AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

General Certificate of Education

Information and Communication Technology 6521

ICT 5 Information: Policy, Strategy and Systems

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 5: Information: Policy, Strategy and Systems

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	*Give **four** resources that could be charged for by using network accounting software.*	*(4 marks)*
	Any 4: - Duration of login / processor time (1) - storage (not RAM) (1) - printers/ ink/ toner/ paper (1) - Other peripherals (1) - APPLICATIONS software / example (1) - application software licenses (1) - what files accessed (1) - data throughput (1) - what web pages accessed (1) - e-mail (1) <div align=right>Max 4 x 1</div>	*4 marks*

2	*An ICT manager has chosen some alternative software solutions for evaluation.* *Name and explain **three** criteria that might be used in the evaluation.*	*(6 marks)*
	Credit any reasonable explanation **criterion (1) explanation/expansion (1)** - functionality (1) user requirements match user needs (1) - performance (1) use of benchmarks/processing/printing speeds (1) - usability (1) HCI issues/training (1) - compatibility *with* existing software base (1) backwards compatible with legacy components(1) - transferability of data (1) to legacy components/standards(1) - robustness (1) in use with competitors/testing issues(1) - user support (1) documentation/fault handling/training (1) - resource requirements (1) hardware/software/human(1) - upgradability (1) version release strategy(1) - financial issues (1) development cost/development opportunities. (1) - portability of software (1) across platforms(1) - compatibility *with* hardware (1) can old hardware be retained?(1) <div align=right>**Max 3 x (2 1, 0)**</div>	*6 marks*

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.

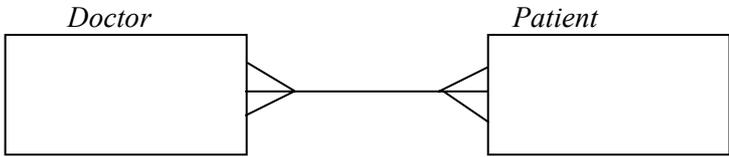| **3**	(a) Organisations make use of the Internet for many activities.
	
	State **three** such legitimate activities.
	
	(b) The World Wide Web is supported by a network infrastructure. This consists of a number of components.
	
	   (i) Describe the role of a router.
	   (ii) Describe the role of a web server.
		(3 marks)
		
		(2 marks)
		(2 marks)

	(a)
	any three:
	• e-mail (1)
	• selling products/services (1)
	• ordering / purchasing (1)
	• marketing/advertising products/services (1)
	• training / support (1)
	• recruitment (1)
	• banking (1)
	• information publication (1)
	• VLE (1)
	• information acquisition (1)
	• video conferencing (1)
	• voice over IP (1)
	• remote backup (1)
	                                  Max 3 x 1
	
	(b)
	(i)
	any two:
	
	• acts as a gateway / connects networks (1)
	• that maintains a table of available routes (1)
	• that reads the destination address (1)
	• that determines where to forward packets/data (1)
	                                  Max 2 x 1
	
	(ii)
	any two:
	
	• serves files/ services http requests (1)
	• to a web user/browser (1)
	• that builds web pages (1)
	• hosts web sites (1)
	• content filtering (1)
	• restricts access (1)
	                                  Max 2 x 1
		3 marks
		
		2 marks
		
		2 marks

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.

4	*There are a number of different ways by which an organisation may obtain a software solution.*	
	Explain **one** *benefit to an organisation of:*	
	(a) purchasing an 'off-the-shelf' package.	*(2 marks)*
	(b) leasing software under a licence.	*(2 marks)*
	(c) using an in-house development team to create a bespoke solution.	*(2 marks)*
	(d) using an external software house to create a bespoke solution.	*(2 marks)*
	For all a-d: **Do not allow cheap/cost on its own.** **Must be cheaper <u>than</u> for first mark and relevant expansion for second mark.** **Example answers.** **CREDIT ANY REASONABLE RESPONSES** **To max 4 x 2 marks** **simple statement (1) explanation/expansion (1)** **(a) 'off-the-shelf' packages:** immediately available (1) as produced for mass market(1) **(2,1,0) marks** **(b) leasing licences:** cheaper than purchasing software (1) so may be able to have more copies available for use (1) **(2,1,0) marks** **(c) in-house bespoke solutions:** support readily available (1) as development team are already part of company (1) **(2,1,0) marks** **(d) external software house bespoke solutions:** contract is in place (1) so there can be clauses to do with late delivery (1) **(2,1,0) marks** **Max 4 x (2 , 1, 0)**	*8 marks*

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.

