



General Certificate of Education

Information and Communications Technology 6521

ICT5 Information: Policy, Strategy and Systems

Mark Scheme

2005 examination - June series

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.

GENERAL GUIDANCE NOTES FOR EXAMINER

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. Where a mark is only available if there is a previous correct response, i.e. a dependent mark, then this will be indicated on the mark scheme.
10. 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

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

- 20.** 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.
- 21.** The use of the following symbols/marks is acceptable:
- 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.
 - Underlining of subject specific terminology, which is misused or incorrect e.g. encoding rather than encryption, information rather than data.
 - 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.
 - 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.
 - 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.
 - 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.**
- 22. NO** other symbols or comments should be used.
- 23.** Markers are responsible for checking
- The transposition of marks to the front sheet
 - That all work has been marked on each script
 - That all marks for individual questions are totalled correctly
 - That the script total is transferred to the box at the top right of the script.
 - 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.

Information: Policy, Strategy and Systems ICT 5

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	<i>List four psychological factors that need to be considered when designing human/computer interaction.</i>	<i>4 marks</i>
	<p>One mark per response , up to a maximum of four. The following are examples. Credit any reasonable response.</p> <ul style="list-style-type: none"> • User-friendly or example • Give help to novices or example • Provide shortcuts for experts or example • Make use of human long-term memory or example <p style="text-align: right;">4 x 1 mark</p>	
2	<p>(a) <i>Give two ways by which data can be transferred between different applications on the same computer system.</i></p> <p>(b) <i>Give two ways by which data can be transferred between different computer systems.</i></p>	<p>2 marks</p> <p>2 marks</p>
	<p>(a)</p> <ul style="list-style-type: none"> • Standard data formats/a recognisable example of a standard file format e.g. .jpeg, .mp3, .gif/Import and Export(1) • OLE/DDE (1) • Copy and Paste /Drag and Drop(1) <p style="text-align: right;">2 x 1 mark</p> <p>(b)</p> <ul style="list-style-type: none"> • Compatible media formats/example of a standard format e.g. ISO CD-ROM, ZIP disks. (1) • E-mail file attachments (1) • Sharing over a network/example of a network e.g. LAN, WAN (1) <p style="text-align: right;">2 x 1 mark</p>	

<p>3</p>	<p><i>Computer networks are an integral part of life in the 21st century. The infrastructure must be efficient if these networks are to be of use.</i></p> <p>(a) <i>Define the term client, as it applies to computer networks.</i></p> <p>(b) <i>Define the term server, as it applies to computer networks.</i></p> <p>(c) <i>Describe two advantages of a client/server database over a non-client/server database.</i></p> <p>(d) <i>Explain the rôle of routers in computer networks.</i></p>	<p>2 marks</p> <p>2 marks</p> <p>4 marks</p> <p>2 marks</p>
	<p>(a) One mark for each point made, up to 2 marks. E.g.;</p> <ul style="list-style-type: none"> • local workstation/computer/software (1) • makes requests for applications/data to a server (1) • may not have a lot of local processing power (1) <p style="text-align: right;">2 x 1 mark</p> <p>(b) One mark for each point made, up to 2 marks. E.g.;</p> <ul style="list-style-type: none"> • remote/powerful computer (1) • provides resources/data to clients(1) • point at which processing is carried out (1) <p style="text-align: right;">2 x 1 mark</p> <p>(c) First mark for stating <u>advantage</u>, and second mark for saying <u>why</u> better than a non-client/server database. Ensure that marks are awarded for points related to client/server <u>database</u> not client/server <u>network</u></p> <ul style="list-style-type: none"> • expensive resource is made available to a large user base (1) ; this is more cost effective (1) • consistency of the data is maintained (1); only one copy of the data is held on the server, rather than copies held on workstations (1) • processing is done at the server (1); the client does not need to be so powerful (1) • communication between client and server is minimal (1); only requests and results are communicated, rather than entire databases (1) • Department specific report formats or queries can be held on workstations (1) meaning that less room is taken up on the server/these are less likely to be accessed by the ‘wrong’ people (1) <p style="text-align: right;">2 x (2,1,0) marks</p> <p>(d) one mark per point, up to a maximum of two points. The following are examples.</p> <ul style="list-style-type: none"> • Let traffic flow between networks/ allow access to other networks/use as a gateway (1) • Best path determination/ decides next portion of journey (1) • Switching function/ takes packet from one network/interface and moves it to another (1) • Allow build up a knowledge of the network(s) (1) • Allow packet filtering/use as a firewall (1) <p style="text-align: right;">2 x 1 mark</p>	

