GCE 2005
January Series

ASSESSMENT and QUALIFICATIONS ALLIANCE

Final Mark Scheme as at (29/01/05)

Information and Communication Technology *(ICT5) 5521/6521*

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available from:

Publications Department, Aldon House, 39, Heald Grove, Rusholme, Manchester, M14 4NA
Tel: 0161 953 1170

or

download from the AQA website: www.aqa.org.uk

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 number 1073334. Registered address AQA, Devas Street, Manchester. M15 6EX. Dr Michael Cresswell Director General.

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. The answers given in the mark scheme are exemplars. Credit must be given for other correct answers not given in the mark scheme. Please refer to Team Leaders where there is any doubt.

8. One-word answers, where acceptable, will be indicated on the question paper.

9. The meaning of ICT-specific words and phrases are as defined by *A Glossary of Computing Terms* (current edition) by the British Computer Society.

Specific marking guidelines

10. 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.

11. The only figures in the margin should be sub-totals for parts of questions and a final ringed total for a whole question.

12. 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.

13. 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.

14. 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.

15. All zero values should be crossed through.

16. All blank spaces should be crossed through with a vertical line through the text space – not in the margin.

17. All writing must be marked as read, either by the presence of ticks or by striking through the script with a vertical line.

18. All blank pages must be crossed through.

19. 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.

20. 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 sign ^ 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.

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

22. 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

Examiners: the answers given in this mark scheme are exemplars. Credit must be given for other correct answers not given in the mark scheme. Please refer to Team Leaders where there is any doubt.

1	*Name **three** ways of obtaining software to provide solutions to specialist applications.*	
	• User written • Developed in-house • Use of external consultants • Leasing • Purchase/'Off the shelf' • Download from developer/retailer website It is important that answers refer to **obtaining** the software. **Any 3 x 1 mark**	3 marks

2	*Describe **three** ways in which a company can make use of computer networked systems.*	
	Award one mark for a use (the WHAT), and one mark for the expansion (the WHY). The following are examples only. • Distributed databases (1) so that all areas of the company have access to the same data at the same time (1) • Centralised database (1) so that data can be added from across the company (1) • Intranet (1) so that communication can be delivered to the desktop/ workstation/ everybody gets the information at the same time (1) • E-mail (1) so that communication can be delivered to all staff within the company (1) • Tele/Video-conferencing (1) so that meetings can be arranged without the need for travel (1) • Collaborative software (1); ability to work on the same document/ project/so that workers in different areas of the company can work together (1) • Hot desking (1) ability to work in any part of the company/ still be able to access your own work areas (1) • Internet access (1) so that data sources external to the company can be accessed (1) • Share resources (1) e.g. a few printers between many workstations (1) • Network audit function (1) e.g. tracking printer usage (1) **3 x (2,1,0) marks**	6 marks

3	*Users may be aware of differences in the user interface between a stand-alone machine and one that is on a computer network.* *For each of the following issues, describe **one** possible effect of a network environment on the user interface:* a) *security of the system;* b) *control of software used;* c) *control of files used;* d) *access rights to resources.*	
	1 mark for a straightforward statement relating to the effect, 1 mark for a good expansion. The following are examples only. a) • need to login to the system (1) puts more dialogue in place before accessing the system proper (1) • password management (1) e.g. minimum password length message (1) **1 x(2,1,0) marks** b) • access to software restricted (1) • as only the licensed number of concurrent copies can run at any one time(1) • users are only allowed to use certain software at certain times/ e.g. only allow students access to games at non-lesson times (1) • other suitable expansion (1) **1 x (2,1,0) marks** c) • status message relating to the file appears(1) • users are aware of others accessing the files (1) • access to the file is read only (1) • other suitable expansion (1) **1 x (2,1,0) marks** d) • users can 'see' certain printers (1) • that users in different areas see different printers/different user logging on to the same machine see different printers (1) • users can only see network drives relevant to their needs (1) • administrators see most/all resources whilst users see a restricted set (1) Allow answers in (d) that relate to (a), (b) or (c), providing they are not duplicate of previous responses. **1 x (2,1,0) marks**	2 marks 2 marks 2 marks 2 marks

