



## General Certificate of Education

# Information and Communication Technology

5521/6521

ICT4

## Mark Scheme

*2006 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.

## Unit 4 Information Systems within Organisations

**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	13.6 Explain what is meant by the term risk analysis.	(3 marks)
	any 3x1 <ul style="list-style-type: none"><li>• identify each element of an information system (1)</li><li>• place a value – to the business/organisation – on that element (1)</li><li>• identify any potential threats to that element (1)</li><li>• the likelihood of the threat occurring (1)</li><li>• put a value against each (1)</li><li>• calculate an overall Risk figure (1)</li><li>• make contingency/disaster recovery plan based on the result (1)</li></ul>	

<p><b>2</b></p>	<p>13.4 <i>One way of classifying information is by its source, examples of which are internal, external, primary or secondary.</i></p> <p><i>State <b>four</b> other ways of classifying information, giving an example of each classification stated.</i></p>	<p>(8 marks)</p>																
	<p>1 for classification, 1 for example to 4 x (2,1,0)</p> <table border="1" data-bbox="395 539 1217 853"> <thead> <tr> <th data-bbox="400 539 603 573">Ways</th> <th data-bbox="603 539 1217 573">Example</th> </tr> </thead> <tbody> <tr> <td data-bbox="400 573 603 645">Nature</td> <td data-bbox="603 573 1217 645">quantitative, qualitative, formal, informal, structured, unstructured</td> </tr> <tr> <td data-bbox="400 645 603 678">Time</td> <td data-bbox="603 645 1217 678">historical, current, future</td> </tr> <tr> <td data-bbox="400 678 603 712">Frequency</td> <td data-bbox="603 678 1217 712">real-time, hourly, daily, monthly</td> </tr> <tr> <td data-bbox="400 712 603 745">Use/purpose</td> <td data-bbox="603 712 1217 745">planning, control, decision</td> </tr> <tr> <td data-bbox="400 745 603 779">Form</td> <td data-bbox="603 745 1217 779">written, visual, aural, sensory</td> </tr> <tr> <td data-bbox="400 779 603 813">Type</td> <td data-bbox="603 779 1217 813">disaggregated, aggregated, sampled</td> </tr> <tr> <td data-bbox="400 813 603 853">Level</td> <td data-bbox="603 813 1217 853">operational, tactical, strategic</td> </tr> </tbody> </table> <p><b>NOT Source (given)</b></p>	Ways	Example	Nature	quantitative, qualitative, formal, informal, structured, unstructured	Time	historical, current, future	Frequency	real-time, hourly, daily, monthly	Use/purpose	planning, control, decision	Form	written, visual, aural, sensory	Type	disaggregated, aggregated, sampled	Level	operational, tactical, strategic	
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<p><b>3</b></p>	<p>13.2 <i>When developing ICT systems, project teams should follow a formal method.</i> 13.8</p> <p>a) Give <b>three</b> reasons for using a formal method.</p> <p>b) A good ICT team requires a team leader to lead it to success, for example by ensuring that everyone in the team keeps to the standards set, by following the formal method being used.</p> <p><i>Explain <b>three</b> other tasks that the team leader should perform to help the team achieve success.</i></p>	<p>(3 marks)</p> <p>(6 marks)</p>
	<p>(a) any 3 x 1</p> <ul style="list-style-type: none"> <li>• to have standards in use</li> <li>• to provide clear timescales/deadlines</li> <li>• to identify the agreed deliverables</li> <li>• to identify milestones, where approval to proceed can occur</li> <li>• to give clear tasks/objectives</li> <li>• to see who should be doing what, and when</li> <li>• to enable control/monitoring of the schedule or budget</li> </ul> <p>(b) 1 for task (t) and 1 for expansion/example (e) to any 3 x (2,1,0)</p> <ul style="list-style-type: none"> <li>• allocating the right task to the right team member (t) + e</li> <li>• controlling any changes requested (t) + e</li> <li>• controlling costs of the project (t) + e</li> <li>• ensuring everyone sticks to the timescales (t) + e</li> <li>• making sure that good communication is maintained (t) + e</li> <li>• keeping the management/users informed of team progress (t) + (e)</li> <li>• motivating the team/keeping up team morale (t) + (e)</li> </ul> <p><b>N.B. NOT “ensure standards used” - given</b></p>	