<p>4</p>	<p><i>The secretary of a local charity is constructing a database on behalf of the committee. It will be used to store data on events, and ticket sales for those events, including who has purchased them. He has been told that a relational database management system can assist him. Having found an article on relational database construction, he does not understand some of the terms it contains. He asks you for advice.</i></p> <p><i>(a) Explain the following terms:</i></p> <p><i>(i) normalisation;</i></p> <p><i>(ii) data independence;</i></p> <p><i>(iii) data consistency;</i></p> <p><i>(iv) data integrity.</i></p> <p><i>(b) The secretary constructs his database and then asks you to examine his work before he enters any data. You notice that he has not included any validation.</i></p> <p><i>With the aid of an example, explain why data validation is important.</i></p> <p><i>(c) Give three reasons why he should consult with other members of the charity's committee before finalising the design of his database system.</i></p>	<p>2 marks</p> <p>2 marks</p> <p>2 marks</p> <p>2 marks</p> <p>3 marks</p> <p>3 marks</p>
	<p>(a)</p> <p>(i) Process of breaking down complex data structures into simpler forms. (1) + expansion/ example (1)</p> <p style="text-align: right;">2 marks</p> <p>(ii) Changes in the structure of the data only affects those programs/ functions that are reliant on that part of the structure(1)+ expansion/ example (1)</p> <p>OR</p> <p>Data structure is separate from the programs that access it (1) + expansion/ example (1)</p> <p style="text-align: right;">2 marks</p> <p>(iii) Data is only stored once, and this is the sole source of that data. (1) + expansion/ example (1)</p> <p style="text-align: right;">2 marks</p> <p>(iv) How trustworthy/how reliable the data is/ correctness of data. (1) + expansion/ example (1)</p> <p style="text-align: right;">2 marks</p> <p>(b)</p> <ul style="list-style-type: none"> • What is validation (1) • What can you validate (an example of a field, e.g. National Insurance Number) (1) • How do you validate (an example of a validation method e.g. format check) <p style="text-align: right;">Max 3 marks</p>	

	<p>(c)</p> <p>NB answers must be in the context of before the system is created.</p> <ul style="list-style-type: none">• to ensure that the data they require is recorded on the system (1)• to find out what training/ documentation may be needed by other members in order to make use of the system (1)• to ensure that the system can create the relevant outputs that different members require (1)• or any other sensible reasons (1 per reason up to a maximum of three) <p style="text-align: right;">3 x 1 mark</p>	
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<p>5</p>	<p><i>A company has a computer network system. Activity on this network is monitored by software and an accounting log is automatically produced so that departments can be charged for their use of system resources.</i></p> <p><i>(a) State four items of data that this log might include.</i></p> <p><i>(b) Give four reasons why such a log is useful.</i></p>	<p>4 marks</p> <p>4 marks</p>
	<p>(a) maximum 4 from:</p> <ul style="list-style-type: none"> • a record of facilities used by each person including processor time(1), • no of pages printed (1) • disk space used (1). • details of systems failures/ crashes/error messages (1) • details files stored/ updated/deleted (1) • details of e-mail usage/storage (1) • IDs of logged-on users/who (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/ no. of licenses used (1) • details of network traffic (1) • details of failed login attempts (1) <p style="text-align: right;">4 x 1 mark</p> <p>(b) maximum 4 from:</p> <ul style="list-style-type: none"> • provide systems administration with information about network load (1) • monitoring software licenses (1) • enable administrators to deal with network performance problems (1) • facilitate sensible distribution of resources to users (1) e.g. memory/ time/ printers/ etc. • to limit use of scarce resources (1), • inform decisions about any upgrade or systems enhancement (1) • help in tracking abuse of network (1) • enable administrator to identify and support novice users (1) <p style="text-align: right;">4 x 1 mark</p>	

