarily disqualify. Technical terms should be spelled correctly, especially where confusion might occur, e.g. mitosis/meiosis, glycogen/glucagon.

The Quality of Written Communication mark is intended as a recognition of competence in written English. Award of the mark should be based on overall impression of performance on the question identified on the paper as assessing QWC. Perfection is not required, and typical slips resulting from exam pressure such as ‘of’ for ‘off’ should not be penalised. Good performance in one area may outweigh poorer performance in another. Care should be taken not to disqualify candidates whose lack of knowledge relating to certain parts of a question hampers their ability to write a clear and coherent answer; in such cases positive achievement on other questions might still be creditworthy. No allowance should be made in the award of this mark for candidates who appear to suffer from dyslexia or for whom English is a second language. Other procedures will be used by the Board for such candidates.

Examiners should record 1 or 0 at the end of the paper in the Quality of Written Communication lozenge. This mark should then be transferred to the designated box on the cover of the script.

GENERAL GUIDANCE NOTES FOR EXAMINERS

Overall guidelines

1. All examples accepted should be clearly related to the subject area and should not be “generalised” examples.
2. Attention should be paid to ensure that marks are not awarded for simple restating of the question or the stem, often involving the exact same terms.
3. The answers should be providing evidence of more than “man in the streets” knowledge of ICT.
4. It should be remembered that scripts could be seen after they are marked and so consistency of approach and correct mechanics of marking are essential.
5. Rules on positioning of ticks and marks are to aid in checking and remarking of scripts.
6. Do not expect the candidate to use the exact wording given in the mark scheme. If you are in doubt as to the correctness of an answer given by the candidate, consult your Team Leader.
7. From the examinations for 2003 onwards, where one-word answers are acceptable will be indicated on the question paper. (For 2002 the acceptance or otherwise will be determined at standardisation.)

Specific marking guidelines

8. The basic rule is one mark one tick. The tick to be positioned at the point where the mark is gained in the answer and definitely not in the margin.
9. The only figures in the margin should be sub-totals for parts of questions and a final ringed total for a whole question.
10. Where questions are divided into parts a, b and so on, and a mark is indicated for each on the paper, a mark should be positioned at the end of the appropriate response in the margin.
11. There should in effect be a mark in the margin at every point there is one on the question paper and a number of ringed totals, which relates directly to the number of questions on the paper.
12. Where a question has only one part, the total for that question should be written once and then again and circled. This allows for easy checking that totalling and transcription of marks is correct.
13. All zero values should be crossed through.
14. All blank spaces should be crossed through with a vertical line through the text space – not in the margin.
15. All writing must be marked as read, either by the presence of ticks or by striking through the script with a vertical line.
16. All blank pages must be crossed through.
17. Where candidates have added extra to their answers later in the script, the total mark should be indicated as including x from Page y. The total mark should be in the position where the answer starts.
18. The use of the following symbols/marks is acceptable:
 - a. BOD – where the benefit of the doubt is given for the point the candidate is making. This is generally where poor writing or English is an issue. Its widespread use should be avoided.

- b. Underlining of subject specific terminology, which is misused or incorrect e.g. encoding rather than encryption, information rather than data.
- c. Underlining can also be used to highlight clearly incorrect statements or the use of a generalised phrase such as quicker, user friendly and so on.
- d. An omission mark ^ should be used where the candidate has given insufficient information to gain a mark. This is particularly useful when a teacher or student looks at scripts against a mark scheme.
- e. It may be appropriate to indicate where the same point has been covered more than once by an arrow or where a point has been covered in several lines of prose by the use of brackets.
- f. The use of letters associated with ticks **may** be used to indicate different areas being marked in a question, particularly to indicate the different bullet points in an essay. **THIS WILL BE OUTLINED AT STANDARDISATION.**

19. **NO** other symbols or comments should be used.

20. Markers are responsible for checking

- a. The transposition of marks to the front sheet
- b. That all work has been marked on each script
- c. That all marks for individual questions are totalled correctly
- d. That the script total is transferred to the box at the top right of the script.
- e. That they **clearly** initial the script, under the total at the top right, so it is possible for the Principal Examiner to identify each markers work.