<b>4</b>	<p>13.5 <i>When an organisation introduces a new information system changes may occur that affect employees.</i></p> <p><i>State <b>four</b> changes that may occur and, for each one, explain a possible effect on employees of the organisation.</i></p>	<i>(8 marks)</i>														
	<p>1 for change (c), 1 for effect (e) to any 4 x (2,1,0)</p> <p><i>The table shows a list of changes and a list of effects – allow any effect to go with any change if it makes sense – but only allow an effect once. Also, only allow 1 internal procedure change mark</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Change (c)</th> <th style="text-align: left;">Effect (e)</th> </tr> </thead> <tbody> <tr> <td>the job may change</td> <td>may mean a need for re-training/re-skilling</td> </tr> <tr> <td>employment conditions may change (contract changes)</td> <td>may have to move house</td> </tr> <tr> <td>employment patterns may change</td> <td>May mean working shifts round the clock</td> </tr> <tr> <td>internal procedures may change (or example **)</td> <td>may mean interfacing with unfamiliar people</td> </tr> <tr> <td>change in structure (job losses, delayering, or job gains)</td> <td>may mean job losses/ fear of redundancy</td> </tr> <tr> <td>changes in management</td> <td>may mean different communication methods</td> </tr> </tbody> </table> <p>** Examples of internal procedures –</p> <ul style="list-style-type: none"> <li>• Security procedure changes</li> <li>• Data processing/handling routes change</li> <li>• Communication paths</li> <li>• Staff vetting</li> </ul>	Change (c)	Effect (e)	the job may change	may mean a need for re-training/re-skilling	employment conditions may change (contract changes)	may have to move house	employment patterns may change	May mean working shifts round the clock	internal procedures may change (or example **)	may mean interfacing with unfamiliar people	change in structure (job losses, delayering, or job gains)	may mean job losses/ fear of redundancy	changes in management	may mean different communication methods	
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<p><b>5</b></p>	<p>13.9 <i>An organisation has recently produced a new code of practice for its</i>  13.6 <i>ICT users. All such users must sign to say they will abide by its contents.</i></p> <p>a) <i>State <b>four</b> topics that should be covered in an ICT code of practice.</i></p> <p>b) <i>The organisation wants to inform all its staff that they need to sign this new code of practice within the next three weeks.</i></p> <p><i>Give <b>four</b> methods by which the organisations could inform all the staff and, for each one, state how it would be effective.</i></p>	<p>(4 marks)</p> <p>(8 marks)</p>
	<p>(a) Any 4 x 1</p> <ul style="list-style-type: none"> <li>• use of company software/not breaching copyright/licences</li> <li>• use of company hardware/not bringing in floppy disks/introducing viruses etc</li> <li>• use of data</li> <li>• correct use of time/not sending personal emails</li> <li>• use of the internet or intranet/not going on “unsuitable” sites</li> <li>• authorisation paths/levels, access rights/job related</li> <li>• security, password/ids/physical aspects/protecting passwords</li> <li>• penalties for misuse/disciplinary procedures</li> <li>• company’s implementation of legislation (as a general point)</li> </ul> <p>(b) 1 for method (m), 1 for effectiveness (e) to 4 x (2,1,0)</p> <ul style="list-style-type: none"> <li>• Staff meeting/one-to-one/Education of staff (m) + (e)</li> <li>• Memo/Newsletter/Pamphlet (m) + (e)</li> <li>• Intranet/central information store (m) + (e)</li> <li>• E-mail to all staff (m) + (e)</li> <li>• Send in the post to all staff (m) + (e)</li> <li>• Posters (on noticeboards/wall) (m) + (e)</li> <li>• Bulletin Boards (electronic noticeboards) (m) + (e)</li> <li>• Phone/Text messaging (m) + (e)</li> <li>• Startup message on company network (m) + (e)</li> </ul> <p><b>N.B. Do not allow same effectiveness twice</b></p>	

