GCE 2004
June Series

ASSESSMENT and QUALIFICATIONS ALLIANCE

Mark Scheme

Information and Communication Technology 5
(Subject Code 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:

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or

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

Specific marking guidelines

9. 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.
10. The only figures in the margin should be sub-totals for parts of questions and a final ringed total for a whole question.
11. 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.
12. 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.
13. 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.
14. All zero values should be crossed through.
15. All blank spaces should be crossed through with a vertical line through the text space – not in the margin.
16. All writing must be marked as read, either by the presence of ticks or by striking through the script with a vertical line.
17. All blank pages must be crossed through.
18. 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.

19. 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 the use of brackets or an arrow 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.

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

21. Markers are responsible for checking

a. The transposition of marks to the front sheet

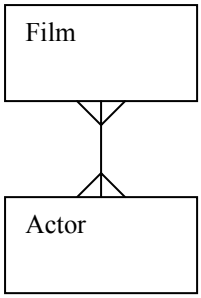
b. That all work has been marked on each script

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	*Figure 1 is an entity-relationship diagram.*  *Figure 1* *Name and describe the relationship between Film and Actor as shown in the above diagram.*	
	• A many-to-many relationship (1) • One actor appears in many films (1) • One film has many actors (1) **SPECIAL CASE**: many actors in many films <u>and</u> many films have many actors (1) **3 x 1 mark**	*(3 marks)*

2	*Explain why a Uniform Resource Locator is used to provide access to specific systems over the Internet.*	
	• Points to a specific website/ unique website identifier (1) • Maps to an IP address for a target device (1) • Is in human readable form/ is more understandable for humans (1) • Is more memorable/ more likely to be remembered (1) • Can be redirected to map to changing IP addresses (1) **3 x 1 mark**	*(3 marks)*

3	*The testing of software is an essential aspect in the overall provision of solutions.* *(a) Describe **two** reasons why a test plan is important.* *(b) Describe **one** reason why alpha testing is important.* *(c) Describe **one** reason why beta testing is important.*	
	(a) The following are examples only. • Provides a structured approach to the testing (1) • All required options are covered (1) • Documents the testing procedure (1) • Testing can be carried out by anyone (1) • Provides a reference (1) • When testing is carried out it can be referenced back to the plan (1) **Answers must relate to a test plan, not testing in general.** **4 x 1 mark**	*(4 marks)*
	(b) The following are examples only. • Testing carried out by developer (1) • Developer has some knowledge that their system works (1) • Tests all the parts of the system (1) • It is known that the individual parts work <u>as the developer expects</u> (1) • Ensures that the systems generally works before release outside the company (1) • Ensures that product meets requirements(1) **2 x 1 mark**	*(2 marks)*
	(c) The following are examples only. • Testing carried out by potential end users (1) • Who are likely to use the system in unpredicted ways (1) • Provides a more extensive method of testing (1) • A wider variety of issues with the system are likely to be highlighted (1) • Acts as a useful marketing tool (1) • By letting reviewers test the system, the is a source of relatively cheap advertising (1) **2 x 1 mark**	*(2 marks)*

4	*One method of providing a Human/ Computer Interface (HCI) is to make extensive use of menus. An example of where menus are used in this way is with mobile telephones.* (a) *Name **one** other situation where menus are used as the main feature of an HCI.* (b) *Describe **four** reasons why menus are appropriate in situations such as these.*	
	(a) appropriate situation (1) **1 mark** (b) • Speed (1) • Unknown user IT literacy (1) • Restricted choice (1) • Avoidance of errors (1) • Easy to learn/use (1) • Less hardware resource required (1) • Any other reasonable points (1 per point) • Plus one mark for expansion (1 per expansion) **The following are examples only.** • end users skills cannot be predicted (1) so a simple interface has to be provided that guides the user (1) • menus take up less resource on the device(1) so that these resources can be devoted to other things that add functionality/ device can be made more efficiently (1) • menus may be edited to allow for shortcuts (1) so that often used functions are easily available (1) • menus are structured in a logical fashion (1) so that users can make 'intelligent guesses' to find particular functions (1) **8 x 1 mark**	*(1 mark)* *(8 marks)*

