GCE 2005
January Series

ASSESSMENT and QUALIFICATIONS ALLIANCE

Mark Scheme

Information and Communication Technology
ICT 4

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 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. 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

10. 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.

11. The only figures in the margin should be sub-totals for parts of questions and a final ringed total for a whole question.

12. 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.

13. 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.

14. 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.

15. All zero values should be crossed through.

16. All blank spaces should be crossed through with a vertical line through the text space – not in the margin.

17. All writing must be marked as read, either by the presence of ticks or by striking through the script with a vertical line.

18. All blank pages must be crossed through.

19. 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.

20. The use of the following symbols/marks 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.

21. **NO** other symbols or comments should be used.

22. 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 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	*13.2*	***Definition of an MIS*** *Management Information Systems (MIS) are used by managers at different levels in an organisation.*	
	(a)	*What is an MIS?*	*(2)*
	(b)	*Using an example, state how a high-level manager, such as a Managing Director, could use an MIS.*	*(2)*
	(a)	any 2 x1 • a system to **convert data from internal and external sources** into information (1) • communicated in an **appropriate/understandable form** (1) • for use by **managers at different levels** (1) • to **use the information** produced (1) • to enable them to make effective **decisions** (1)	
	(b)	For example – • A supermarket CEO may take a report showing the comparative performance of all the supermarkets in the country (1) to decide the long-term strategy/make strategic decisions (1) • An MD could use an MIS to analyse financial information, such as the income of a supermarket, (1) to see whether the store is making money or not, thus aiding the decision to keep the store open. (1) – *Must have a suitable strategic example for 1st mark* – *Need the idea that higher management working at **strategic** level for 2nd mark (or an extension of the example)* – *Be careful not to credit as strategic any short term/single item type of example.*	

2	*13.3*	***Corporate Information Systems Strategy*** *Describe **three** factors that can influence an information system within an organisation that should be considered when writing a Corporate Information Systems Strategy.*	*(6)*
		1 for stating factor (**f**), 1 for description/example/expansion (**e**) to max 3 x (2,1,0) **NOT DEPENDENT MARKS** • Business strategy/Business objectives (f) + (e) • Legal and Audit requirements (f) + (e) • Information flow within the organisation (f) + (e) • Staff knowledge and experience with ICT (f), + (e) • Management style and methods/culture (f), + (e) • General organisational structure (f) + (e) • Breakdown of functions (f), + (e) • Responsibilities for ICT (f), + (e) • Personalities within org (f), + (e) • Ability to adapt to change (f), + (e) • Motivation of staff (f), + (e) • Training facilities for staff (f), + (e) • Hardware/technology available/considerations (f) + (e) • Software/applications/systems available/considerations (f) + (e) • Standards in use within organisation/within the industry (f) + (e) • Behavioural factors (f) + (e)	

3	*13.2*	***Success or failure of an MIS*** *Failure of a Management Information System (MIS) can sometimes be caused by a lack of communication between management, users and the development team.* *Give **three** factors, other than lack of communication, that might cause an MIS to fail.*	*(3)*
		1 per factor. Any 3 x 1 • inadequate analysis/other phase • emphasis on computer system/ not on info needs of users • concentration on low level data processing • not giving managers what they need/not meeting requirements • lack of management knowledge of ICT and its capabilities • lack of team work • lack of standards • Incomplete documentation • problems with changeover/procedures not ready • staff not prepared/ change in roles/ training not taken place etc • lack of consideration for post-implementation maintenance • excessive management demands *Make sure **NOT** to give any marks for management/user involvement or consultation (lack of communication in the stem)*	

