



A-LEVEL ICT

INF03

Mark scheme

June 2015

Version 1.0: Final

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' 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 from aqa.org.uk

<p>1</p>	<p>UCDM will provide an extranet service for volunteers.</p> <p>Explain the difference between an internet service and an extranet service.</p>	<p><i>(4 marks)</i></p>
	<p>Purpose of the Question To test knowledge and understanding of internet and extranet.</p>	
	<p>Guidance for examiners on how to mark this question One mark per valid point, expansion or an example relevant to UCDM. Maximum of three marks for answers related to only one service. Comparative language is not required.</p>	
	<p>Example answer</p> <p>An internet service is a public service that can be accessed by anyone with an internet connection. (1)</p> <p>An extranet service is a service that uses internet technology within an organisation (1) but can be extended to users outside the organisation, such as UCDM volunteers. (1) Authorisation will be needed to gain access to an extranet service. (1)</p>	
	<p>Area of the Specification 3.3.2.4</p>	

<p>2a</p>	<p>Complete the simple Gantt chart below to show UCDM's development schedule.</p> <table border="1" data-bbox="183 416 932 627"> <thead> <tr> <th></th> <th colspan="6">MONTHS</th> </tr> <tr> <th>Activity</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> </tr> </thead> <tbody> <tr> <td>Investigation and analysis</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Design</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Prepare invitation to tender</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Develop data warehouse</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		MONTHS						Activity	1	2	3	4	5	6	Investigation and analysis							Design							Prepare invitation to tender							Develop data warehouse							<p>(4 marks)</p>
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<p>Purpose of the Question To assess understanding of simple Gantt charts, including parallel activities.</p>																																												
<p>Guidance for examiners on how to mark this question For each activity, one mark for correct position and length. Please note that various Gantt chart notations may be used, including shaded blocks, lines and arrows. All are acceptable provided the candidate has shown the correct activity and duration. Indicate marks at the end of each row.</p>																																												
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<p>Area of the Specification 3.3.8.3</p>																																												

2b	Explain why UCDM should use formal project management methods for the development of the new system.	<i>(8 marks)</i>
<p>Purpose of the Question To assess understanding of project management. Not previously examined.</p>		
<p>Guidance for examiners on how to mark this question One mark per valid point, expansion or example related to UCDM and project management. Possible points may include (but not exclusively):</p> <ul style="list-style-type: none"> • The need for a project manager • Complexity • The need to break down complexity • Matching demands with resources • Preparing plans • Identifying dependencies • Monitoring progress • Cost and quality • Etc. <p>Maximum six marks if not in the context of UCDM.</p> <p>Note: Beware of answers based on the SDLC/RAD methodologies. These are system development methodologies, not project development methodologies.</p>		
<p>Example answer UCDM developers need a formal method to cope with the complexity (1) of merging two systems and satisfying the demands of the three groups of users. (1)</p> <p>A project manager needs to be appointed (1) to lead the project (1), break down the main task into smaller sub-tasks (1), identify and obtain the required resources. (1)</p> <p>A project manager will need to prepare a plan (1), monitor progress against the plan. (1)</p>		
<p>Area of the Specification 3.3.8.3</p>		

3a	Discuss how a risk analysis exercise might assist UCDM in avoiding any future security breaches or loss of service. Include in your answer examples of areas where action might be necessary.	<i>(10 marks)</i>
<p>Purpose of the Question To test knowledge and understanding of risk analysis and its application to ICT.</p>		
<p>Guidance for examiners on how to mark this question</p> <p><i>One mark per valid point, plus further marks for extensions or examples.</i></p> <p><i>Note there is a wide range of internal and external examples that could be used.</i></p> <p>Maximum of 8 marks if the answer is confined to only risk analysis or contains only examples of areas where action is necessary.</p> <p>Be aware that students might use a range of differing terminology, including likelihood of risk, how often the risk might occur, vulnerability to risk, threat, degree of loss, etc.</p>		
<p>Example answer</p> <p>Risk analysis is a process used to identify the risks that threaten an organisation. (1) The perceived severity and frequency of possible risks (1) are assessed and the product of the severity and frequency of risk is used to rank each risk alongside other risks. (1)</p> <p>UCDM would need to take action to remove entirely or reduce the highest ranked risks. (1) For instance, to prevent any further leaks of volunteer details (1) UCDM could decide to encrypt those details. (1)</p> <p>UCDM might consider installing duplicate servers (1), as a single server might be inoperable at the time of an international disaster. (1)</p> <p>Finally, the risk analysis might indicate that a hot restart DR plan is needed (1) to enable UCDM to be operational very quickly should all ICT facilities become unavailable (1) for any reason.</p>		
<p>Area of the Specification</p> <p>3.3.10.4</p>		

