



General Certificate of Education

Information and Communication Technology 5521

Unit 2 Information: Management and Manipulation

Mark Scheme

2007 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.

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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.

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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.

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Information: Management and Manipulation / Unit 2

1	<p>11.1 Data Capture</p> <p><i>When a picture is scanned the scanning software encodes the image, and the result is then stored for future use.</i></p> <p><i>Name two formats that can be used to store the encoded image.</i></p> <p>(One word answers are acceptable for this question.)</p>	(2 marks)
	<ul style="list-style-type: none"> • Bitmapped • Compressed bitmapped • Vector • Specific examples e.g. BMP, PIC, PCT, PCX, GIF, JPEG, TIF, WMF etc <p>ALLOW ANY TWO EXAMPLES OF TYPES OF ENCODING</p> <p>Max 2</p>	

2	<p>11.1 Data Capture</p> <p><i>Name a method of data capture, other than the use of a keyboard, that would be suitable for capturing the following data:</i></p> <p>(a) <i>marks from multiple choice examination answer sheets;</i></p> <p>(b) <i>details from bank cheques;</i></p> <p>(c) <i>details of library book loans and returns.</i></p>	(1 mark) (1 mark) (1 mark)
	<p>(a) Optical Mark Recognition</p> <p>(b) Magnetic Ink Character Recognition/Optical Character Recognition</p> <p>(c) Bar Code Recognition/Magnetic (stripe) Recognition/ Allow Biometric recognition for members</p> <p>Must be a method not a device</p> <p>BUT use of the word READER etc or initials OMR, MICR penalise once only</p> <p>Allow alternative methods e.g. reading/scanning/sensing</p>	

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3	<p><i>11.4 Software: Nature, Capabilities and Limitations</i></p> <p><i>An applications package has macro capabilities.</i></p> <p><i>Describe what is meant by the term macro, and give an example of where the use of a macro would be appropriate.</i></p>	<i>(4 marks)</i>
1	<ul style="list-style-type: none"> • A sequence of instructions • which are defined as a single element... • ..that performs a task • ..required on a regular basis • Provides ability to store/record/define a sequence of instructions • Actuated by a single instruction/key sequence/hot key/button/icon selection <p>Max 3</p> <ul style="list-style-type: none"> • any example of a sequence of commands that is likely to be required frequently or a sequence of commands to automate a task or a sequence of commands to provide a customised user environment. e.g. Print a selected area of a worksheet, Load a skeleton letter etc 	

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4	<p><i>11.4 Software: Nature, Capabilities and Limitations</i></p> <p><i>A large company that sells books over the Internet has decided to change the software it uses to process its customers' orders.</i></p> <p>(a) <i>Explain possible technical implications of changing the software.</i></p> <p>(b) <i>Explain possible human implications of changing the software.</i></p>	<p>(4 marks)</p> <p>(4 marks)</p>
	<p>(a)</p> <ul style="list-style-type: none"> • Hardware may need upgrading (1) e.g. (1) • Other software may need upgrading (1) e.g. (1) • May be incompatible with other hardware/software used (1) e.g. (1) • Data may need to be converted to new format (1) e.g. (1) • New software not tested properly (1) e.g. (1) <p>Allow extra mark for e.g. NB New software not set-up correctly allow for either (a) or (b) but not both Max 4</p> <p>(b)</p> <ul style="list-style-type: none"> • May need training • Unfamiliar with new features/need time to adjust to using new features • Initial use of new software can cause stress • takes time to change/check data on transfer//takes time to install • 'Old' procedures/keystrokes/menus may not still be available • Staff resistant to change • Staff could be made redundant/job could change <p><i>Allow candidates to answer by example</i> Max 4 NB New software not set-up correctly allow for either (a) or (b) but not both</p>	

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5	<p>11.8 Backup systems</p> <p><i>The ICT manager of a large hospital is reviewing the backup and recovery systems for patients' records.</i></p> <p>(a) <i>Describe four factors that the manager must consider when designing backup procedures for this system.</i></p> <p>(b) <i>State two factors that the manager must consider when designing recovery procedures for this system.</i></p>	<p>(8 marks)</p> <p>(2 marks)</p>
	<p>(a)</p> <ul style="list-style-type: none"> • Frequency of backup (1) consideration of what is suitable or not-suitable(1) • Timing of backup (1) consideration of what is suitable or not-suitable(1) • Responsibility for ensuring back up completed (1) according to agreed procedures/ e.g. staff responsible network manager, shift leader etc (1) • Backup media (1) consideration of what is suitable or not-suitable(1) • Location of backup (1) consideration of what is suitable or not-suitable(1) • Security of backup (1) consideration of what is suitable or not-suitable(1) • Type of backup (1) consideration of what is suitable or not-suitable(1) • Testing of backup (1) to ensure that the patients records can be recovered (1) <p>Any 4 × (2, 1, 0)</p> <p>(b)</p> <ul style="list-style-type: none"> • Testing of recovery plan • Availability of staff to recover • Training of staff to cope/staff know their rôle • Availability of equipment • Availability of software • Availability of alternative site • Availability of communication links <p>Max 2</p>	