4	*13.9*	***Information and the professional***	
	(a)	*Explain what is meant by an IT Code of Practice.*	*(3)*
	(b)	*Responsibilities of the employees when using the company's hardware is one topic usually included in a code of practice.* *Describe **two** other topics that should be included in a code of practice.*	*(4)*
	(a)	Any 3 of : • **A set of rules/regulations** which governs the use of ICT systems (1) ***NOT** guidelines* • Established by an organisation (1) • For all employees/users to follow (1) • May refer to the responsibilities of employees (1) • Penalties for misdemeanours (1) • Separate from any legal or ethical considerations (1)	
	(b)	1 for topic (**t**), plus description/example/expansion (**e**)– any 2 x (2,1,0) *these are non-dependant marks – can get the example mark without the topic mark.* • use of software (t) e.g. not breaching copyright or abusing licence agreements/rules on the use of specific software (e) • use of data (t) e.g. making sure you don't allow anyone else access to the data that you are allowed to see (e) • correct use of time (t) e.g. not sending personal emails (e) • use of the internet or intranet (t) e.g. not going on "unsuitable" sites (e) • authorisation paths/levels, (t) e.g. having access rights that are job related (e) • security, (t) e.g. use of password/ids/physical aspects (e) • company's implementation of legislation (t) e.g. DPA, H&S, etc (e) • penalties for misdemeanours/disciplinary procedures* (t) e.g. warnings/ sanctions/dismissal (e) ** if not already given in part (a) (though can still get the (e) mark)* *Remember not to credit "use of hardware" (in the question)*	

<table>
<tr><td>5</td><td>13.7</td><td>User support and training</td><td></td></tr>
<tr><td></td><td>(a)</td><td>Describe three ways in which training may be provided for users of ICT systems.</td><td>(6)</td></tr>
<tr><td></td><td>(b)</td><td>Describe three ways in which support may be provided for users of ICT systems.</td><td>(6)</td></tr>
<tr><td></td><td>(a)</td><td>1 for way (w), 1 for description/example/expansion (e). Any 3 x (2,1,0)
marks are independent

• On-line tutorials/internet (w), + (e)
• Step through guide/user training manual (NOT text-book) (w), + (e)
• Training course (internal or external) (w) + (e)
• CBT using a CD-Rom or Software or DVD-Rom (w), + (e)
• Video using VHS or DVD or CD (w) + (e)
• One-to-one/on-the-job training (w), +(e)

For example:
Computer based training (w), where you sit in front of a computer following demonstrations and then completing exercises (e).</td><td></td></tr>
<tr><td></td><td>(b)</td><td>1 for way (w), 1 for description/example/expansion (e) – max. 3 x (2,1,0)
marks are independent

<table>
<tr><th>WAY (w)</th><th>Description/example/expansion (e)
These are examples only – other expansions are equally valid</th></tr>
<tr><td>(External) Phone line/Help desk</td><td>someone technical to guide/help / supplier service</td></tr>
<tr><td>On-site support technician / Help desk</td><td>to be on-hand</td></tr>
<tr><td>User guides/ articles/ utilities/ books/ documentation</td><td>people can work at own pace/ have instructions at side/ look it up for themselves</td></tr>
<tr><td>Communications systems/ bulletin boards/ internet site/ intranet (passive)</td><td>more able users can help themselves by reading the information</td></tr>
<tr><td>On-line technical help (active)</td><td>Get specific queries solved by a technical expert/via email</td></tr>
<tr><td>Email updates</td><td>Subscribe to service/arrives automatically</td></tr>
<tr><td>On-screen help</td><td>installed with package/ wizards to help solve problems</td></tr>
<tr><td>Call-out support</td><td>Suppliers may guarantee response times</td></tr>
</table></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>

6	*13.4*	***Information*** *When buying at an on-line store on the Internet, customers access the stock control and ordering systems of the company from which they are buying.*	
	(a)	*Within this context and using an example for each one, describe **three** characteristics of good information.*	*(6)*
	(b)	*Good information is vital to both the company and its customers.* *(i) State **two** benefits to customers of the company using good information.* *(ii) State **two** benefits to the company of having good information*	*(2)* *(2)*
	(a)	1 for characteristic/description (**c**), 1 for example (**e**). Any 3 x (2,1,0) • Relevant or description (c) + example (e) • Accurate or description (c) + example (e) • Complete or description (c) + example (e) • Reliable/have User's confidence or description (c) + example (e) • Right person/level or description (c) + example (e) • Right time or description (c) + example (e) • Right detail/Concise or description (c) + example (e) • Correct channel of communication or description (c) + example (e) • Understandable or description (c) + example (e) • Up-to-date or description (c) + example (e) • In right format or description (c) + example (e) **NOT** - Brief *- use notation **'ooc'** if a valid example (for the characteristic) is given but is not in the on-line store context. Do not give a mark for an out-of-context example.*	
	(b) (i)	2 points made that are valid – examples: • means that the customer knows that what they have ordered is available • will be delivered when the on-line store says it will • the price quoted is accurate • customer has confidence	
	(ii)	2 points made that are valid – examples: • means that the organisation will have the stock • capability to satisfy customer buying requirements • will not be duped by fraudulent transactions • will be competitive with similar on-line selling organisations • customer satisfaction/so will use the site again • can use the statistics/info to make company decisions • increased business/profits	