3b	<p>The Trustees state that the head office at Ipswich will have standby power supplies.</p> <p>Describe how the use of UPS and standby generators could assist with the provision of a reliable ICT operation.</p>	<i>(3 marks)</i>
	<p>Purpose of the Question This is an area of the Specification not previously examined. Continuity of power is a current topic, as there are concerns that UK power supplies will diminish because coal power stations are becoming obsolete before alternatives become available.</p>	
	<p>Guidance for examiners on how to mark this question One mark per relevant point or expansion. Both UPS and standby generators must be mentioned for maximum marks.</p>	
	<p>Example answer</p> <p>If the mains power fails, the UPS continues to supply power (1) until the generator is started. (1) This is needed to power ICT equipment, thereby providing continuity of service. (1)</p>	
	<p>Area of the Specification</p> <p>3.12.2</p>	

<p>4</p>	<p>Following the merger, UCDM's developers, as part of their system investigation, will consult with all potential system users, including the Trustees.</p> <p>Discuss appropriate investigating and recording techniques that might be used.</p>	<p>(15 marks)</p>
<p>Purpose of the Question To test knowledge of investigating and recording techniques, and their applicability to UCDM.</p>		
<p>Guidance for examiners on how to mark this question Banded marking (see below)</p> <p>Main investigating and recording techniques are:</p> <ul style="list-style-type: none"> • Interviews (suitable where numbers are limited, such as the Trustees) • Questionnaires (suitable for the many international volunteers) • Research (of documented procedures of both organisations) • Observation (of administrative staff to identify strong and weak points and to identify any bottlenecks in the existing process) • Recording of results using spreadsheets/databases/manual records/interview notes/graphics etc. 		
<p>Banded Marking</p> <p>Zero mark (0 marks) Candidate has written nothing that is worthy of credit.</p> <p>Low mark range (1-5 marks) Candidate identifies one or two investigating/recording techniques.</p> <p>Medium mark range (6-10 marks) Candidate describes two or more investigating/recording techniques and attempts to explain why these might be appropriate.</p> <p>High mark range (11-15 marks) Candidate discusses two or more investigating/recording techniques and explains why these might be appropriate.</p>		
<p>Area of the Specification 3.3.9.1</p>		

5	Describe the steps that UCDM will need to take to ensure its data warehouse gives the appearance of one system.	<i>(6 marks)</i>
	<p>Purpose of the Question</p> <p>To test knowledge of the applicability of data warehouses to a business situation.</p>	
	<p>Guidance for examiners on how to mark this question</p> <p>One mark per answer point, plus extension marks.</p> <p>Candidates may describe many steps in their answers, including:</p> <ul style="list-style-type: none"> • Co-ordination of the update cycles of the two feeder systems • Analysis of the data structures of the two feeder systems • Data matching and cleansing • Design of the data structure and the available query types • Testing and acceptance • Training <p>Candidates might provide valid alternative, technical answers involving advanced terminal emulation or other methods used for data warehousing.</p>	
	<p>Example answer</p> <p>The data structures for each system would need to be analysed (1) and reformatted (1) into one common structure that contains the data elements of both systems. (1) The enquiry facilities for the data warehouse would then need to be discussed and agreed with users from the two organisations. (1)</p> <p>Duplicate records would then be removed (1) and the remainder transferred to the data warehouse. (1)</p>	
	<p>Area of the Specification</p> <p>3.3.2.7</p>	