<table>
<tr><td>5</td><td>A toy manufacturing company wishes to purchase a new system for maintaining stock data. When a consultant is appointed, the first step she takes is to set up a meeting with the relevant departmental managers of the company.
(a) Describe one reason for this meeting, in addition to establishing an agreed set of evaluation criteria.
(b) One of the evaluation criteria decided upon at this meeting is “cost/ benefit”, as the company needs to be able to show that the new system will have been a good investment within twelve months of its implementation.
Describe three other possible criteria, saying why each is appropriate in this situation.</td><td></td></tr>
<tr><td></td><td>(a) The following are examples only.
• To establish client needs (1)
• Both parties have a clear understanding of the problem at hand (1)
• To find out what is essential and desirable (1)
• So suitable software can be sought out (1)
• To ensure the departments have ownership/involvement (1)
2 x 1 mark
(b) Give one mark for a stating a criterion, one mark for an explanation of what this criterion is, and one mark for an expansion of this in the context of a company. Refer to page 29 of the specification for a list of acceptable criteria. The following are examples only.
<table>
<tr><td>Criterion</td><td>Reason</td></tr>
<tr><td>Robustness</td><td>The company will be dealing with vast quantities of data (1) and the software will have to cope without crashing (1).</td></tr>
<tr><td>Performance</td><td>The company will require results to be produced in a reasonable time (1) so the software package must be more efficient than current methods (1).</td></tr>
<tr><td>Support</td><td>The company will require access to support initially as training (1), but also in future if things go wrong (1).</td></tr>
<tr><td>Portability</td><td>The company may use other software to create reports (1), and so this package must have an export function (1).</td></tr>
<tr><td>Transferability</td><td>Any existing data the company holds with regard to inventory needs to be available (1) without the need for re-entering data (1).</td></tr>
</table>
3 x (3,2,1,0) marks</td><td>(2 marks)

(9 marks)</td></tr>
</table>

6	*There are many different options when providing software solutions to specialist problems.* (a) *Describe **one** advantage and **one** limitation of purchasing "off-the-shelf" packages.* (b) *Describe **one** advantage and **one** limitation of leasing software licences.* (c) *Describe **one** advantage and **one** limitation of using an in-house development team to create bespoke solutions.* (d) *Describe **one** advantage and **one** limitation of using an external software house to create bespoke solutions.*	
	For all a-d: Award **one** mark for a simple **statement** and an **additional** mark for **expanding** on this. Do **not** allow cheap/expensive/cost on its own. Must be **cheaper than** for **first** mark and **expansion** for **second** mark. The following are examples only: (a) Advantage Cheaper than bespoke (1) as mass produced (1) Limitation As designed for many (1) may lack functionality required (1) **2 x (2,1,0) marks**	*(4 marks)*
	(b) Advantage Cheaper to pay for lease than having to purchase software (1) so may be able to have more copies available for use (1) Limitation When the lease ends all copies of the software must be removed (1) which will take time (1) **2 x (2,1,0) marks**	*(4 marks)*
	(c) Advantage Support should be easily available (1) as the development team are already part of the company (1) Limitation Solution may require skills that the team do not possess (1) meaning that more people have to be employed (1) **2 x (2,1,0) marks**	*(4 marks)*
	(d) Advantage A contract is in place (1) so there can be clauses to do with late delivery (1) Limitation It may take a long time to produce the system (1) as the external team has to find out how the system fits company business needs(1) **2 x (2,1,0) marks**	*(4 marks)*

7	*When designing computer systems, it is important to consider how interaction with a human will take place* *Describe, with the aid of examples,* ***three*** *factors that need to be addressed when considering Human/ Computer Interaction.*	

	In responses to this question, 6 marks are available for descriptions of Human/ Computer Interaction (code as **D**), and 3 marks are available for good examples (code as **E**). The following are examples.
	