4	*The interface for a computer system to be used by the general public has to be chosen carefully. An example of such a system is an Automated Teller Machine (ATM) network.* *a) Name, and give a reason for, a suitable type of interface for an ATM.* *b) Describe **two** characteristics of this type of interface, which make it suitable for an ATM.* c) *Describe **two** characteristics of the input and output devices that form part of an ATM.*	
	If the answer for part (a) is different, but the answers for (b) and (c) reasonably fit the context (ATMs) then give credit. **ANSWERS NEED TO BE IN CONTEXT.** a) • Menu Driven Interface (1) as there are a restricted number of tasks that can be performed via an ATM (1) • Allow answers that relate ATM to Graphical User Interface(1) with reasonable explanation (1) **1 x (2,1,0) marks** b) 1 mark for the characteristic, 1 mark for expansion in context. Accept any reasonable answer. • restricted choice (1); easy to show what to do for inexperienced users nature of the device is to offer restricted services/ any reasonable expansion (1). • hierarchical nature (1); structure is logical e.g. withdrawal amounts are together/ any reasonable expansion (1) • ease of use (1); skill level of end user is not known (1) • speed of use (1); this is important to users (1) **2 x (2,1,0) marks** c) 1 mark for the I/O device implication, 1 mark for the expansion. Accept any reasonable answer. • robust input device(s) (1) ATMs are often installed open to the elements (1) • screen resolution can be low (1) only has to support text and basic graphics (1) OR screen resolution is high (1) as can also provide advertising/ richer experience using hi-res graphics (1) • restricted input devices (1) only need to enter digits and make menu choices (1) **2 x (2,1,0) marks**	2 mark 4 marks 4 marks

5	*(a) Explain why entity-relationship diagrams are used when designing a relational database.* *(b) Describe the process of normalisation.* *(c) Explain, using an example, why normalisation is used when designing a relational database.*	
	a) 1 mark each for up to 3 points. The following are examples: • provides a diagrammatic representation of the structure of the data(1) • shows the types of relationships within the database (1) • one to one, one to many, many to many relationships shown (1) • shows the logical structure of the database (1) **3 x 1 marks** b) • 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) • breaking the structure into simpler forms (1) **4 x 1 marks** c) The following answers are examples only. Credit any reasonable explanation of why normalisation is used for a maximum of 3 marks. Credit any reasonably example for 1 mark. • in order to reduce/eliminate redundancy (1) • in order to avoid data duplication (1) • in order to increase consistency (1) • to ensure that data in tables in independent (1) • relevant example illustrating one of the points given (1) **4 x 1 marks**	3 marks 4 marks 4 marks

6	*A large college requires a new Management Information System to be created, which will replace several separate departmental systems. This new system will be used to provide information to external agencies, as well as statistical information to college staff. A small software company has won the contract to supply this software, although it has no previous experience of working with educational establishments.* *a) The college and the software company feel that it is important to discuss the requirements of the system.* *Explain why this meeting is important for both parties.* *b) Evaluation criteria have been established by the two parties to compare the possible solutions that the software company could produce. These criteria include 'cost-benefit' and 'compatibility'.* *i) Explain why 'cost-benefit' is a useful criterion in this situation.* *ii) Explain why 'compatibility' is a useful criterion in this situation.* *iii) Name and describe **two** other criteria that would be useful in this situation, stating why each one is useful.* *c) A report is produced for the college that compares various possible solutions.* *Name **four** sections that are likely to form part of the report, stating the purpose of each section.*	
	a) 1 mark each for up to 3 points. The following are examples. • The college informs the supplier of their needs (1) • The supplier needs to demonstrate that they have a clear understanding of the college's needs (1) • <u>Both parties</u> need to establish clear criteria for software choice (1) **3 marks** b) i) The college needs to see a good return on investment that is measurable (1) e.g. through more efficiency or through added functionality that reduces costs (1) **2 marks** ii) The college will have systems in place (hardware and/or software) (1) and the new package will have to function effectively with these (1) **2 marks** iii) Give one mark for a relevant criterion and two for a reasonable description up to a maximum of 2 criteria and 2 descriptions. Description marks are dependant upon criterion marks. Description must reflect the context in order to gain the third mark. The following are examples. Refer to p29/30 of the specification for the list of acceptable criteria. Criterion — Reason Functionality — The software will have to provide all the functions of the old systems (1) so that the college can produce the relevant information for all parties (1). Robustness — The college will be dealing with vast quantities of data (1) and the software will have to deal without crashing(1). Performance — The college will require results to be produced in a reasonable time (1) so the software package must be more efficient than current methods (1). Support — The college will require access to support initially such as training (1), but also in future if things go wrong (1).	3 marks 2 marks 2 marks

	Transferability	Any existing data the college holds that is should be available to the new software package (1) without the need for re-entering data (1).	
	Appropriateness/ Suitability to end user **(NB NOT EASE OF USE)**	Can't guarantee ICT literacy level of end user (1) college wants old and new employees alike to use the package quickly (1)	
	Futureproofing/ Upgradability	The software will have to be of use for a significant length of time (1) so the college will not have to have further investment in the same area in the future (1)	
		2 x (1 + (2,1,0)) marks	6 marks
	c) Up to 2 marks for each area of the report. • methodology (1) how the report has been derived (1) • results (1) the actual comparison of software packages based on the agreed evaluation criteria (1) • recommendation/conclusion (1) the judgement reached based on the results (1) • justification (1) how the results have informed the recommendation (1)		8 marks
		4 x (2,1,0) marks	