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6	<p><i>11.10 Human/Computer Interface</i></p> <p><i>Most personal computers make use of a Graphical User Interface (GUI).</i></p> <p><i>State four features of a GUI, giving a benefit of using each feature.</i></p>	<i>(8 marks)</i>
	<ul style="list-style-type: none"> • Windows/dialogue boxes (1) plus benefit (1) • Icons (1) plus benefit (1) • Menus (1) plus benefit (1) • Pointers/mice (1) plus benefit (1) • Help (1) plus benefit (1) • Drag and drop (1) plus benefit (1) • Popups.....(1) plus benefit (1) • Toolbars (1) plus benefit (1) • Desktop (1) plus benefit (1) <p>NOT WIMP by itself Any 4 x (2, 1, 0)</p>	

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7	<p>11.2 Verification and Validation</p> <p><i>A company that sells toys by mail order uses data entry clerks to enter the order details into its ICT system. The data comes from order forms that have been received by post. The order details are always validated and may be verified.</i></p> <p><i>Some of the following details from the order forms are entered by the clerks, and others appear automatically, in the fields below.</i></p> <p style="text-align: center;"> <i>Title</i> <i>Surname</i> <i>HouseNumber/Name</i> <i>Postcode</i> <i>ToyCode</i> <i>ToyDescription</i> <i>ToyPrice</i> <i>Quantity</i> </p> <p>(a) <i>Describe what is meant by the terms verification and validation.</i> (3 marks)</p> <p>(b) <i>Explain how data entered into the field 'Quantity' could be validated.</i> (2 marks)</p> <p>(c) <i>Explain why data entered into the field 'Surname' should be verified.</i> (2 marks)</p> <p>(d) <i>Name two fields where a drop down list would be appropriate for the clerks to choose the data to be entered, and explain why.</i> (3 marks)</p> <p>(e) (i) <i>Name a field where data entered by the clerk could trigger the automatic entry of data into two other fields.</i> (1 mark)</p> <p style="padding-left: 20px;">(ii) <i>Name two fields where the data would then appear automatically.</i> (2 marks)</p> <p style="padding-left: 20px;">(iii) <i>Give two benefits of automatic data entry.</i> (2 marks)</p>	
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	<p>(a)</p> <p>Verification</p> <ul style="list-style-type: none"> • Checking by comparison that no alterations (allow mistakes) are made to data on entry into the computer system • Specific example e.g. keying data twice and comparing on input, checking contents of completed input screen with input document <p>Validation</p> <ul style="list-style-type: none"> • Checking that data is sensible (allow suitable alternative word)/rejecting data that is unreasonable • Specific example e.g. Presence check, Format check etc or description <p>Max 3</p> <p>(b)</p> <ul style="list-style-type: none"> • Can only take one form, must be numeric/ use of type check/ALLOW use of format check (1) explanation in context (1) • Must be present/use of presence check (1) explanation in context (1) •and within a specific range/use of range check (1) explanation in context (1) • Provide correct choices (1) explanation in context (1) <p>Max 2</p> <p>(c)</p> <ul style="list-style-type: none"> • Surnames may take many forms •so difficult to design suitable validation checks • Customers upset by misspelling etc/right person identifiable <p>Max 2</p> <p>(d)</p> <ul style="list-style-type: none"> • Title (1) Toy Code (1) Quantity (1) <p>Max 2</p> <ul style="list-style-type: none"> • Fixed number of correct choices (1) <p>1</p> <p>(e)</p> <p>(i) Trigger Toy Code/Postcode (1)</p> <p>(ii) Toy Description (1) Toy Price (1) // Address1 (1) Address2 (1)</p> <p>(iii)</p> <ul style="list-style-type: none"> • Fewer errors by data entry clerks • Data entry takes less time.... • E.g. Address chosen from list of correct addresses <p>Max 2</p>	
