



General Certificate of Education

Information and Communication Technology 6521

Unit 5 Information: Policy, Strategy and Systems

Mark Scheme

2007 examination - January 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.

Further copies of this Mark Scheme are available to download from the AQA Website: www.aqa.org.uk

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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 street” 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 is 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, c 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 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/signs 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
- 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.

Information: Policy, Strategy and Systems/ Unit 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.

| | | |
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| 1 | <p>14.1 Policy and Strategy Issues</p> <p>List four topics that should be included in an organisation's backup strategy.</p> | (4 marks) |
| | <p>Any four:</p> <ul style="list-style-type: none"> • Medium to use (1) • Frequency (1) • Where/how to store (1) • Type (incremental/full) (1) • Security of backup (1) • Content/ which files (1) • Volume of data (1) • Who is going to make the backup/personnel (1) • Logging/ documentation (1) • Recovery testing (1) • Timing / can the system be taken offline in order to backup? (1) <p style="text-align: right;">max 4 marks</p> | |

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| <p>2</p> | <p>14.2 Software 14.3 Database Management Concepts</p> <p><i>A company needs a new Database Management System (DBMS).</i></p> <p>(a) <i>What is the purpose of a DBMS?</i></p> <p>(b) <i>The company is considering several different DBMS software packages.</i></p> <p><i>What procedures should be followed when evaluating the software packages?</i></p> | <p>(3 marks)</p> <p>(3 marks)</p> |
| | <p>(a) Any three:</p> <ul style="list-style-type: none"> • permits data definition / construction/structure of database/data dictionary/ separate tables with linked fields (1) • provides interface between user and data (1) • allows data to be interrogated / queried (1) • allows construction of reports/data to be organized/manipulated (1) • controls access to the data/security (1) • storage of data (1) <p style="text-align: right;">max 3 marks</p> <p>(b)</p> <ul style="list-style-type: none"> • establish user requirements (1) • establish software capabilities (1) • match user requirements to software capabilities (1) • establish hardware compatibility (1) • establish software compatibility (1) <p>On this occasion <u>only</u>, allow up to 1 mark for any combination of references to evaluation criteria, if an explanation in context is given.</p> <p style="text-align: right;">max 3 marks</p> | |

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| 3 | <p>14.10 Portability of Data</p> <p>(a) Give three ways by which data can be transferred successfully between different applications on the same computer system.</p> <p>(b) Describe two ways by which files can be transferred successfully between different computer systems.</p> | <p>(3 marks)</p> <p>(4 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) • Mailmerge (1) <p style="text-align: right;">3 x 1 mark</p> <p>(b)</p> <ul style="list-style-type: none"> • Compatible media formats / portable media formats (1) example of a standard format e.g. ISO standards, CD-RW, USB, ZIP disks. (1) • E-mail (1) using file attachments (1) • Sharing over a network (1) example of a network e.g. LAN, WAN (1) • Wireless connectivity (1) Bluetooth / infra red etc (1) • Emulation software (1) to allow transfer between different platforms / OS (1) <p style="text-align: right;">2 x (2, 1, 0) marks</p> | |

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| 4 | <p>14.5 Networks</p> <p>(a) <i>Security problems can arise when using computer networks.</i></p> <p><i>Name two methods of protecting the security of a computer network, and describe how each one protects the network.</i></p> <p>(c) <i>Network accounting software records network usage data.</i></p> <p><i>Give three items of network usage data which may be recorded and, for each one, describe how the network administrator may make use of it.</i></p> | <p>(4 marks)</p> <p>(6 marks)</p> |
| | <p>(a) Answers must relate to the security of a network - not just a computer room. method (1) description (1)</p> <ul style="list-style-type: none"> • Use encryption / https (1) so that anyone getting hold of the data is not able to make sense of it (1) • Use passwords/ logins (1) to deter unauthorised access to the system (1) • Set access levels (1) to control access to selected parts of the system (1) • Use up to date anti-virus / protection software (1) to protect network from corruption / intrusion (1) • Use procedures for the use of removable media (1) avoid viruses (1) • Use a firewall (1) e.g. to provide a filter on traffic coming in/ going out (1) <p style="text-align: right;">max 2 x (2, 1, 0)</p> <p>(b) data item (1) expansion/description of use (1) e.g.</p> <ul style="list-style-type: none"> • resources e.g. printer / consumables (1) to encourage economical use (1) • application software / communications software / email / internet use (1) e.g. to inform licensing decisions (1) • network traffic (1) to encourage off peak usage (1) • processor use (1) to assist predicting future hardware requirements (1) • hard disk space (1) to re-allocate according to departmental needs (1) <p>allow 'to bill appropriately' as expansion ONCE only</p> <p style="text-align: right;">max 3 x (2, 1, 0)</p> | |