<p><b>6</b></p>	<p><b>13.4</b></p> <p><i>An ice-cream manufacturer is considering introducing frozen yoghurts to its product range. A market research company is to find out if there is a market for the product by asking a sample of people in city centres the same set of questions.</i></p> <p><i>A paper questionnaire, like the example in Figure 1, will be filled out with the responses given by each person. Some responses are written as a cross in a box, or as a circle around a number or letter. Other responses will be written down as free text, recording the comments made by the interviewees.</i></p> <p><i>The responses recorded on the questionnaires will be processed by an ICT system, and summary information will be produced for the ice-cream manufacturer.</i></p>	
	<p><i>(a) For the free text responses:</i></p> <p><i>(i) suggest a suitable data capture method;</i></p> <p><i>(ii) describe a suitable method for trying to ensure accurate data entry.</i></p> <p><i>(b) For the crossed or circled responses:</i></p> <p><i>(i) suggest a different data capture method that would be suitable for these responses;</i></p> <p><i>(ii) describe a suitable method for trying to ensure accurate data entry.</i></p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <i>For the information that will be presented to the ice-cream manufacturer, suggest and justify a suitable output format for:</i></p> <p><i>(i) summarising the free text responses;</i></p> <p><i>(ii) summarising the crossed and circled responses;</i></p> <p><i>(d) Explain why the market research company has chosen to use an ICT system to process the responses.</i></p>	<p><i>(1 mark)</i></p> <p><i>(2 marks)</i></p> <p><i>(1 mark)</i></p> <p><i>(2 marks)</i></p> <p><i>(2 marks)</i></p> <p><i>(2 marks)</i></p> <p><i>(2 marks)</i></p>

	<p>(a)</p> <p><b>Free Text</b></p> <p>i. Any 1 from list</p> <ul style="list-style-type: none"> <li>• Keyboard entry/Keying/Typing</li> <li>• Optical Character Recognition</li> <li>• Voice Recognition</li> </ul> <p>ii. Any 1 x (2,1,0)</p> <ul style="list-style-type: none"> <li>• Double-entry verification (1), where a second person overtypes the first entry(1);</li> <li>• Sight/spell verification (1) to check OCR has correctly translated the input text (1)</li> <li>• Sight verification (1) check back with original document (1)</li> </ul> <p>(b)</p> <p><b>Coded</b></p> <p>i. Any 1 from list</p> <ul style="list-style-type: none"> <li>• Optical Mark Recognition</li> <li>• Optical character recognition (if not used in (a) i)</li> <li>• Mouse-click</li> </ul> <p>ii. Any 1 x (2,1,0)</p> <ul style="list-style-type: none"> <li>• Validation (1), to prevent out of range answers being entered (1);</li> <li>• Verification by sight(1), to check the OMR reader has read the pages properly (1)</li> </ul> <p>(c)</p> <p>(i) <i>1 mark for format, 1 mark for justification</i>          Précis of comments/report with management summary (1), most frequent comments highlighted/because management do not need to see every detail (1)</p> <p>(ii) <i>1 mark for format, 1 mark for justification</i>          Graphs/charts/numerical summary (1), easy to see bulky results (1)</p> <p>(d) <i>1 mark for reason, 1 for contextualising the answer (2<sup>nd</sup> mark is for explaining why this company is using ICT for this survey)</i></p> <ul style="list-style-type: none"> <li>• process large number</li> <li>• results received faster</li> <li>• displayed suitably/easier to read</li> <li>• reduce errors/better accuracy</li> <li>• could combine with other internal or external data</li> </ul>	
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<p>7</p>	<p>13.6 <i>Information System Security Policies cover issues to do with the secure use of information systems, as well as issues surrounding the security of the data held within them.</i></p> <p>(a) <i>A typical Information System Security Policy includes the procedures needed to protect the systems and data.</i></p> <p><i>Give <b>three</b> procedures, explaining how each one is used to protect systems and data.</i></p> <p>(b) <i>Name <b>two</b> pieces of legislation that should be considered when writing an Information System Security Policy</i></p> <p>(c) <i>State <b>four</b> factors that should be considered when writing an Information System Security Policy.</i></p>	<p>(6 marks)</p> <p>(2 marks)</p> <p>(4 marks)</p>
	<p>(a) 1 for procedure (p), 1 for expansion/example (e) to 3x(2,1,0)</p> <ul style="list-style-type: none"> <li>• User Ids &amp; Passwords – keeping safe (p), + e</li> <li>• Having access levels for staff (p) + e</li> <li>• Logging off computers when not in use (p) + e</li> <li>• Having a backup and recovery plan (p) + (e)</li> <li>• Having anti-virus software that automatically runs (p) + (e)</li> <li>• Having a firewall (p) + (e)</li> <li>• Encrypting data or emails being sent (p) + (e)</li> <li>• Physical security (e.g. swipe cards/door locks) (p) + (e)</li> <li>• Education &amp; awareness of staff (p) + (e)</li> </ul> <p>(b) any 2 x 1</p> <ul style="list-style-type: none"> <li>• Data Protection Act</li> <li>• Computer Misuse Act</li> <li>• Freedom of Information Act</li> </ul> <p>(c).any 4 x 1</p> <ul style="list-style-type: none"> <li>• Prevention of misuse</li> <li>• Detection of misuse</li> <li>• Investigation of misuse</li> <li>• Staff responsibilities</li> <li>• Disciplinary procedures</li> </ul>	