5	*A software house sells an Operating System (OS) for PCs.* *(a) Although alpha and beta tested before release to the general public, the OS sometimes fails to function correctly.* *Give **three** reasons why this may happen.*	*(3 marks)*
	(b) From time to time during the life of the OS, the software house distributes maintenance releases. *Describe **two** reasons why the maintenance releases may be necessary.*	*(4 marks)*
	(a) Any 3: • Difficult to make alpha tests complete (1) • Software house cannot know all users' experiences on beta tests (1) • Testing Software is complex (1) • May receive unexpected uses (1) • May be in new software environment (1) • May be in new hardware environment (1) **Max 3 x 1** **(b)** **Example answers. Credit any reasonable response.** **(Any (2, 1, 0) from any row) x 2:**	*3 marks*

to fix errors (1)	system does not behave as expected when large files are opened / corrective maintenance (1)
to deal with changes affecting the software (1)	protect against new security threats / adaptive maintenance (1)
to add extra functions (1)	wizard for handling mobile phone connections / perfective maintenance (1)
	Max 2 x (2, 1, 0)

4 marks

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.
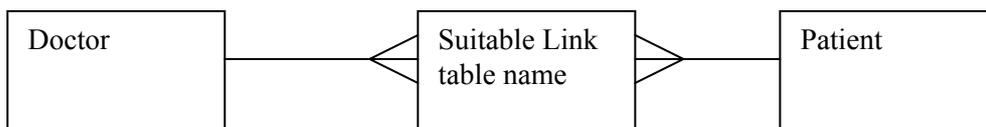
6	*College staff can obtain the A Level specifications for their subjects from the AQA website. These are provided as Portable Document Format (PDF) files.*	
	*(a) Give **three** possible reasons why PDF has been selected as the format in which to provide these files.*	*(3 marks)*
	(b) The AQA website has an Internet Protocol (IP) address, which has the form: nn.nnn.nnn.nnn .	
	Explain the role of IP addresses in the functioning of the Internet.	*(2 marks)*
	(c) College staff do not need to know the IP address of the AQA website, as they can use the Uniform Resource Locator (URL) instead – http://www.aqa.org.uk .	
	*Explain **two** benefits to the college staff of using the URL.*	*(4 marks)*
	(a) The following answers are examples only. Allow one mark for any point that relates to why the exam board have chosen PDF. Any 3: • standard for document sharing on the web (1) • exam board cannot guarantee the system type that viewers will have (1) • software to read the document is freely available (1) • formatting is retained… (1) • …e.g. logos/ forms/ fonts (1) • content can be copied and pasted into other applications (1) • content of this document format is easily accessible but harder to change (1) ***Max 3 x 1***	*3 marks*
	(b) Any 2: • uniquely identifies single machine (1) • if more than one machine has same address, data cannot be routed towards it (1) • provides a consistent way to refer to a specific machine (1) • formal standard for addressing (1) • hierarchical addressing scheme (1) **DO NOT accept answers about URLs – this part of question specifically asks about IP addressing**. **Max 2 x 1**	*2 marks*
	(c) Example answers. Credit any reasonable response. • **benefit (1) expansion (1)** • staff find it more readable/ understandable than IP address (1) well-chosen name easier to recognize than numbers (1) • staff more likely to remember (1) don't have to remember IP addresses (1) • staff able to view selected information (1) points to a specific web page / website (1) • staff don't have to be aware of changing IP addresses (1) can be redirected (1) **DO NOT accept answers explaining IP addresses – this part of question specifically asks about URLs.** **2 x (2, 1, 0)**	*4 marks*

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7	*A relational database is to be designed for a hospital.*	
	(a) *State* **four** *reasons why normalisation should be used in the design process.*	
	(b) *In the context of a hospital, explain the following terms:*	*(4 marks)*
	(i) *entity;*	
	(ii) *attribute;*	*(2 marks)*
	(iii) *relationship.*	*(2 marks)*
	(c) *Fig. 1 is an entity-relationship model of some of the hospital's data.*	*(2 marks)*
	Figure 1	
	(i) *What type of relationship does Fig. 1 show?*	
	(ii) *Describe the relationships shown in Fig. 1.*	
	(iii) *What problem would be experienced when constructing a relational database using this model?*	*(1 mark)*
	(iv) *Draw an alternative entity-relationship diagram that removes the problem you stated in answer to part (iii), above.*	*(2 marks)*
		(1 mark)
		(3 marks)
	(a) **any 4:** • to allow more complex queries / reports (1) • to break down complex data / structures… (1) • to reduce data redundancy (1) • to avoid data duplication (1) • to increase data consistency (1) • to avoid non key dependencies (1) • to ensure data integrity (1) • to improve access speed (1) **Max 4 x 1** **(b)** **1 for good explanation, 1 for expansion / example acceptable in context** (i) Person / place / thing about which data / fact stored (1) e.g. patient (1)	*4 marks* *2 marks*