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| 5 | <p>14.6 Human/Computer Interaction</p> <p><i>The design of interfaces for human/computer interaction needs to take psychological factors into account.</i></p> <p><i>Using a different example for each one, describe how the following might be of benefit to the user:</i></p> <p>(a) <i>providing short cuts for experts</i></p> <p>(b) <i>giving assistance to novices</i></p> <p>(c) <i>making use of human long-term memory.</i></p> | <p>(3 marks)</p> <p>(3 marks)</p> <p>(3 marks)</p> |
| | <p>(a) e.g. user can press e.g. ctrl + letter / function key (1) to gain rapid access to functions (1) + additional benefit (1)</p> <p style="text-align: right;">max (3, 2, 1, 0)</p> <p>(b) help / wizards / menus (1) user can click on help/press F1 (1) to get guidance to solve problem (1)</p> <p style="text-align: right;">max (3, 2, 1, 0)</p> <p>(c) menu structure (1) users remember which functions are in which sub-menus (1) enables all functionality to be accessed as series of limited selections (1)</p> <p style="text-align: right;">max (3, 2, 1, 0)</p> | |

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| 6 | <p>14.9 Reliability of Software</p> <p><i>A software house produces a maintenance release for its spreadsheet software.</i></p> <p><i>(a) Explain three reasons why this maintenance release may have been needed.</i></p> <p><i>(b) Describe one way in which this maintenance release could be distributed.</i></p> | <p><i>(6 marks)</i></p> <p><i>(2 marks)</i></p> |
| | <p>(a)</p> <p>Any two per type of maintenance:</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. can't paste as appropriate data type(1) • adaptive maintenance (1) • in order to deal with changes that may affect use of the software (1) • example in context e.g. change affecting currency (1) • perfective maintenance (1) • in order to add extra functionality to the software (1) • example in context e.g. add new graph type (1) <p style="text-align: right;">3 x (2,1,0) marks</p> <p>(b)</p> <p>Way in which distributed (1) expansion (1)</p> <ul style="list-style-type: none"> • company emails registered users (1) email links users to website where patch is available to download and install (1) • automated online update (1) on running software, pop up offers download (1) <p style="text-align: right;">max (2, 1, 0)</p> | |

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| 7 | <p>14.8 Software Development</p> <p><i>A company needs new software for a specialist application.</i></p> <p>(a) Name three ways of providing a software solution for a specialist application and, for each one, give a drawback of providing the software in that way.</p> <p>(b) Describe three criteria for selecting a software solution for a specialist application.</p> | <p>(6 marks)</p> <p>(6 marks)</p> |
| | <p>(a) way of providing software (1) drawback (1)</p> <ul style="list-style-type: none"> • purchasing an ‘off-the-shelf’ package (1) may not provide all required functionality (1) • leasing software (1) software must be uninstalled at end of lease (1) • bespoke solution created in-house (1) may require skills not available in-house (1) • bespoke solution created by software house (1) takes time to produce (1) • customising generic package (1) paying for functions that are not required (1) <p style="text-align: right;">max 3 x (2, 1, 0)</p> <p>(b) criterion (1) description (1)</p> <ul style="list-style-type: none"> • Company policy (1) does the company insist on using a certain method? (1) • Time available (1) how long until the new software has to be in place? (1) • Cost comparisons (1) why a difference in cost arises (1) • Personnel / training (1) are people available with skills to create new software? (1) • Reputation (1) is software company trustworthy?/established/experienced in the field? (1) <p>On this occasion <u>only</u>, allow up to 2 marks for evaluation criteria, if an expansion in context is given.</p> <p style="text-align: right;">max 3 x (2, 1, 0)</p> | |

