



General Certificate of Education

Information and Communication Technology 5521

ICT 2 Information: Management and Manipulation

Mark Scheme

2006 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 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:
- 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.**
- 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.

Unit 2: Information; Management and Manipulation

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>Give two different methods of entering data into a computer system.</i>	<i>(2 marks)</i>
	<p>Topic 11.1 – Data capture</p> <p>NB QUESTION IS <u>GIVE</u></p> <ul style="list-style-type: none"> • (use of) keyboard • speech recognition /(using a) microphone • optical scanning/ use of web cam • Optical Character Recognition/OCR • Magnetic Ink Character Recognition/MICR • Optical Mark Recognition/OMR • use of touch screen • (selection from list using) mouse etc • use of sensors • use of barcode reader • transfer of pre-captured data from an external device e.g. digital camera <p>Max 2</p>	

2	<p><i>Name a mode of processing that would be suitable for each of the following ICT systems:</i></p> <p><i>(a) airline ticket booking;</i></p> <p><i>(b) production of electricity bills;</i></p> <p><i>(c) Internet banking;</i></p> <p><i>(d) controlling a nuclear power station.</i></p> <p><i>(One word answers are acceptable for this question.)</i></p>	<p><i>(1 mark)</i></p> <p><i>(1 mark)</i></p> <p><i>(1 mark)</i></p> <p><i>(1 mark)</i></p>
	<p>Topic 11.5 – Manipulation and/or Processing</p> <ul style="list-style-type: none"> • Interactive/Transaction/<u>Pseudo-Real-time</u> (Processing) • Batch (Processing) • Interactive/Transaction/<u>Pseudo-Real-time</u> (Processing) • Real-Time (Processing) <p>Examiners just total number of ticks then copy and circle NOT four separate marks</p>	

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3	<i>Give four advantages of using a relational database rather than a flat file information storage and retrieval system.</i>	<i>(4 marks)</i>
	<p>Topic 11.3 – Organisation of Data for effective retrieval</p> <ul style="list-style-type: none"> • Independence of data..... • from the programs/applications that make use of it •extra fields can be added/ changed/ deleted without affecting the use of other fields • Less (allow no) redundant data/less duplicated data... • leading to a reduction in file size(for larger files) • "Single input" principle/updating less time consuming • Consistency of data • Improved quality of management information • Increased productivity..... • ...as ad hoc information can be produced to meet particular needs • relationships between tables..... •allow extraction of linked information • Allows different views/ different access rights for <u>different parts of database</u> <p>Max 4</p> <p>NOT just queries, forms, reports part of DBMS</p>	

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4	<p><i>A personal computer is supplied with an operating system and a set of peripheral drivers.</i></p> <p>(a) <i>Explain the term operating system.</i></p> <p>(b) <i>Explain the term peripheral driver.</i></p>	<p><i>(3 marks)</i></p> <p><i>(3 marks)</i></p>
	<p>Topic 11. 4 – Software: Nature, Capabilities and Limitations</p> <p>(a)</p> <ul style="list-style-type: none"> • <u>System</u> software • allocates and monitors system resources • example e.g. memory management • provides User Interface • hides the complexity of the hardware from the user <p>Max 3</p> <p>(b)</p> <ul style="list-style-type: none"> • <u>System</u> software/utility • provides interface/communication between the computer/operating system/application package and peripheral • example e.g. printer driver • translates data into a form the computer/peripheral can understand • provides error messages <p>Max 3</p>	