<p><b>8</b></p>	<p>13.2</p> <p>(a) <i>Using an example, explain what is meant by a data processing system.</i></p> <p>(b) <i>Using an example, explain what is meant by an information system.</i></p>	<p>(3 marks)</p> <p>(3 marks)</p>
	<p>(a) Data processing system – 2 for definition, 1 for example any 2 of:</p> <ul style="list-style-type: none"> <li>• Operational or low level system/electronic data capture(1) ;</li> <li>• used for repetitive/routine business activities (1);</li> <li>• day-to-day transactions/transaction processing. (1)</li> </ul> <p>Examples: Register/attendance, Application entry, Point-of-sale, Stock control, ticket booking system etc</p> <p>(b) Information system – 2 for definition, 1 for example any 2 of:</p> <ul style="list-style-type: none"> <li>• a system that takes data from different sources</li> <li>• and converts it into information</li> <li>• which can be communicated in appropriate format</li> <li>• to managers at different/tactical/strategic levels</li> <li>• to aid planning or decision-making</li> </ul> <p>Examples: Student Info system, Financial reporting system, Sales Information system, library information system, Management Information System, Executive information system, Decision support system etc</p> <p><b>N.B. “Using an example” means that a description of the relevant system can be used to help define either DPS or IS, as well as for the example mark – e.g. a description of scanning barcodes can be credited for “electronic data capture”</b></p>	

<p><b>9</b></p>	<p>13.3 <i>A long-standing national chain of shoe shops has built up its information systems one at a time, and without an overall plan. It is now having difficulty in getting these systems to work together effectively and has therefore decided to create a Corporate Information Systems Strategy.</i></p> <p><i>Discuss the influence of the following factors when planning a Corporate Information Systems Strategy:</i></p> <ul style="list-style-type: none"> <li>• <i>the structure of the organisation;</i></li> <li>• <i>information flow around the organisation;</i></li> <li>• <i>personnel in the organisation.</i></li> </ul> <p><i>The Quality of Written Communication will be assessed in your answer.</i></p>	<p>(20 marks)</p>
	<p>Continuous prose is expected for this answer. <i>Discuss</i> is the question, so each point made must be full, not just a single word/phrase. Mark as <b>O</b>, <b>F</b> or <b>P</b> for three bullets. A full explanation/description gets an extension mark (<b>Oe</b>, <b>Fe</b> or <b>Pe</b>) – <i>no more than 6 marks awarded in each section – to a maximum of 16 content marks.</i></p> <p><b>O</b> – organisation structure</p> <ul style="list-style-type: none"> <li>• Organisational shape (hierarchical, flat etc)</li> <li>• Functions in the organisation</li> <li>• Organisational size (single site/national/international)</li> <li>• Centralised/Distributed management</li> <li>• Levels of personnel or task</li> <li>• Different levels need different tasks</li> <li>• Business objectives</li> </ul> <p><b>F</b> – information flow –</p> <ul style="list-style-type: none"> <li>• Formal methods</li> <li>• Informal methods</li> <li>• Planning and decision making methods</li> <li>• Examples of information flow</li> <li>• Effects of legislation on flow</li> </ul> <p><b>P</b> – people</p> <ul style="list-style-type: none"> <li>• Behavioural factors</li> <li>• Attitudes/personalities</li> <li>• Motivation/leaders</li> <li>• Working in teams</li> <li>• Ability to adapt to change</li> <li>• Skills of staff (Training needs)</li> <li>• Levels of personnel (can be given here as an alternative to O)</li> </ul>	

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