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| 8 | <p>14.7 Human/Computer Interface</p> <p><i>Information systems make use of user interfaces of different types.</i></p> <p>(a) Give three features of a Graphical User Interface (GUI). <i>(3 marks)</i></p> <p>(b) Name two different system resources and, for each one, give a reason why it may be affected by the demands of a GUI. <i>(4 marks)</i></p> <p>(c) Give one example of where a menu driven interface could be used. <i>(1 mark)</i></p> <p>(d) Describe three characteristics of a menu driven user interface. <i>(6 marks)</i></p> | | | | | | | | | | | | | | | |
|--|--|----------|-----------------|-------------|--|----------------------------------|---|--|--|-----------------------|--|-----------------|---|-----------|---------------------------------------|--|
| | <p>(a)</p> <p>Any three: Credit well expressed other features.</p> <ul style="list-style-type: none"> • windows//panes//dialogue/list/check boxes//toolbars//scroll bars (1) • icons/pictures/buttons (1) • menus//popups//menu/action/status bars (1) • pointer/mouse/click/drag and drop (1) • ability to customise (1) <p style="text-align: right;">max (3x1)</p> <p>(b)</p> <p>1 mark for naming a resource, 1 for reason affected</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 50%; text-align: center;">Resource</th> <th style="width: 50%; text-align: center;">Reason affected</th> </tr> </thead> <tbody> <tr> <td>• processor</td> <td>• multitask while generating smooth and rapid graphics for GUI</td> </tr> <tr> <td>• Hard Disk Drive/ Backing Store</td> <td>• a GUI requires many lines of code/ images which need to be stored</td> </tr> <tr> <td>• RAM/ Immediate Access Store / Main Store</td> <td>• large amounts of code/images need to be held in memory for execution</td> </tr> <tr> <td>• Input devices/mouse</td> <td>• the interface needs ‘point and click’ in order to function</td> </tr> <tr> <td>• graphics card</td> <td>• will allow the CPU to be dedicated to other tasks</td> </tr> <tr> <td>• monitor</td> <td>• to display high resolution graphics</td> </tr> </tbody> </table> <p style="text-align: right;">2 x (2,1,0)</p> <p>(c)</p> <p>appropriate application (1) max 1 mark</p> | Resource | Reason affected | • processor | • multitask while generating smooth and rapid graphics for GUI | • Hard Disk Drive/ Backing Store | • a GUI requires many lines of code/ images which need to be stored | • RAM/ Immediate Access Store / Main Store | • large amounts of code/images need to be held in memory for execution | • Input devices/mouse | • the interface needs ‘point and click’ in order to function | • graphics card | • will allow the CPU to be dedicated to other tasks | • monitor | • to display high resolution graphics | |
| Resource | Reason affected | | | | | | | | | | | | | | | |
| • processor | • multitask while generating smooth and rapid graphics for GUI | | | | | | | | | | | | | | | |
| • Hard Disk Drive/ Backing Store | • a GUI requires many lines of code/ images which need to be stored | | | | | | | | | | | | | | | |
| • RAM/ Immediate Access Store / Main Store | • large amounts of code/images need to be held in memory for execution | | | | | | | | | | | | | | | |
| • Input devices/mouse | • the interface needs ‘point and click’ in order to function | | | | | | | | | | | | | | | |
| • graphics card | • will allow the CPU to be dedicated to other tasks | | | | | | | | | | | | | | | |
| • monitor | • to display high resolution graphics | | | | | | | | | | | | | | | |