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5	<p>(a) Explain two possible sources of error that can occur when data is entered into a computer system. (4 marks)</p> <p>(b) Name two methods of reducing data entry errors, and state how each method is used. (4 marks)</p>	<p>(4 marks)</p> <p>(4 marks)</p>
	<p>Topic 11.2 – Verification and Validation</p> <p>(a)</p> <ul style="list-style-type: none"> • changes are made from the original data as it is entered (1) e.g. transcription/transposition etc or a description of an example/ missed/ duplicated items (1) • use of inappropriate but acceptable format (1) e.g. mm/dd/yy instead of dd/mm/yy (1) • data provided incorrectly from source (1) original document completed incorrectly (1) • items that are automatically input are of poor quality (1) e.g. folded OMR forms, poorly trained voice recognition software (1) • Allow hardware/software failure (1) e.g. updates lost or repeated (1) <p>Max 2 x (2, 1, 0) 4</p> <p>(b)</p> <p>Verification</p> <ul style="list-style-type: none"> • checking by comparison that no alterations are made to data on first entry into the computer system /e.g. keying data twice and comparing on input/read after write check/checksum <p>Max 2</p> <p>Validation</p> <ul style="list-style-type: none"> • checking that data is sensible (allow suitable alternative word NOT CORRECT) / rejecting data that is unreasonable / e.g. Presence check/Format check etc/description/actual example . <p>Max 2</p> <p>NB can have name or description/example for 1 mark for both marks the name and the description/example must match.</p>	

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6	<i>Explain what is meant by the terms security of data and privacy of data.</i>	<i>(4 marks)</i>
	<p>Topic 11.8 – Security of data</p> <p>Security of data</p> <ul style="list-style-type: none"> • the application of safeguards to protect data/keeping data safe (1) e.g. use of passwords to <u>prevent access to data</u> (1).... • from accidental or •malicious modification, destruction or damage (doing something to the data that should not be allowed) • or from unauthorised access <p>Privacy of data</p> <ul style="list-style-type: none"> • some data should only be accessed by authorised personnel • authorised personnel have a responsibility not to disclose the private data to others • Privacy scenario e.g. in a doctors’ surgery the doctors may have access to patients’ clinical data and general data but the receptionists will only have access to the general data <p><i>Allow in either but not both</i></p> <ul style="list-style-type: none"> • data security ensures the integrity and privacy of data <p>Max 4 (allow a maximum of 3 points if only one term is explained, but try and award 2 and 2 if possible)</p>	

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7	<p><i>A company is reviewing its backup and recovery procedures.</i></p> <p>(a) <i>Describe three items that should be included in a backup procedure.</i></p> <p>(b) <i>State three actions that should be part of a recovery procedure.</i></p>	<p><i>(6 marks)</i></p> <p><i>(3 marks)</i></p>
	<p>Topic 11.8 – Security of data</p> <p>(a)</p> <ul style="list-style-type: none"> • Backup medium (1) expansion with examples or description (1) • Content/type of backup (1) expansion with examples or description (1) • Location of backup (1) expansion with examples or description (1) • Timing of backup (1) expansion with examples or description (1) • Frequency/regularity of backup (1) expansion with examples or description (1) • Security of backup (1) expansion with examples or description (1) • Responsibility for backup (1) expansion with examples or description (1) • Organisation of backup (1) expansion with examples or description (1) • Testing that backup works (1) expansion with examples or description (1) <p>Any 3 x (2, 1, 0)</p> <p>NB an expansion of one point may include reference to another one e.g The location of the backup is important as it must be kept in a secure place – this combines location with security.</p> <p>(b)</p> <ul style="list-style-type: none"> • Ensure that the hardware is available • Ensure that the software is available • Ensure that data is available • Ensure that staff will be available • Ensure that know their roles • Ensure that the communication links are known • Ensure that alternative accommodation for computer systems is available • Ensure that the system is still secure <p>Max 3</p>	

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8	<p>(a) <i>What is applications software?</i></p> <p>(b) <i>There are three different types of applications software: generic, specific and bespoke.</i></p> <p><i>Using an example, for each one, describe what is meant by:</i></p> <p style="padding-left: 20px;">(i) <i>generic software;</i></p> <p style="padding-left: 20px;">(ii) <i>specific software;</i></p> <p style="padding-left: 20px;">(iii) <i>bespoke software.</i></p> <p>(c) <i>Give three benefits to users of having a common user interface between applications packages.</i></p>	<p>(2 marks)</p> <p>(2 marks)</p> <p>(2 marks)</p> <p>(2 marks)</p> <p>(3 marks)</p>
	<p>Topic 11.4 – Software; nature capabilities and limitations</p> <p>Topic 11.10 – Human/Computer Interface</p> <p>(a)</p> <ul style="list-style-type: none"> • A (computer) program • designed to carry out a task that would need to be carried out even if computers did not exist/ suitable example e.g. writing a letter <p>NB task by itself is not enough</p> <p>Max 2</p> <p>(b)</p> <p>(i) Generic – used for many different tasks/day to day tasks (1) e.g. Word-processor/DTP/Spreadsheet/Database management software/ Integrated package (1)</p> <p>(ii) Specific – used for one type of task only (1) e.g. Payroll/CAD/CAM/Project Management/Music Software/ etc (1)</p> <p>(iii) Bespoke - made for one specific customer / tailoring of generic package for specific use (1) e.g. an example of software specially tailored/written for one specific customer (1)</p> <p>(c)</p> <ul style="list-style-type: none"> • after learning first package • ease of transfer of skills to different packages • shorter familiarisation/learning time for others • greater range of tasks/software accessible to users • fewer errors made by users • confidence building for naive users • less stressful when using multiple applications <p>Max 3</p>	