<p>6a</p>	<p>For each testing technique described in Table 1, choose the letter from A, B, C or D which best matches the description.</p> <p>A - Multi-platform testing B - Volume testing C - Unit testing D - Integration testing</p> <p>Each letter must only be used once.</p> <p style="text-align: center;">Table 1</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 60%;">Description</th> <th style="width: 30%;">Letter</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">(i)</td> <td>Testing the interaction between different software modules.</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;">(ii)</td> <td>Testing the individual software modules.</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;">(iii)</td> <td>Testing to access system or network performance using large amounts of data.</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;">(iv)</td> <td>Testing using a different type of hardware from that used for development.</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </tbody> </table>		Description	Letter	(i)	Testing the interaction between different software modules.	<input type="checkbox"/>	(ii)	Testing the individual software modules.	<input type="checkbox"/>	(iii)	Testing to access system or network performance using large amounts of data.	<input type="checkbox"/>	(iv)	Testing using a different type of hardware from that used for development.	<input type="checkbox"/>	<p><i>(4 marks)</i></p>
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<p>Purpose of the Question A straightforward “doing” question to start Section B. Assesses knowledge and understanding of testing techniques.</p>																	
<p>Answers</p> <p>(i) = D (ii) = C (iii) = B (iv) = A</p>																	
<p>Method of marking Auto-mark as above.</p>																	
<p>Area of the Specification 3.3.9.4</p>																	

6b	Describe what a test harness is and how it is used.	<i>(4 marks)</i>
	<p>Purpose of the Question To assess detailed knowledge and understanding of one of the testing techniques identified in the Specification.</p>	
	<p>Guidance for examiners on how to mark this question One mark for each valid point or description of use, including any valid advantages or disadvantages.</p>	
	<p>Example answer A test harness consists of test scripts (1) and expected test results. (1) It is used when a change (1) is made to software, enabling the developers to know whether or not the change has been successful. (1)</p>	
	<p>Area of the Specification 3.3.9.4</p>	

<p>7</p>	<p>A large organisation is considering purchasing an integrated help desk and asset register system.</p> <p>Describe how this would operate and explain how the organisation might benefit from the purchase.</p>	<p>(12 marks)</p>
<p>Purpose of the Question This is an area of the Specification not previously examined.</p>		
<p>Guidance for examiners on how to mark this question</p> <p>There are three parts to this question, please see exemplar answer below:</p> <p>Description of a help desk: A help desk is used to record all requests for help and all faults to hardware and software. It is used to provide an historical log of issues. This can be used by different levels of staff to determine appropriate action.</p> <p>Description of an asset register: An asset register system is used to keep details of all assets, including hardware and software. Details recorded would include date of purchase, the current version of any software used and maintenance agreements.</p> <p>Benefits: The help desk and asset register have common entities but hold different information that can be linked. For example, a help desk will hold details of faults on hardware and software, whilst an asset register would hold details of date asset purchased, release state, modifications, maintenance agreements etc. An integrated help desk and asset register would benefit an organisation by identifying hardware and software weak points and will result in either identifying appropriate items for replacement or highlighting areas where training would be beneficial. This information would be provided on reports for all levels of staff.</p>		
<p>Banded marking</p> <p>Zero mark (0 marks) Candidate has written nothing that is worthy of credit.</p> <p>Low mark range (1-4 marks) Candidate describes how either a help desk system or an asset register system would operate, but not both. Alternatively, candidate only partially describes the two systems.</p> <p>Medium mark range (5-8 marks) Candidate describes how both help desk and asset register systems would operate but does not adequately describe their operation or benefits.</p> <p>High mark range (9-12 marks) Candidate describes how both help desk and asset register systems would operate, including their operation and likely benefits to an organisation.</p>		
<p>Area of the Specification 3.3.12.2</p>		