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| | <p>(d) characteristic (1) description/expansion (1)</p> <ul style="list-style-type: none">• restricted options (1) so data is validated/user is less likely to make errors (1)• easy to learn /use / navigate (1) to access functions (1)• Only requires a simple input device(1) e.g. a set of buttons (1)• Guides/ controls user through the system (1) so user IT literacy not an issue (1)• hierarchical nature (1) structure is logical e.g. withdrawal amounts are together (1) <p style="text-align: right;">3 x (2,1,0) marks</p> | |
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| 9 | <p>14.4 Communication and Information Systems</p> <p><i>You are employed as an ICT consultant to an expanding tyre-fitting company. The company is planning to operate nationally, and is setting up new centres across the country. Your task is to advise on a computer network to connect the centres, and on the best method of storing and providing access to the company's data.</i></p> <p><i>Write a report for the owners of the company, paying particular attention to:</i></p> <ul style="list-style-type: none"> • <i>the advantages of computer networks,</i> • <i>the nature and advantages of a distributed database,</i> • <i>the nature and advantages of a client-server database.</i> <p><i>The quality of written communication will be assessed in your answer.</i></p> | (20 marks) |
| | <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> <ul style="list-style-type: none"> • Advantages of computer networks (code as N) - 6 marks maximum • Nature and advantages of a distributed database (code as D) - 6 marks maximum • Nature and advantages of a client-server database (code as C) - 6 marks maximum. <p style="text-align: center;">Maximum mark for content is 16/20</p> <ul style="list-style-type: none"> • Quality of written communication (code as Q) - 4 marks maximum. <p>Credit issue (1) plus further mark available for detailed expansion.</p> <p>Advantages of computer networks (N marks):</p> <ul style="list-style-type: none"> • instant communication with all staff (1) e.g. e-mail (1) • sharing software/files across company (1) e.g. using collaborative software (1) • few printers between many workstations (1) through sharing printers (1) • backup centrally coordinated (1) backup easier to control (1) • travel time and cost saved (1) through video conferencing (1) • everybody gets the information at the same time (1) over an intranet (1) • ability to do same work in any part of company (1) through hot desking (1) • can access work off site/ save travelling (1) through teleworking (1) • data sources external to the company can be accessed (1) via internet (1) • can e.g. track printer usage (1) through network audit function (1) <p>Look for advantages of any <u>corporate</u> use of networks.</p> <p>Advantages of distributed / client-server databases can be credited, but not twice.</p> <p style="text-align: right;">[max 6 marks]</p> | |

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| | <p>Nature and advantages of a distributed database (D marks): Examples only. Credit all reasonable issues and expansions.</p> <ul style="list-style-type: none"> • local storage of data (1) for local use (1) • local processing (1) under control of DBMS (1) • local applications (1) do not require data from other sites (1) • global applications (1) do require data from other sites (1) • transparent distribution (1) users do not have to engage with networking issues (1) • transparent transactions (1) integrity maintained across remote data (1) • reflects organizational structure (1) data located in the departments they relate to (1) • local control of data (1) users of data exercise control over it (1) • fault tolerance (1) local fault only affects local functions (1) • fast response to many queries (1) as queried data held locally (1) • modularity (1) subsystems can be disconnected, changed and reconnected without affecting other subsystems (1) <p style="text-align: right;">[max 6 marks]</p> <p>Nature and advantages of a client-server database (C marks): point (1) Examples only. Credit all reasonable answers</p> <p>Client:</p> <ul style="list-style-type: none"> • local workstation/computer/software (1) • provides user interface (1) • makes requests for queries/reports/applications/data to a server (1) <p>Server:</p> <ul style="list-style-type: none"> • remote computer (1) • point at which processing is carried out (1) • provides service/resources/query results/reports/data to clients (1) <p>Client-server:</p> <ul style="list-style-type: none"> • server more powerful than client (1) • Do not allow web browser or server/mail client or server (out of context). • cost-effective: clients are cheaper than servers (1) expensive resource is made available to a large user base (1) • data consistency is maintained (1) one copy of data is held on server, rather than copies held on workstations (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;">[max 6 marks]</p> | |
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| | (Q marks) = Quality of Written Communication Marks | |
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| 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. max 4 marks | |