<p>6</p>	<p><i>A large retail company is considering a new computerised help desk system for recording and supporting ICT-related problems.</i></p> <p>(a) Name two ways in which this software could be obtained.</p> <p>(b) Describe three factors that might affect the company's decision on how to obtain this software.</p>	<p>2 marks 6 marks</p>										
	<p>(a) One mark per stated method of acquisition, up to a maximum of 2.</p> <ul style="list-style-type: none"> • In-house development • External consultancy/development • Purchase/Leasing pre-written software <p>Allow adapting/customising generic software package in this instance only (1)</p> <p style="text-align: right;">2 x 1 mark</p> <p>(b) One mark for naming a relevant factor, and one mark for a suitable description. The following are examples.</p> <table border="1" data-bbox="288 891 1209 1279"> <tr> <td>Company policy (1)</td> <td>does the company insist on using a certain method? (1)</td> </tr> <tr> <td>Time considerations (1)</td> <td>how long do is there until the new software has to be in place? (1)</td> </tr> <tr> <td>Cost comparisons (1)</td> <td>Why a difference in cost arises (1)</td> </tr> <tr> <td>Personnel (1)</td> <td>are there people with the skills available to create the new software? (1)</td> </tr> <tr> <td>Reputation (1)</td> <td>Is the company trustworthy?/established/experienced in the field (1)</td> </tr> </table> <p style="text-align: right;">3 x (2,1,0) marks</p>	Company policy (1)	does the company insist on using a certain method? (1)	Time considerations (1)	how long do is there until the new software has to be in place? (1)	Cost comparisons (1)	Why a difference in cost arises (1)	Personnel (1)	are there people with the skills available to create the new software? (1)	Reputation (1)	Is the company trustworthy?/established/experienced in the field (1)	
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<p>7</p>	<p><i>A software development company has created an image manipulation package.</i></p> <p><i>(a) Describe the process of testing you would expect to happen before this package is released to the general public.</i></p> <p><i>(b) After it has been released, users find that the software “crashes”.</i></p> <p><i>Explain why this may be the case.</i></p> <p><i>(c) During the life of the software, the company produces several maintenance releases.</i></p> <p><i>i) Describe three reasons why maintenance releases may be required.</i></p> <p><i>ii) Describe one way that the maintenance releases may be distributed.</i></p>	<p>4 marks</p> <p>2 marks</p> <p>6 marks</p> <p>2 marks</p>
	<p>(a) The following are examples only. The first two marks are for describing ‘alpha’ testing, the second two marks for describing ‘beta’ testing. It is important to credit the concepts not the phrases.</p> <ul style="list-style-type: none"> • alpha testing (1) • testing done by the development company itself (1) • unit and system testing (1) • using a restricted test data set (1) • to make sure that all the components work together as expected (1) <ul style="list-style-type: none"> • beta testing (1) • testing done by a select number of end-users (1) • user acceptance testing (1) • using real data in a real environment /using the software in unexpected ways (1) • to get feedback to fix/enhance/improve the software (1) <p style="text-align: right;">4 x 1 mark</p> <p>(b) The following are examples only.</p> <ul style="list-style-type: none"> • Software is complex (1) • even after release it still may be used unexpectedly (1) • Combination with other hardware or software (1) • conflicts causing unexpected problems (1) <p style="text-align: right;">2 x 1 mark</p>	