7	*A software company has created a program to assist people in recording findings whilst researching their family history. Many users discover a problem with a particular part of this program.* *Describe **two** methods that the company can use to distribute a solution to this problem.*	
	1 mark for HOW to provide the fix, and 1 mark for a reason/ expansion. The following are examples. • Post software patches on their website (1) so that those affected can download and install the patch (1) • Send out CD-ROM/ floppy disks/e-mail containing the software patch(es) (1) to users that have registered for this support/ users that have informed the company of the problem (1) • Release a new version of the software (1) so that future users are not affected (1) • Product recall (1) so users get a 'fixed' version of the software (1) • Have fix available to anyone who wants it (1) e.g. keep supplies of CD-ROMs at certain locations (1) **2 x (2,1,0) marks**	4 marks

8	*An office worker is having problems connecting to the Internet. A technician fixes this problem, but finds that several websites cannot be viewed correctly, as the page content is not standard* *a) Define the term protocol in relation to networking.* *b) Explain why standards are important for communication over the Internet.* *c) Explain the need for standard data representation in relation to networking and the Internet.*	
	a) A set of rules (1) that defines how devices communicate over a network (1). **2 x 1 mark** b) 1 mark each for up to 3 points. The following are examples. • provides an addressing mechanism so devices can be uniquely identified (1) • ensures that all devices are set up in similar ways (1) • provides error detection and correction mechanisms (1) • provides for a reliable connection between devices (1) • allows for open systems/ no reliance on one manufacturer (1) • mentioning the use of appropriate protocols e.g. TCP/IP (1) **3 marks** c) 1 mark per point up to 2 points. The following are examples. • to allow different software to understand the data (1) • to allow different hardware platforms access to the data (1) • mentioning the use of appropriate protocols/file types e.g. HTTP, MP3, GIF (1) **2 marks**	2 marks 3 marks 2 marks

9	*A partnership of architects is experiencing problems with its computer systems, which are several years old. These systems run both generic and specialist software, and make use of a range of hardware, including specialist devices. You have been asked to write a report that includes:* • *the reasons why this organisation may wish to upgrade its hardware, and how it could be done;* • *the reasons why this organisation may wish to upgrade its software, and how it could be done;* • *an outline of a backup strategy for this partnership.* *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: Hardware upgrade issues (code as **H**) – 6 marks Software upgrade issues (code as **S**) – 6 marks Backup strategy (code as **B**) – 6 marks Quality of written communication (code as **Q**) – 4 marks Maximum mark for content is 16/20 The following are examples. Accept any reasonable answer where the 2nd mark in each case is either a strong expansion or a good example in context. The question asks for a report. Do not penalise the student if the answer is not presented as a report. *Hardware upgrade issues (**H marks**)* • to keep up with industrial trends (1) • economic issues(1) • improved technology (1) • reduce maintenance costs/time (1) • lack of support for equipment (1) • instigate a rolling programme (1) • have different approaches for specialist and general hardware (1) • one mark per expansion of any relevant point (1) **max 6 marks** *Software upgrade issues **(S marks)*** • Improve functionality (1) • Legal changes/ standards changes (1) • Cost benefit (1) • Compatibility with hardware (1) • Changeover method (1) • Method of obtaining the software (1) • One mark per expansion of any relevant point (1) **max 6 marks**	

	*Backup strategy (**B marks**)* Award up to 3 marks for a list of items to be considered, with the second mark for an expansion of the item • Media (1) plus why important/ appropriate media choice(1) • Frequency (1) plus reason for appropriate frequency (1) • Storage (1) plus description of appropriate storage choice (1) • Content (1) plus description of what constitutes appropriate content (1) • Responsibility (1) plus description of who would be appropriate (1) • Logging (1) plus description of why logging is required (1) • Recovery testing (1) plus description of why this is necessary (1) **max 6 marks** *Quality of Written Communication Marks (**Q marks**)* 4 marks The candidate has expressed complex ideas clearly and fluently. Sentences and paragraphs follow on from one another smoothly and logically. Arguments will be consistently relevant and well structured. There will be few, if any, errors of grammar, punctuation and spelling. 3 marks The candidate has expressed moderately complex ideas clearly and reasonably fluently through well-linked sentences and paragraphs. Arguments will be generally relevant and well structured. There may be occasional errors of grammar, punctuation and spelling. 2 marks The candidate has expressed straightforward ideas clearly, if not always fluently. Sentences and paragraphs may not always be well connected. Arguments may sometimes stray from the point or be weakly presented. There may be some errors of grammar, punctuation and spelling, but not such as to suggest a weakness in these areas. 1 mark The candidate has expressed simple ideas clearly, but may be imprecise and awkward in dealing with complex or subtle concepts. Arguments may be of doubtful relevance or obscurely presented. Errors in grammar, punctuation and spelling may be noticeable and intrusive, suggesting weaknesses in these areas. **With this type of criteria candidates are given a mark on the basis of a "best-fit" approach.**	20 marks