

AS

Information and Communication Technology

Unit 1 Practical Problem Solving in the Digital World
Mark scheme

2520
June 2016

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

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

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. 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.
4. Rules on positioning of ticks and marks are to aid in checking and remarking of scripts.
5. 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.
6. 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.
7. One-word answers, where acceptable, will be indicated on the question paper.
8. The meaning of ICT-specific words and phrases are generally as defined by BCS Glossary of Computing and ICT (current edition).

Specific marking guidelines

9. 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.
10. The only figures in the margin should be sub-totals for parts of questions and a final total for the whole question in the box provided.
11. All writing must be marked as read, either by the presence of ticks or by striking through the script with a vertical line.
12. Where candidates have added extra to their answers on additional pages, the total mark should be indicated as ‘including x marks from supplementary page y’. The total mark should be written in the appropriate printed box on the question paper.
13. 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. 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.
 - c. 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*.
 - d. For questions where candidates' answers are assessed for QWC, no individual ticks should be written on the script as it should be marked holistically.
14. Markers are responsible for checking:
- a. The transposition of marks to the front cover
 - 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.

1	State three input devices that could be used to prevent unauthorised access to an ICT classroom.	3 marks
	Purpose of the Question Application of knowledge of input devices.	
	Guidance for examiners on how to mark this question One mark per device	
	Example answer Magnetic swipe card reader (1) Finger print scanner - Biometric Device (1) Iris reader (1)	
	Area of the Specification and AOs this question covers 3.1.4 AO1.5	

2	At what stage of providing the solution to the problem would you need to ask yourself the following questions:- a) <i>Does the solution do what it is supposed to do?</i> <i>Does the solution do it in the way it is supposed to do it?</i> b) What is the purpose of asking these questions?	1 mark 2 marks
	Purpose of the Question Understanding and understanding of an ICT-related solution	
	Guidance for examiners on how to mark this question 1 mark for evaluation stage of an ICT solution. 2 marks for describing the purpose.	
	Example answer a) Evaluation stage of an ICT solution (1) b) Assessing the effectiveness of the solution (1) against the client's requirements for that solution. (1)	
	Area of the Specification and AOs this question covers 3.1.10 AO2.6	

3	<p>Selecting appropriate software is very important when using ICT to solve a problem.</p> <p>Give an example of a problem you have solved, stating the software you used and explaining how the functionality of the software helped you to produce an effective solution.</p>	7 marks
<p>Purpose of the Question</p> <p>Application of knowledge and understanding of choosing the right software to solve a particular problem and the functionality of the software used.</p>		
<p>Guidance for examiners on how to mark this question</p> <p>Description of problem – 1 mark Right software for the problem – 1 mark Functionality up to 3 marks Explanation of why functionality used up to 4 marks</p> <p>Max 5 if no explanation</p>		
<p>Example answer</p> <p>I used presentation software (1) to create an interactive multimedia presentation for my history class. (1) I imported a clip from Blackadder that I found on Youtube (1) to provide interest and humour. (1) I used hyperlinks for navigation (1) so that pupils could choose they own route through the presentation. (1) I also used text animation. (1)</p>		
<p>Area of the Specification and AOs this question covers</p> <p>3.1.7 AO1.2 (1 mark), AO1.5 (6 marks)</p>		
<p>Notes for examiners</p> <p>A full mark answer must address all aspects of the question</p>		

4	<p>Cloud storage is the chosen storage method for many people.</p> <p>Describe the benefits of using cloud storage.</p>	3 marks
<p>Purpose of the Question</p> <p>Knowledge and understanding of cloud storage</p>		
<p>Guidance for examiners on how to mark this question</p> <p>Up to 3 marks for reasons/benefits</p>		
<p>Example answers</p> <p>A person might choose cloud storage because it saves them purchasing and installing physical storage devices (1) and they only have to pay for the storage they use. (1) It is easy to access data files from anywhere that there is an Internet connection. (1)</p>		
<p>Area of the Specification and AOs this question covers</p> <p>3.1.5 AO1.1 (1 mark), AO1.3 (2 marks)</p>		
<p>Notes for Examiners</p> <p>A discriminator, E grade may score 1 mark</p>		