	• Appropriate input (1)
	  o To user/to task/device(1)
	  o Example(1)
	• Appropriate output (1)
	  o To user/to task/format/device (1)
	  o Example (1)
	• Interface issues (1)
	  o Menus/layout/colour and text/icons/pictures (1)
	  o Example (1)
	• 'User friendly' (1)
	  o Help systems/error messages/instructions/wizards (1)
	  o Example (1)
	• Easier access to tasks (1)
	  o Shortcuts/macros/automation of common tasks (1)
	  o Example (1)
	• The user themselves (1)
	  o Memory/skill/age/disabilities (1)
	  o Example (1)
	3 x (2,1,0) D marks + 3 x 1 E marks
		(9 marks)

8	*A computer repair service uses different information systems to keep records of clients, current jobs and parts held in stock. These are accessible from a number of workstations, on a Local Area Network, which are used by several employees.* (a) *Describe **four** factors that need to be addressed in forming a suitable backup strategy that the company can use.* (b) *The manager of the company feels that some of his employees are misusing the network facilities as he has noticed an increase in the use of printer consumables.* *Explain **one** method the manager can use to monitor and control the usage of the printers on the network.*	
	(a) The following are examples only. • What media (1); media must have enough capacity to hold the backup (1) • What frequency (1); backup should occur often enough to ensure minimal loss of data/not so frequent that it impinges on the business function (1) • What content (1); a decision needs to be made as to which files need to be backed up all the time, and which files are more likely to be backed up on a more ad hoc basis (1) • Where stored (1); the backup should not be vulnerable to the same threats as the data (1) • Who's responsible (1); someone/ a set of people should be allocated the task of carrying out/ ensuring the backup takes place (1) • How is it logged (1); a record needs to be held, so that it is known who carried out the latest backup and when (1) • Recovery testing (1); there has to be some way of knowing that the backup has been successful (1) • Time of backup (1); at what time of day should the backup be completed (1) **4 x (2,1,0) marks** (b) The following are examples only. • Use of network activity monitoring/ auditing (1) • To show who is doing what, when (1) • Abusers can be pinpointed/contacted (1) • Use of network accounting software (1) • Each user can have output restricted/quota imposed (1) • If they exceed their limit, they can't print (1) **3 x 1 mark**	*(8 marks)* *(3 marks)*

9	*A large company has many retail outlets around the United Kingdom selling consumer electronic devices such as televisions, audio equipment and personal digital assistants. The current stock control system in now inadequate for the company's business needs* *An important decision for the company to make is how to implement its new stock control system. It is essential that each outlet will have access to the stock control data of all the other outlets. Each outlet must also have control over its own stock.* *Discuss how this company might implement a stock control database system with the above features.* *Include in your discussion consideration of the following issues:* • *resource requirements;* • *management of the data;* • *management of the system.* *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: Resource requirements (code as **R**) – 6 marks Management of data (code as **D**) – 6 marks Management of the system (code as **S**) – 6 marks Quality of written communication (code as **Q**) – 4 marks Maximum mark for content is 16/20 *Resource requirements (**R marks**)* Award one mark for a relevant point and an additional mark for an expansion. • Human Resources • Hardware Resources • Software Resources • Network Resources **max 6 marks** *Management of data (**D marks**)* Award one mark for a relevant point and an additional mark for an expansion. • Distributed database • Client/server database • Data consistency • Data integrity • Data transfer **max 6 marks**	

	*Management of the system (**S marks**)* Award one mark for a relevant point and an additional mark for an expansion. • Access Rights • Technical Support • Security • Backup • Audit • Changeover method **max 6 marks**	*(20 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.	