8	Describe typical areas of responsibility for a Chief Information Officer (CIO) working in a large organisation with an internal ICT department.	(10 marks)
<p>Purpose of the Question To test understanding of a CIO's responsibilities.</p>		
<p>Guidance for examiners on how to mark this question One mark for each area of responsibility, plus marks for extensions and/or examples which aid the description of each responsibility. Note that the role of a CIO will vary depending on the size and complexity of an organisation. Give credit for any reasonable and valid areas of responsibility.</p> <p>More than one responsibility is needed for full marks.</p> <p>Accept answers that are in depth, breadth or both.</p>		
<p>Example answer The CIO would be responsible for overall ICT leadership (1) within the organisation. This would include participating with other business heads and agreeing an overall business strategy (1) and a complementary ICT strategy. (1)</p> <p>The CIO would be responsible for the ICT budget. (1) This would be set in conjunction with the overall business budget. (1)</p> <p>The CIO would be responsible for management of the ICT staff (1) and for recruitment/hire of specialist staff necessary for executing the ICT strategy. (1)</p> <p>Other CIO responsibilities would include data and information security (1), compliance with all relevant legislation (1) and provision of ICT services for the organisation. (1)</p>		
<p>Area of the Specification 3.3.3.4</p>		

9	<p>Discuss, using examples of ICT systems, how the efficiency and effectiveness of business processes can be improved by ICT.</p> <p>In this question you will be marked on your ability to use good English, to organise information clearly and to use specialist vocabulary where appropriate.</p>	(20 marks)
<p>Purpose of the Question To test knowledge and understanding of how ICT systems support the activities of organisations.</p>		
<p>Guidance for examiners on how to mark this question No ticks or other annotation to be used on the script, just the final total. Start at the bottom band and work up.</p>		
<p>Area of the Specification 3.3.2.6</p>		
<p>Zero mark (0 marks) Candidate has written nothing that is worthy of credit.</p> <p>Low mark range (1-5 marks) Some ICT systems and possible efficiencies/effectiveness are identified, but systems identified are basic/standalone and candidate shows only a limited understanding of how these ICT systems are linked to business processes. The candidate typically uses a form and style of writing which is barely appropriate for its purpose. Candidate has expressed simple ideas clearly but may be imprecise and awkward in dealing with complex or subtle concepts implied by the question. Information or arguments may be of doubtful relevance or be obscurely presented. Errors in spelling, punctuation and grammar may be noticeable and intrusive to understanding, suggesting weaknesses in these areas. Text is barely legible.</p> <p>Medium mark range (6-10 marks) A range of ICT systems and efficiencies/effectiveness is described, but with limited insight as to how these systems assist with the efficiency or effectiveness of business processes. The candidate uses a form and style of writing which is sometimes appropriate for its purpose but with many deficiencies. Candidate has expressed straightforward ideas clearly, if not always fluently. Sentences and paragraphs may not always be well connected. Information or arguments may sometimes stray from the point or may be weakly presented. There may be some errors of spelling, punctuation and grammar but not such as to cause problems in the reader's understanding and not such as to suggest a weakness in these areas. Text is legible.</p> <p>Good mark range (11-15 marks) The essay includes a range of ICT systems and explains how the efficiency and effectiveness of the business processes could be improved. There is more explanation than discussion. Meanings and arguments are clear.</p>		

	<p>The candidate has, in the main, used a form and style of writing appropriate for its purpose, with only occasional lapses. Candidate has expressed moderately complex ideas clearly and reasonably fluently. Candidate has used well-linked sentences and paragraphs. Information or arguments are generally relevant and well structured. There may be occasional errors of spelling, punctuation and grammar. Text is legible.</p> <p>High mark range (16-20 marks)</p> <p>The candidate discusses how modern ICT systems would increase the efficiency and effectiveness of a range of business processes and uses a number of current relevant examples.</p> <p>The candidate has selected and used a form and style of writing appropriate to purpose and has expressed complex ideas clearly and fluently. Sentences and paragraphs follow on from one another clearly and coherently. Specialist vocabulary has been used appropriately. There are few, if any, errors of spelling, punctuation and grammar. Text is legible.</p>	
	<p>Area of the Specification 3.3.2.6</p>	