Unit 5 Information : Policy, Strategy and Systems

1 *Name **three** methods of providing help to users of ICT systems.*

The following answers are examples only:

- Online help/ help menu within application/ context-sensitive help/ screen tips (1)
- Written documentation/ manuals (1)
- Telephone support (1)
- Wizards/ Demonstrations/ tutorials (1)
- User groups (1)
- Training (1)

3 x 1 mark

(3 marks)

2 *Graphical User Interfaces make high use of system resources.*

*Name **two** such resources and, for each one, state why it is required.*

The following answers are examples only:

- Hard Disk Drive/ Backing Store (1); a GUI holds many lines of code which needs to be stored/ the images used in the interface will need to be stored (1)
- Memory/ Immediate Access Store (1); large amounts of code need to be held in memory for execution/ by its nature, the interface contains a large proportion of graphics which need to be held in memory (1)
- Certain input devices are required (1); the interface will probably rely on some kind of 'point and click' in order to function (1)
- CPU (1); the complexity of the interface will mean that some form of processing time will have to be dedicated it (1)
- graphics card (1); will allow the CPU to be dedicated to other tasks (1)
- NOT monitor

2 x (2,1,0)

(4 marks)

3

Many network systems maintain a log that is used to monitor use of the network's resources.

- (a) State **three** items of data that you would expect to be held in such a log.
 (b) Describe **one** possible task for which this log can be used.

- a) The following answers are examples only. Allow one mark per sensible suggestion for a log entry, up to a maximum of 3.

- a record of facilities used by each person including processor time(1),
- number of pages printed (1)
- amount of disk space used (1).
- details of systems failures/ crashes/error messages (1)
- details of files stored/ updated/deleted (1)
- details of e-mail usage/storage (1)
- IDs of logged-on users (1)
- network address/hardware id of logged on users/details of workstations (1)
- time & duration of log in/log out/ when logged in (1)
- details of applications used/count of users per application/ number of licenses used (1)
- details of network traffic (1)
- number of failed log on attempts for a user (1)
- number of attempts to access blocked websites (1)

3 x 1 mark

(3 marks)

- b) The following answers are examples only. Allow one mark for what the task is, and one mark for how the log can be used for this task.

- observe usage patterns of users (1) so that peak times can be anticipated and planned for (1)
- observe where there are issues of congestion (1) so that strategies for upgrading/ replacement can be formulated (1)
- monitor usage of scarce resources e.g. colour laser printers (1) so that users can be charged correctly (1)

1 x (2,1,0) marks

(2 marks)

4

Describe **three** reasons why newly purchased software may fail to operate successfully, even if the developer has followed an extensive testing programme.

- cannot be tested with every combination of hardware/ software available (1) so new software may cause established systems to fail or vice versa (1)
- software now tends to be complex (1) so every single part of a system will not have been tested with every other part (1)
- new software may not be able to use older file formats (1) causing the company to have to re-enter data (1)
- user uses the software in a way that has not been considered (1) causing the software to behave in an unusual way/ unexpected results (1)

3 x (2,1,0) marks

(6 marks)

5

A teacher wishes to read the GCE Advanced Mathematics syllabus on the AQA website. The website holds this syllabus in a format known as Portable Document Format (PDF).

(a) Give **three** reasons why PDF has been selected as the format in which to offer this file.

(b) When the teacher tries to print the PDF file, it is discovered that the correct printer driver is not installed.

Explain why a printer driver is necessary.

(c) In order to acquire the correct printer driver, the printer manufacturer's website is visited. When the link leading to the download area of the website is followed, the address becomes "http://192.168.0.233/downloads/drivers.htm".

(i) What does the "http" part of the address represent?

(ii) "192.168.0.233" is an Internet address.

Explain why Internet addresses are important for the correct functioning of the Internet.

a) The following answers are examples only. Allow one mark for any point that relates to why the exam board have chosen PDF.