(ii) Property inherent in entity/associated with entity (1) e.g. patient's blood group (1)		*2 marks*
(iii) Connection / link between entities (1) e.g. patient can have multiple diagnoses, diagnosis concerns only one patient (1)		*2 marks*
(c) (i) many-to-many (1)		*1 mark*
(ii) a doctor can treat more than one patient (1) a patient can be treated by more than one doctor (1)		*2 marks*
(iii) **Any one:** • cannot be implemented / exist at physical level in RDB • is not in 1NF / repeating groups / redundant data		*1 mark*
(iv) **A drawing that shows clearly:** • An appropriate linking / joining entity (1) • One-to-many relationship **from** doctor **to** link table(1) • One-to-many relationship **from** patient **to** link table (1) **Max (3, 2, 1, 0)**		*3 marks*

Example:

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8	*A chain of high street clothes shops has a large information system. Describe, using examples, **four** factors that should be considered when devising a backup strategy for the clothes shops' data.*	*(12 marks)*
	Example answers. Credit any reasonable response. **Factor (1) description/expansion (1) example acceptable in context (1)** • Suitable storage media (1) has sufficient capacity for making the backup onto (1) each shop backs up to DAT cassettes (1) • frequency (1) how often the data on the system changes will affect how often the backup needs to be made (1) shops back up daily (1) • timing (1) how critical system is (1) can system be taken off-line overnight in order to back up (1) • storage / location (1) the backup needs to be stored away from the main system (1) DAT cassettes dispatched from shops by courier (1) • volume (1) the backup needs to take into account how much data there is (1) procedure at shop closing / overnight (1) • personnel (1) who is going to conduct the backup (1) assigned job description (1) • logging (1) will there be a record indicating when the backup has taken place? (1) audit trail / manual log maintained (1) • testing (1) integrity of the backup needs to be ensured (1) so that if it needs to be recovered it can be relied on (1) **Max 4 x (3, 2, 1, 0) marks**	*12 marks*

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9	*The owner of a large private hotel has been advised to purchase a new ICT system. He is concerned that he could be taken advantage of by ICT suppliers, as he has little knowledge of ICT. He asks you, as an independent consultant, to prepare some guidelines for him so that he can understand the issues involved.* *Write a report for the owner, paying particular attention to:* • *system requirements;* • *user interface requirements;* • *reliability of the system.* *The Quality of Written Communication will be assessed in your answer.*	*(20 marks)*
	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. The question asks for a report. Do not penalize the candidate if the answer is not presented as a report. **Allocation of marks:** **S**ystem requirements (code as **S**) - **6** marks maximum User **I**nterface requirements (code as **I**) - **6** marks maximum **R**eliability (code as **R**) - **6** marks maximum. **For each section, candidates can get up to six marks for six points, or for three points and three expansions that can be justified within context.** **Maximum mark for content is 16/20** Quality of written communication (code as **Q**) - **4** marks maximum **S**ystem requirements **(S marks)** • required functions (1) • assessment of current system (1) • available alternatives (1) • budget restraints (1) • transferability of data (1) • any 'compatability' issue (1) • hardware requirements (1) • security (1) **[max 6 marks]** User **I**nterface requirements **(I marks)** • appropriateness of management interface(1) • appropriateness of customer interface(1)	

- appropriateness of operator interface(1)
- use of sound/images/colour/clear fonts (1)
- clear language (1)
- help/error messages for beginners(1)
- consistent with legacy software (1)   **[max 6 marks]**

<u>R</u>eliability **(R marks)**
- ensure tested with existing hotel hardware (1)
- ensure tested with existing hotel software (1)
- ensure tested with hotel data (1)
- reputation of supplier / producer (1)
- guidelines about availability of maintenance (1)

Can also be given if not awarded as 'S' marks:
- can handle current and projected volumes of data
- system uptime (1)
- error recovery (1)
- guidelines about availability of support / training (1)   **[max 6 marks]**

Quality of Written Communication Marks (Q marks)

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.
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.
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.
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.

With this type of criteria candidates are given a mark on the basis of a "best-fit" approach.