	<p>(c)</p> <p>(i) A maximum of two marks each point. Award any two out of the three noted here.</p> <ul style="list-style-type: none">• corrective maintenance (1)• in order to fix logical errors in the software (1)• example in context e.g. misinterpreting graphic file type(1) • adaptive maintenance (1)• in order to deal with changes that may affect use of the software (1)• example in context e.g. introduction/change to ‘standard’ graphics file formats (1) • perfective maintenance (1)• in order to add extra functionality to the software (1)• example in context e.g. add rotate function (1) <p style="text-align: right;">3 x (2,1,0) marks</p> <p>(ii)</p> <ul style="list-style-type: none">• One mark for how users find the patch/ how the company is aware of the user/register user• One mark for how the user receives the patch <p style="text-align: right;">2 marks</p>	
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<p>8</p>	<p>A company has been using a particular accounting package for several years, and it is considering whether to upgrade or to replace the software with an alternative package.</p> <p><i>Describe four criteria that the company might use to evaluate alternative accounting packages.</i></p>	<p>8 marks</p>																		
	<p>Give 1 mark for naming the criterion and 1 for describing it in each case. Refer to p29/30 of the specification for the list of acceptable criteria.</p> <table border="0"> <thead> <tr> <th data-bbox="435 591 536 618">Criterion</th> <th data-bbox="786 591 868 618">Reason</th> </tr> </thead> <tbody> <tr> <td data-bbox="435 622 580 649">Functionality</td> <td data-bbox="786 622 1225 689">The software will have to provide all the required functions (1).</td> </tr> <tr> <td data-bbox="435 694 560 721">Robustness</td> <td data-bbox="786 694 1230 761">The software will have to deal with large amounts of data without crashing(1).</td> </tr> <tr> <td data-bbox="435 766 576 792">Performance</td> <td data-bbox="786 766 1177 833">The software can be measured using benchmark tests (1).</td> </tr> <tr> <td data-bbox="435 837 523 864">Support</td> <td data-bbox="786 837 1193 904">Is there access to support such as training/helpdesks/documentation (1).</td> </tr> <tr> <td data-bbox="435 909 596 936">Transferability</td> <td data-bbox="786 909 1219 976">Any existing data should be available to the new software package (1).</td> </tr> <tr> <td data-bbox="435 981 740 1048">Appropriateness/ Suitability to end user</td> <td data-bbox="786 981 1230 1048">Can't guarantee ICT literacy level of end user (1)</td> </tr> <tr> <td data-bbox="435 1048 740 1075">(NB NOT EASE OF USE)</td> <td></td> </tr> <tr> <td data-bbox="435 1079 772 1106">Futureproofing/ Upgradeability</td> <td data-bbox="786 1079 1161 1146">Are upgrades available/what is the frequency of upgrades? (1)</td> </tr> </tbody> </table> <p style="text-align: right;">4 x (2,1,0) marks</p>	Criterion	Reason	Functionality	The software will have to provide all the required functions (1).	Robustness	The software will have to deal with large amounts of data without crashing(1).	Performance	The software can be measured using benchmark tests (1).	Support	Is there access to support such as training/helpdesks/documentation (1).	Transferability	Any existing data should be available to the new software package (1).	Appropriateness/ Suitability to end user	Can't guarantee ICT literacy level of end user (1)	(NB NOT EASE OF USE)		Futureproofing/ Upgradeability	Are upgrades available/what is the frequency of upgrades? (1)	
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<p>9</p>	<p><i>A local health authority has decided to standardise the ICT systems across all departments.</i></p> <p><i>Discuss the above decision. Include in your answer:</i></p> <ul style="list-style-type: none"> • <i>the benefits that the staff may gain from the standardisation;</i> • <i>the benefits that the health authority may gain from the standardisation;</i> • <i>the reasons why staff may not wish to change to a new system.</i> <p><i>The quality of written communication will be assessed in your answer.</i></p>	
	<p>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.</p> <p>Allocation of marks:</p> <p>Up to 6 marks for benefits to staff (code as S) Up to 6 marks for benefits to the health authority (code as H) Up to 6 marks for why staff may be resistant to change (code as R)</p> <p>Marks can either be awarded for separate concepts (one per concept), or for one per concept with a second mark available for a good expansion/description. In either case the maximum mark for each section is as noted above.</p> <p>Maximum mark for content is 16/20. Up to 4 marks are available for the assessment of Quality of Written Communication (code as Q).</p> <p>BENEFITS TO STAFF (S marks)</p> <ul style="list-style-type: none"> • ease of learning (1) • easier transfer of skills (1) • flexibility of work location (1) • users are able to support each other (1) • use of templates(1) • easier communication (1) <p>BENEFITS TO HEALTH AUTHORITY (H marks)</p> <ul style="list-style-type: none"> • less training overhead (1) • perceived image of health authority may improve (1) • easier quality control (1) • easier to manage licensing (1) • upgrades will be easier to administer (1) • security is easier to monitor (1) <p>RESISTANCE TO CHANGE (R marks)</p> <ul style="list-style-type: none"> • effect on staff morale (1) • lack of consultation/discussion with staff(1) • staff may perceive constant change has occurred (1) • staff feel current skills are undervalued/ no longer of use (1) • staff perceive training as a waste of time (1) 	

	<ul style="list-style-type: none"> • consideration of skill level of user (1) • less control over software (1) • availability of specific software (1) • original system served user perfectly well (1) • credit points that provide solution to problems of resistance (1 per point) 	
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.	20 marks
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. Max 4 marks	