- de facto standard for document sharing on the web (1)
- exam board cannot guarantee the system type that viewers will have (1)
- software to read the document is freely available (1)
- formatting is retained (1)
- e.g. logos/ forms/ fonts (1)
- content can be copied and pasted into other applications (1)
- content of this document format is easily accessible but harder to change (1)

3 x 1 mark

(3 marks)

b) Any 2 from:

- translates document into a form usable by the printer (1) e.g. deals with margins/ fonts/ paper sizes/ etc. (1)
- enables communication between printer and OS/ application package (1)

2 x 1 mark

(2 marks)

c)

i) the protocol being used (1)

1 mark

(1 mark)

ii)

- needs to be unique so that only one machine is identified (1)
- if more than one machine has the same address, data cannot be routed towards it (1)
- provides a consistent way to refer to a specific machine (1)

- formal standard for addressing (1)
- hierarchical addressing scheme (1)
- DO NOT accept answers about URLs – question specifically asks about IP addressing.

3 x 1 mark*(3 marks)***6**

A publishing company wishes to standardise its ICT systems. Managers from all departments of this company are consulted before any standardisation takes place.

*(a) Describe, using an example, **one** reason why this consultation is necessary.*

(b) As part of this standardisation strategy it is decided that:

- *no computer hardware will be used for more than a fixed number of years;*
- *all departments will have a standard set of applications software;*
- *the software must support a certain set of file formats.*

*Explain **two** reasons why the company has decided to adopt this strategy.*

a) The following answers are examples only. Allow one mark for what the reason is for the consultation, and one mark for a good qualification.

- in order to make sure that departmental requirements are met (1); managers will know what their own departmental needs are and can communicate these/ good example(1)
- so that they feel included in the decision (1); if they have ownership of this decision, they are more likely to support and implement it correctly (1)

1 x (2,1,0) marks*(2 marks)*

b) The following answers are examples only.

- control over spending (1); replacement cost of hardware can be anticipated (1)
- new technology can be implemented over a reasonable period (1) without having to change every piece of equipment (1)
- core functionality will be maintained (1) all departments will be sure that they can share documents and guarantee that they can be understood (1)
- training issues (1) e.g. training can be standardised across all departments for the relevant applications (1)

2 x (2,1,0) marks*(4 marks)*

7

When designing a relational database it is necessary to normalise the data.

(a) Describe the process of normalisation.

(b) Describe **three** facilities that are provided by a Relational Database Management System.

a)

- naming First Normal Form, Second Normal Form, Third Normal Form (1)
- (1NF) Removal of repeating fields/ attributes/ ensure that values are atomic (1)
- (2NF) Removal of partial key dependencies/ ensure that non-key fields are functionally dependent on the primary key (1)
- (3NF) Removal of non-key dependencies (1)
- process for making the structure of a relational database more efficient (1)
- by defining tables, fields, and relationships/ appropriate terminology (1)

4 x 1 mark*(4 marks)*

b)

- mechanism for constructing/ maintaining the database (1) + expansion (1)
- provides the interface between user and data (1) + expansion (1)
- provides querying facilities (1) + expansion (1)
- provides reports/ output formatting (1) + expansion (1)
- provides security (1) + expansion (1)
- provides method of data definition (1) + expansion (1)
- provides facilities to aid data definition (1) + expansion (1)
- Open Database Connectivity/ ODBC (1) allowing program-data independence(1)

3 x (2,1,0) marks*(6 marks)*

8

Software solutions to specialist problems can be supplied in several ways. For each of the following ways:

- *give **one** situation where it would be appropriate;*
 - *describe **one** advantage of this approach;*
 - *describe **one** limitation of this approach.*
- (a) Software created by the user.*
(b) Software created by an internal development team.
(c) Software created by an external development team

In each part of this question:

Code situation marks as **S**

Code advantage marks as **A**

Code limitation marks as **L**

a) appropriate situation(1)

Advantage

- solution will be exactly what the user wants (1) as solution is not being generated by a third party (1)
- user will know exactly how the system functions (1) so maintenance/ adaptation of the solution later on should be simple (1)
- relatively short time to implementation (1) as no external consultation required (1)