7	*13.6*	***Legislation***	
	(a)	*A college has purchased a multi-media package with a licence agreement that allows up to 40 users at any one time. The college network has over 200 machines for student use.* *Describe **one** way of installing this package to ensure that the college does not break this licence agreement,*	*(2)*
	(b)	*Describe **two** other actions that the college could take to control the installation of unauthorised software on the college network.*	*(4)*
	(a)	Either of these - • Installing the software directly onto 40 computers (1), so that no more copies are available (1) • Installing the software onto a network server (1) and using software controls to limit the usage (1)	

	(b)	1 for Action (a), 1 for description/example/expansion (e) to any 2 x (2,1,0)
		
		• Regular audits/monitoring (a) of software on all computers/network (e)
		• Establish levels of access (a) so only authorised people can install software (e)
		• Appoint a software/network manager (a) who is responsible for all software licensing matters (e)
		• Monitoring of internet usage(a) checking for illegal downloading (e)
		• Code of practice for college network users (a) then any 1 of
		  ○ Not allowed to install unauthorised/unlicensed software
		  ○ Not allowed to copy software for home/unlicensed use
		  ○ Disciplinary Procedures (e)
		• Virus scanning (a) of any externally used disk (e)/Disabling floppy/CD/USB drives (a) so users cannot load unauthorised software (e)
		• Reinstall all software when each computer is rebooted (a) so that any illegally installed software is 'erased' (e)	

8	*13.4*	***Data*** *A local authority has sent out a questionnaire to every household to identify their leisure requirements. The answers will be processed by a Management Information System and the results presented to managers.*	
	(a)	*Some answers are given numeric codes; other answers are in free text.* *Give **two** problems that might occur when entering the free text answers.*	*(2)*
	(b)	*Name **three** data capture methods that the local authority could use for entering the data collected on the questionnaires, and state why each is suitable.*	*(6)*
	(c)	*Describe an effective method of presenting the information produced.*	*(2)*
	(a)	Any 2 of • Translation problems e.g. illegible writing (1) *(i.e. reading difficulties)* • Transcription problems (1) *(i.e. keying difficulties)* • Verification (1) • Difficulty understanding the responses (1) • Irrelevant answers • Too wide a range of answers	
	(b)	1 for method (m), 1 for suitability/example (e) to any 3 x (2,1,0) • Optical Mark Recognition • Keyboard Entry/ key-to-disk • Optical Character Recognition/scanning into a word processing program • Pointer (Mouse acceptable) for Radio button/check box • Touch Screen • Voice Input • Bar code scanning/recognition *(needs to be for form identification, not numeric codes)*	
	(c)	Any 1 x (2,1,0) • OHP/Presentation (1) plus description/example/expansion (1) • Report (1) plus description/example/expansion (1) • (Series of) graphs/charts (*NOT a single graph/chart)* *Example –* 'Using reports which summarise the largest number of opinions. These reports could include illustrative presentation, such as graphs and charts.'	

9	*13.6*	***Disaster Recovery Management*** *A medical practice, in an area prone to flooding, has carried out a risk analysis and is now preparing its disaster recovery plan. The main elements of its ICT system are the patient records and prescription systems, and the network used to access and maintain them.*	
	(a)	*Explain what is meant by risk analysis.*	*(3)*
	(b)	*State **two** different potential threats to **this** ICT system, and describe a counter-measure for each one.*	*(6)*
	(c)	*Name **three** criteria that the medical practice should consider when choosing a suitable disaster recovery plan.*	*(3)*
	(a)	Any 3x1 • To identify each element of a successful information system (1) • place a value – to the business – on that element (1) • identify any potential threats to that element (1) • the likelihood of the threat occurring (1) • use an algorithm to calculate an overall risk figure (1) • that will indicate a degree of severity (1)	
	(b)	1 for threat(**t**), 1 for counter-measure(**c**), 1 for description of why/how it would counteract the threat(**e**). Any 2x (3,2,1,0) *Candidate does not need to have the threat to get the other two marks;* *however, if a valid threat is offered, then no credit to non-matching* *countermeasure and expansion.* *Two countermeasures for one threat can gain both (c) and (e) marks*	