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8	<p>11.3 Organisation of data for effective retrieval</p> <p><i>A small company that makes items of furniture keeps records of its customers and their purchases in a relational database. At the end of a month, bills are sent to those customers that have been supplied with items of furniture. Examples from tables in the relational database are shown below.</i></p> <p>Customer Table</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="text-align: center;"><i>Company</i></th> <th style="text-align: center;"><i>Building</i></th> <th style="text-align: center;"><i>Town</i></th> <th style="text-align: center;"><i>Postcode</i></th> <th style="text-align: center;"><i>Account Number</i></th> </tr> </thead> <tbody> <tr> <td><i>Smith & Co</i></td> <td><i>9 High Street</i></td> <td><i>Rushworth</i></td> <td><i>RH1 2PV</i></td> <td><i>257</i></td> </tr> <tr> <td><i>Patel & Son</i></td> <td><i>19 Main Road</i></td> <td><i>Stainford</i></td> <td><i>SN1 5ST</i></td> <td><i>492</i></td> </tr> <tr> <td><i>MacKay Furniture</i></td> <td><i>6 Broad Street</i></td> <td><i>Gifford</i></td> <td><i>GD2 2XR</i></td> <td><i>645</i></td> </tr> </tbody> </table> <p>Transaction Table</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="text-align: center;"><i>Account Number</i></th> <th style="text-align: center;"><i>Date</i></th> <th style="text-align: center;"><i>Purchase</i></th> <th style="text-align: center;"><i>Amount</i></th> </tr> </thead> <tbody> <tr> <td><i>645</i></td> <td><i>16/4/2007</i></td> <td><i>Table</i></td> <td><i>£600.00</i></td> </tr> <tr> <td><i>492</i></td> <td><i>16/4/2007</i></td> <td><i>Coffee Table</i></td> <td><i>£250.00</i></td> </tr> <tr> <td><i>257</i></td> <td><i>17/4/2007</i></td> <td><i>4 Dining Chairs</i></td> <td><i>£600.00</i></td> </tr> <tr> <td><i>257</i></td> <td><i>20/4/2007</i></td> <td><i>Table</i></td> <td><i>£400.00</i></td> </tr> <tr> <td><i>645</i></td> <td><i>21/4/2007</i></td> <td><i>Rocking Chair</i></td> <td><i>£200.00</i></td> </tr> <tr> <td><i>257</i></td> <td><i>22/4/2007</i></td> <td><i>Sideboard</i></td> <td><i>£750.00</i></td> </tr> </tbody> </table> <p>(a) <i>Explain why it is more efficient to store the data in two tables rather than using a single table.</i> (2 marks)</p> <p>(b) <i>How is the data related between the tables?</i> (2 marks)</p> <p>(c) <i>The database management system's report generator uses the two tables to produce the monthly bills that are to be sent to customers.</i></p> <p style="text-align: center;"><i>Draw a draft design for a monthly bill, using the entries for Smith & Co to illustrate the layout and contents of the report.</i> (6 marks)</p>	<i>Company</i>	<i>Building</i>	<i>Town</i>	<i>Postcode</i>	<i>Account Number</i>	<i>Smith & Co</i>	<i>9 High Street</i>	<i>Rushworth</i>	<i>RH1 2PV</i>	<i>257</i>	<i>Patel & Son</i>	<i>19 Main Road</i>	<i>Stainford</i>	<i>SN1 5ST</i>	<i>492</i>	<i>MacKay Furniture</i>	<i>6 Broad Street</i>	<i>Gifford</i>	<i>GD2 2XR</i>	<i>645</i>	<i>Account Number</i>	<i>Date</i>	<i>Purchase</i>	<i>Amount</i>	<i>645</i>	<i>16/4/2007</i>	<i>Table</i>	<i>£600.00</i>	<i>492</i>	<i>16/4/2007</i>	<i>Coffee Table</i>	<i>£250.00</i>	<i>257</i>	<i>17/4/2007</i>	<i>4 Dining Chairs</i>	<i>£600.00</i>	<i>257</i>	<i>20/4/2007</i>	<i>Table</i>	<i>£400.00</i>	<i>645</i>	<i>21/4/2007</i>	<i>Rocking Chair</i>	<i>£200.00</i>	<i>257</i>	<i>22/4/2007</i>	<i>Sideboard</i>	<i>£750.00</i>	
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	<p>(a)</p> <ul style="list-style-type: none"> • Prevents (unnecessary) repetition/duplication/redundancy of data//reduction in storage requirement • Prevents inconsistency of data • Reduces time taken to input/alter data <p>Max 2</p> <p>(b)</p> <p>Account Number in both tables (1) set as primary key (1) then used as foreign key/ link field (1)</p> <p>Max 2</p> <p>(c)</p> <ul style="list-style-type: none"> • Customer Name and Customer Address (1) Customer Account number (1) all in one place (1) • Date of bill • Document title • Bill/Invoice number • Purchases set out as table (1) need all 3 including purchase, amount and date (1) • Correct total (theirs or £1750.00) • Name and address of company at top/bottom of bill • Terms of payment <p>Max 6</p> <p>Blank Bill or NOT a report Max 2</p>	
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