5	Explain why a computer user needs a height-adjustable chair and an ergonomic keyboard when they are working with ICT?	4 marks
<p>Purpose of the Question</p> <p>Application of knowledge and understanding of the health and safety legislation and regulations, the features of workstation equipment that should be provided and how a health problem could be prevented.</p>		
<p>Guidance for examiners on how to mark this question</p> <p>One mark for why the computer user needs a height-adjustable chair One mark for why the computer user needs an ergonomic keyboard. 2 marks for explanation.</p>		
<p>Example answers</p> <p>A computer user requires a height-adjustable chair to enable them to sit in the correct position for them / adjust the chair to the correct height (1) to ensure they do not suffer from back ache. (1) They will need an ergonomic keyboard to ensure their hands are in a natural position / their wrists are not bent (1) which will prevent RSI. (1)</p>		
<p>Area of the Specification and AOs this question covers</p> <p>3.1.1, AO1.4</p>		
<p>Notes for examiners</p> <p>Candidates may refer to the legislation or guidelines which would gain credit. The example answer above is just one example of how this question could be answered. An E-C differentiator</p>		

6	<p>Answer this question using the Sample Work that you have brought into the examination with you.</p> <p>For this question:</p> <ul style="list-style-type: none"> • you must give the page number of where the evidence for your answer may be found in your Sample Work. • you must write the question number in the margin of that page in your Sample Work. 	
----------	--	--

6(a)	With reference to your Sample Work, describe the problem that your client needed a solution for.	2 marks
	<p>Purpose of the Question Knowledge and Understanding of analysis</p>	
	<p>Guidance for examiners on how to mark this question Description of problem (1 or 2)</p>	
	<p>Example answer The problem was that my client did not have the best methods of advertising her business (1) so she wants a website solution to advertise her business to attract customers. (1)</p>	
	<p>Area of the Specification and AOs this question covers 3.1.2 AO2.1</p>	

6(b)	Explain what is meant by a user.	2 marks
	Purpose of the Question Understanding and application of knowledge of Problem Identification	
	Guidance for examiners on how to mark this question Up to 2 marks for an explanation of a user	
	Example answer In the case of a retail website the user will be the person who updates the website (1) by adding new products that have become available (1)	
	Area of the Specification and AOs this question covers 3.1.2 AO2.1	

6(c)	Describe one investigation method used to identify the skills of the user of your solution.	2 marks
	Purpose of the Question Application of knowledge and understanding of problem identification	
	Guidance for examiners on how to mark this question One mark for the investigation technique One mark for a description	
	Example answer I interviewed the user (1) face to face. (1)	
	Area of the Specification and AOs this question covers 3.1.2 AO2.1	

6(d)	<p>Give the page number in your Sample Work where you have included your inputs, processes and outputs.</p> <p>Page.....</p> <p>In your Sample Work, write '6(d)' in the margin of that page next to your evidence.</p> <p>For one of the outputs produced in your solution describe the process(es) required and the inputs needed.</p>	6 marks
	<p>Purpose of the Question Application of knowledge and understanding of IPO in their solution</p>	
	<p>Guidance for examiners on how to mark this question Check page reference first Up to 4 marks for inputs Up to 4 marks for processes Only full marks if reference is made to inputs and processes</p>	
	<p>Example answer One of the outputs was an invoice; the inputs required were customer name (1), customer address, (1) product id, (1) and product quantity. (1) One process was to multiply the quantity (1) by the product price. (1)</p>	
	<p>Area of the Specification and AOs this question covers 3.1.2 AO2.1</p>	

6(e)	<p>Give the page number in your Sample Work where your test plan starts.</p> <p>Page.....</p> <p>In your Sample Work, write ‘6(e)’ in the margin of that page next to your evidence.</p> <p>With reference to your testing, describe tests you have completed to ensure the validity of data input, the accuracy of output and the presentation of the output.</p>	12 marks
	<p>Purpose of the Question Application of knowledge and understanding of testing ICT-related solutions</p>	
	<p>Guidance for examiners on how to mark this question Check page references first</p> <p>Marks to be awarded for:</p> <ul style="list-style-type: none"> Description of the tests performed Justification of why test was performed Identification of the test data used Justification for test data used How the test is to be performed Reporting on the result <p>Max 10 marks if only two of the following have been included and max 7 marks if only 1 has been included.</p> <ul style="list-style-type: none"> validity of data input, accuracy of output presentation of the output 	
	<p>Example answer To test the number of items ordered is a whole number within the range 0 - 9 (1) I used normal test data used e.g. 5, (1) which was accepted (1) and I also used erroneous test data e.g. 10.6 (1) Accuracy of invoice totals (1) for example the calculation result of number of products bought and the price per product, (1) the accuracy of a calculated field has been tested by doing the same calculation on a calculator (1) and comparing the results. (1) To test the presentation of a webpage give selected members of the audience a questionnaire (1) to test what has been uploaded to the page (1) to check whether the content is legible (1) and to report back any problems found. (1)</p>	
	<p>Area of the Specification and AOs this question covers 3.1.9 AO2.4</p>	