	Threat	**Counter measure** *(examples)*	**Example/expansion** *(examples)*
	Natural disaster– e.g. flood, earthquake	backup kept off-site; hardware kept above flood-line;	so that a safe copy is held and system can be reloaded;
	Electrical surge/power loss	UPS/ RAID/ off-site duplication/ Mirror	as above
	Physical – e.g. theft	use locks etc	prevent easy entry
	Personnel – e.g. accidental overwrite	have procedures	trained staff less likely to make mistakes
	Hardware – e.g. disk crash	have duplicate system/ hot site arrangment	so that system can be up and running a.s.a.p

	Communications breach – e.g. hacking in		firewalls, encryption, passwords	to lessen ability to see/steal/tamper with data
	Virus – e.g. Trojan		anti-virus software	to stop files getting infected
	Data errors, inaccurate data in system		verification and validation	pick up data errors before they get into the system
	(c)	Any 3 x 1 • Scale of the organisation and its ICT systems/Volume of data/Size of the system • Nature of the operation / The importance of data held • Timescale until the system is up and running • Costs of recovery options relative to "value" of systems • Perceived **likelihood** of disaster happening, based on risk analysis ***NOT**: Any of the contents of the recovery plan (eg how to set up, reciprocal site, who does what or anything to do with back-ups)*	

10	*13.2* *13.8*	***SDLC & Project Management and ICT teams*** *When an organisation develops a large information system several teams may be used.* *Discuss how ICT development projects should be organised to ensure successful outcomes, paying particular attention to the following topics:* • *the use and organisation of ICT teams;* • *the characteristics of successful ICT teams;* • *the use of formal methods for the development of information systems.* *The quality of written communication will be assessed in your answer*	*(20)*
		Continuous prose is expected for this answer. *Discuss* is the question, so each point made must be full, not just a single word/phrase. Mark as **O, C** or **M** for three bullets. A full explanation/description gets an extension mark (**Oe, Ce** or **Me**) – *no more than 6 marks awarded in each section* *Notes:* *1. only 1 mark for a list of items/topics* *2. expansions below are examples only – others are valid*	
		O – organisation and use of ICT teams – • Projects sub-divided into tasks (and allocated to teams) (o) • Small 4-6 people teams making up a full project team (o), so that the number of people for the team leader to control does not become unmanageable (oe) • Each team one specialism (e.g. testers, designers) (o), often a mixture of trainees through to highly experienced specialists/ allows development of less experienced team members (oe) • Or each team analysis to design of one functional area (o) so that there is a feeling of achievement when the function is completed (oe) • Each team own team leader (o) reporting to Project manager (oe) • Each team own plan (o) with own set of tasks (oe) • Teams can work in parallel (o) to lessen elapsed(overall) time/bring deadline forward (oe)	

		C – characteristics of ICT teams – • Leadership; seniority to task (c) understanding, ability to hold team together/control team (ce) • Balance of team members (c) business/system/operational/technical (ce). • Appropriate allocation to task (c) play to strengths of team member, viewing "whole" (ce) • Adherence to agreed standards (c) using agreed design methodology or procedures (e.g. ISO9000/2000, CMM) (ce) • Skills to monitor and control (c) progress against plan/ keeping to deadlines /recording progress etc (ce) • Skills to adequately and systematically monitor and control costs (c) • Good communication skills; with end users/company management (c) • Good internal/within team communication skills (c)	
		M – use of formal Methods for development of IS • Systems development life cycle (m) plus description/expansion of stages (me) *(only 1 expansion mark even if all stages are well described)* • Structured methods (m) plus example (spiral, dsdm, ssadm etc) (me) • Prototyping (m) to show users quicly what the system could be (me) • Clear timescales (m) so that milestones are set/agreed / project will finish on time (me) • Agreed deliverables (m) e.g. system documentation, tested programs etc/ so that user knows what they are getting (me) • Approval to proceed (m) when users sign-off/ at end of stage (me) • Project/stage review meetings (m) with system commissioners/to get sign-off (me) • Team/progress meetings (m) internal – against project plan at task level (me)	

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