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9	<p><i>There are ten employees in a local estate agent’s office. Each employee uses a networked PC on a Local Area Network (LAN).</i></p> <p>(a) <i>Give four benefits to the office of using a network rather than stand-alone PCs.</i></p> <p>(b) <i>The office is part of a national chain that is connected together over a Wide Area Network (WAN).</i></p> <p style="padding-left: 20px;">(ii) <i>Explain the difference between a LAN and a WAN.</i></p> <p style="padding-left: 20px;">(iii) <i>Give two benefits to the estate agent’s office of using the WAN.</i></p> <p>(c) <i>The local office has purchased a digital camera to take pictures of the houses that it is selling.</i></p> <p style="padding-left: 20px;"><i>Give two benefits to the office of using a digital camera.</i></p>	<p>(4 marks)</p> <p>(4 marks)</p> <p>(2 marks)</p> <p>(2 marks)</p>
	<p>Topic 11.9 - Network Environments</p> <p>Topic 11.7 – Hardware; nature capabilities and limitations</p> <p>(a)</p> <ul style="list-style-type: none"> • centralisation of services... • e.g. software installation, backups, printing, security, monitoring etc <p>Allow two different examples of centralised services</p> <ul style="list-style-type: none"> • servers provide centralised storage (of data) • servers provide centralised storage of programs <p>Must mention both data and programs for two marks on storage</p> <ul style="list-style-type: none"> • more flexible use of equipment e.g. employees able to use any available computer • improved communications • e.g. internal email provides a record of communications,/ reduces the need to meet in real time as staff may frequently be out of the office etc. <p>Max 4</p> <p>(i)</p> <ul style="list-style-type: none"> • Difference in reach (1) LAN restricted to a single site/building/campus (1) WAN more than one site/geographically remote locations (1) • Difference in type of connection (1) LAN can be connected via direct link/physical link/co-axial cable/UTP/fibre optic cable/wireless/owned (1) WAN connection via satellite link, modem, telephone line/leased/shared (1) • Difference in speed of transmission of data (1) LAN high speed (10Mb, 100Mb etc) (1) WAN generally slower (1Mb typical broadband) (1) <p>Max 4</p>	

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	<p>(b) (i)</p> <ul style="list-style-type: none">• Difference in reach (1) LAN restricted to a single site/building/campus (1) WAN more than one site/geographically remote locations (1)• Difference in type of connection (1) LAN can be connected via direct link/physical link/co-axial cable/UTP/fibre optic cable/wireless/owned (1) WAN connection via satellite link, modem, telephone line/leased/shared (1)• Difference in speed of transmission of data (1) LAN high speed (10Mb, 100Mb etc) (1) WAN generally slower (1Mb typical broadband) (1) <p>Max 4</p> <p>(ii)</p> <p>Examples only accept any reasonable benefit</p> <ul style="list-style-type: none">• information on houses is up-to-date as obtained directly from relevant office• search capabilities become national as well as local• targeted, detailed information instantly available other offices <p>Max 2</p> <p>(c)</p> <p>Examples only accept any reasonable benefit</p> <ul style="list-style-type: none">• less ongoing costs as no need to develop film• instant check on quality/composition of picture• greater speed in obtaining the picture as no need to develop film/ picture can be input directly into the computer/no need to scan photograph• availability of short video clips <p>Max 2</p>	
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