7a	Explain, using examples, what is meant by validation and verification.	6 marks
<p>Purpose of the Question</p> <p>Knowledge and understanding of verification (and validation) to ensure robust data entry.</p>		
<p>Guidance for examiners on how to mark this question</p> <p>Up to 2 marks for what is meant by validation Up to 2 marks for what is meant by verification Up to 4 marks for examples</p>		
<p>Example answer</p> <p>Verification is a check to make sure data entered matches the original source. (1) For example, when signing up to a website a password should be entered twice, (1) an error message would be displayed if, when compared, they did not match. (1) (1) Validation is to ensure that the data entered is reasonable/sensible.(1) For example, a length check could be put on a mobile number (1) to ensure it is 11 characters. (1)</p>		
<p>Area of the Specification and AOs this question covers</p> <p>3.1.3 AO1.6</p>		
<p>Notes for examiners</p> <p>A full mark answer must include reference to verification, validation and examples</p>		

<p>7b</p>	<p>A group of friends are using a local travel company to organise a three-week tour to Australia in 2016, leaving the UK on October 21. Devas Tours has recently produced a website for online booking. They are trying to encourage people to sign up to the website and enter their personal data as they are in the process of moving away from a paper-based data entry form, shown in Figure 1.</p> <p>You have been asked to plan an online booking form to capture the personal data.</p> <p>Explain the validation and verification you could include in your online form to support robust data entry.</p>	<p>10 marks</p>
<p>Purpose of the Question</p> <p>Knowledge and understanding of the design of ICT-related solutions to ensure robust data entry</p>		
<p>Guidance for examiners on how to mark this question</p> <p>Up to 6 marks for the identification of a field and the check on that field (both are required)</p> <p>Up to 6 marks for explaining how this would support robust data entry, minimise errors and ensure valid data entry</p> <p>Max 6 marks if no explanation/expansion</p> <p>Max 8 if only validation or verification mentioned</p>		
<p>Example answer</p> <p>I have included drop down menus for the title field (1) to try and cut down on data entry errors as by giving a user some options they will not be required to enter all of the data by themselves as they just choose an option (1) The email will require to be entered twice (1) as a verification check comparing the two will reject the email address if it does not match. (1) The address fields will have a maximum length check. (1) I have included a format check on the date of birth field (1) as this ensures that the correct format of dd/mm/yy (1) is entered, for example 24/06/90. (1) A presence check has been included on mobile phone number. (1) Postcode may have a format check. (1)</p>		
<p>Area of the Specification and AOs this question covers</p> <p>3.1.3 AO1.6 (5 marks), AO2.2 (5 marks)</p>		

8	<p>You are a young entrepreneur setting up a business in your local community.</p> <p>Discuss the hardware, software and communication technologies you would need to purchase before you start trading.</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 Understanding and application of knowledge of implementation of ICT-related solutions.</p>	
	<p>Area of the Specification and AOs this question covers 3.1.4, 3.1.5, 3.1.6, 3.1.7, 3.1.8</p> <p>AO1.5 (8 marks), AO2.3 (12 marks)</p>	
	<p>Guidance for examiners on how to mark this question</p> <p>Zero mark 0 marks The candidate has written nothing that is worthy of credit</p> <p>Low mark range 1 – 5 marks For the lower marks in this range a candidate states at least one hardware, software or communication technology they will require for the business start-up. For the higher marks in this range the candidate will have stated why this item will be required by the business.</p> <p>The candidate has used a form and style of writing that is barely appropriate to its purpose. The candidate has expressed simple ideas clearly, but may be imprecise and awkward in dealing with complex or subtle concepts. 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>Mid mark range 6 - 10 marks For the lower marks in this band a candidate describes at least two of the three (hardware, software or communication technology) they will require for the business start-up. For the higher marks in the band a candidate describes why they would be required.</p> <p>Meaning is nearly always clear. The candidate has, in the main, used a form and style of writing, which is appropriate for its purpose; with some lapses. The candidate has expressed simple ideas clearly and reasonably fluently. Candidate has used sentences and paragraphs. Information or arguments are generally relevant. There may be some errors of spelling, punctuation and grammar. Text is legible.</p>	

	<p>Good mark range 11 - 15 marks The candidate explains all three areas and why they would be required.</p> <p>Some specialist vocabulary used has been explained. Meaning is clear. The candidate has, in the main, used a form and style of writing, which is appropriate for its purpose; with occasional lapses. The 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 The candidate discusses all three and shows a clear understating of how they are related to each other and why they would be required.</p> <p>Any specialist vocabulary used has been explained. Meaning is clear. 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. There are few, if any, errors of spelling, punctuation and grammar. Text is legible.</p>	
--	--	--