Limitation

- skills of user may not be up to the task (1) so the solution may not be elegant (1)
- solution may store data in an unusual format (1) so data cannot be shared with other applications (1)
- if the system is used by more people, support may suffer (1) e.g. the user does not have time to support others (1)
- lack of documentation (1) e.g. the user is unlikely to produce manuals/ on-line help (1)

1S+2A+2L marks

(5 marks)

b) appropriate situation(1)

Advantage

- security (1); the system may contain data that the company wish to keep secret (1)
- solution should be a perfect fit (1); development team employed should be working towards business goals (1)
- progress can be tightly monitored (1); one manager may have direct control over the whole project (1)
- specialism (1) experts can work on what they do best (1)
- cost benefit (1) as developers are already employed by the company (1)

Limitation

- understanding of the processes and computer systems required (1) which may require a very specific skill set, that may not be available (1)
- team may be working on other developments for the company (1) and so may be getting pressure from others who see their project as more important (1)

1S+2A+2L marks

(5 marks)

c) appropriate situation(1)

Advantage

- availability of large skills base (1) i.e. individual/ company specialising in this type of system can be hired (1)
- external team may have previous experience of a similar system (1) and so may provide a system in a shorter timeframe (1)
- no need to employ specialists full time (1)
- solution should be a perfect fit (1)

Limitation

- possibly a long lead time (1) external team needs to understand exactly what the problem is before offering a solution (1)
- little control over the external development team (1) everything needs to be detailed in the contract (1)
- cost benefit may be an issue (1); use of external developers is an expensive option (1)
- issue of testing (1) + expansion (1)

1S+2A+2L marks

(5 marks)

IF AN IDEA HAS BEEN CREDITED AS REASONABLE IN PART (b), DO NOT CREDIT THE SAME IDEA IN PART (c).

9

A small reprographics business based in City A currently keeps a record of client and job details in a relational database. The owner decides to open a separate site in City B that will serve new customers. The City A site will occasionally need to access the City B customer data.

- (a) *Describe **one** advantage of using a distributed database in this situation.*
- (b) *Describe **one** limitation of using a distributed database in this situation.*
- (c) *Describe **one** advantage of using a client/ server database in this situation.*
- (d) *Describe **one** limitation of using a client/ server database in this situation.*
- (e) *The two sites will be connected using a public communications network. The owner is concerned about the security and privacy of the data on the system.*

*Describe **two** methods that can be used to ensure such security and privacy.*

a)

- *processing is local (1); there is no need for a powerful central server/ there is no reliance on a single machine (1)*
- *data is stored locally (1); this is the data that is used the most, so response time will be quicker/ means less network traffic between sites (1)*
- *queries can be localised (1) so if a certain search is only performed on one site, the query is held there (1)*

1 x (2,1,0) marks

(2 marks)

- b)
- reliance on communication links (1); if there is a problem with the communication lines, data cannot be shared (1)
 - loss of central control/ increased management overhead (1); someone at each site is responsible for the management of data on that site (1)
 - increased security risk (1); more access points = more likelihood of unauthorised access (1)
 - increased complexity of database itself (1) structure at both sites needs to be aware of the other (1)
 - need for each site to perform their own backup (1) meaning that a complete database backup cannot be assured (1)
- 1 x (2,1,0) marks** (2 marks)
- c)
- centralised resource (1) management of the system happens in one place (1)
 - decreased network traffic (1) only queries and results are sent/ received, not entire tables (1)
 - consistent views of the database (1) everyone sees the same database (1)
 - increased security (1) access control/ backup occurs at the server (1)
 - less powerful client machine required (1) all the work is done at the server (1)
- 1 x (2,1,0)marks** (2 marks)
- d)
- requires an expensive resource (1) a powerful server is required (1)
 - reliance on one machine (1); if there is a problem with the server, no one can work (1)
- 1 x (2,1,0) marks** (2 marks)
- e)
- make use of a firewall/ proxy server/ 'tunnelling'/Virtual Private Networks (1) data is filtered so that data for the 'private' network does not reach the 'public' network (1)
 - use encryption technologies (1) so that anyone getting hold of the data is not able to make sense of it (1)
 - passwords/ logins (1) to deter casual access to the system (1)
- 2 x (2,1,0) marks** (4 marks)

10

An employment agency currently holds information about job seekers and job vacancies on an information system that is several years old. As a consultant, you have been asked to help this company look at alternative software solutions.

Discuss what you would do in order to produce a report for this company. Your discussion should include:

- *how you will establish your client's needs;*
- *the criteria you will use to evaluate possible solutions;*
- *how you will match software capabilities to your client's needs;*
- *the content of the evaluation report you will write for your client.*

The quality of written communication will be assessed in your answer.

The solution for this question is intended to provide a framework of key concepts rather than a definitive solution. The aim is to establish an agreed standard that can be applied consistently, by all examiners, taking account of the many alternative answers to this type of question.

Allocation of marks:

How client need is established (code as **H**) – 4 marks

The criteria used to evaluate possible solutions (code as **C**) – 6 marks

Matching software to client need (code as **M**) – 3 marks

Content of the report (code as **R**) – 4 marks

Quality of written communication (code as **Q**) – 4 marks

Maximum mark for content is 16/20.

How client need is established (H marks)

- Initial meeting with end-user (1) so that requirements are clear and understood by both parties (1)
- Observation of the current system (1) so that tasks that are carried out can be evaluated/ it can be seen where the current system works/ doesn't work (1)
- Look at documentation currently in use (1) to see exactly the type of data that is currently used (1)
- Interviews with users at different points in the system (1) to get their perspective on the current system (1)

max 4 marks

Criteria used to evaluate (C marks)

In the following, 1 mark given for the criterion AND the description, and 1 mark for relevance to the scenario. A simple list of evaluation criteria will get 1 mark for 2 or 3 criteria, and 2 marks for 4 or more criteria. A list of criteria with descriptions, but no idea of relevance will gain a maximum of 3 marks for 3 criteria.

- **Functionality:** what does the system do/ does the system meet the end-user requirements (1) for example if a list of 'chef' vacancies cannot be created, the software doesn't do everything the company may need (1)
- **Robustness:** how reliable is the system/ will the system cope with the demands placed upon it (1); the company will deal with thousands of clients and thousands of vacancies – can the system deal with this volume of data without crashing? (1)

- Performance: how well does the system carry out tasks required of it (1); clients will want to know about vacancies quickly – if the system takes a long time to produce a list meeting client needs, the vacancies may already be filled (1)
- Resource requirements/ Compatibility: what hardware/ software/ personnel does the system require (1); can this system run on the hardware/ operating system currently in use by the company/ does the company have the personnel required to use/ manage the system (1)
- Transferability: can legacy data be incorporated into the new system (1); current data must be accessible, as well as data captured after the new system is in place (1)
- Portability: can data be shared with other applications (1); the company may want to produce statistics using another application about how many people were placed in certain job types every month (1)
- User support: how is the system supported/ training provided/ help available (1); the company will want to know that if things go wrong they can get advice in good time (1)
- Usability/ human-machine interface: is method of accessing the system suitable for the end-user (1); if the system is not easy to use, the users are not likely to continue using it/ the company is likely to be less productive (1)
- Cost benefit: how soon can the company recoup costs (1) if the system costs too much the company would suffer (1)

max 6 marks

Match software capabilities to client need (M marks)

- Establish which software is available to complete the task(s) (1)
- Apply the criteria decided upon to these software choices (1)
- Apply weighting to the criteria in order to compare different solutions (1)

max 3 marks

Content of the report (R marks)

- Description of the methodology: the approach(es) used in the creation of the report (1); so that the client understands what has been done(1)
- Evaluation: the actual findings/ applying the criteria decided upon to the solutions under consideration/ discussion of advantages and disadvantages of different possible solutions (1)
- Recommendation: the solution that best fits the clients needs(1)
- Justification: how this decision was reached/ how the evaluation was interpreted to inform this decision (1)

max 4 marks

(20 marks)