AS

Information and Communication Technology

Paper 2  Living in the Digital World
Mark scheme

2520
June 2017

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.
Social networking sites are ICT systems which consist of several components. Setting your privacy levels on a social networking site would be an example of:

<table>
<thead>
<tr>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
</tr>
<tr>
<td>Procedures</td>
</tr>
<tr>
<td>Software</td>
</tr>
</tbody>
</table>

Tick (✔) one box which indicates the correct answer. [1 mark]

### Purpose of the question
Knowledge of the components of an ICT system

### Guidance for examiners on how to mark this question
Auto marked question

### Example answer
Procedures is the correct answer

### Area of the specification and AOs this question covers
3.2.1, AO1
1 (b) Social networking sites need to be available 24/7 and have to provide continuity of service for their users.

Explain how these sites could provide continuity of service for their users. [6 marks]

**Purpose of the Question**

Knowledge and understanding of the need for continuity of service in ICT systems.

**Guidance for examiners on how to mark this question**

Must have at least two ways for full marks.

**NB UPS is OK for 1 mark** but it must relate to a *power outage* for any explanation. Just saying it will help if the site crashes is not enough.

If just a list then max 3 marks.

**Example answer**

Social networking sites would have multiple servers (1) and if one server fails then processing is carried on by another (1).

Use of RAID systems spreads the data over several disks (1) and allows for automatic recovery if one disk fails (1). Disk mirroring is a simple example (1).

A continuous back up method could be used (1).

**Area of the specification and AOs this question covers**

3.2.6, AO1
2. **Describe the types of processing used when a customer withdraws money from an ATM.** [6 marks]

**Purpose of the question**
Knowledge and understanding of types of processing.

**Guidance for examiners on how to mark this question**
Need to identify at least two types of processing: no processing type, no marks
If only 1 type of processing described then max 4 marks
Answers must be in context.

**Example answer**

**Interactive processing** (1) where a dialogue is established between the customer and the system (1) The customer will insert their card and the ATM will ask for their PIN (1).

**Transaction processing** (1) After the customer has requested cash, their account will immediately be updated (1) and another transaction cannot begin until this has completed (1).

**Area of the specification and AOs this question covers**
3.2.7, AO1
A family home network consists of several computers linked together wirelessly through a router which also provides access to the Internet.

Describe threats to this network. At least one threat should be from inside the home and one threat from outside.

**Purpose of the question**

Knowledge and understanding of threats to ICT systems.

**Guidance for examiners on how to mark this question**

One threat must be internal and one external.

If all threats are internal or external then max 5 marks.

**Example answer**

Malpractice. (1) One of the family members deletes another’s files (1).

Malware is unknowingly downloaded from the Internet (1) and monitors key presses whilst the family are working on their computers (1).

The family dog unplugs the computer system (1) causing data loss (1).

**Area of the specification and AOs this question covers**

3.2.5, AO1
<table>
<thead>
<tr>
<th>3 (b)</th>
<th>Describe measures that the family could take to protect their network from threats.</th>
<th>[4 marks]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose of the question</strong></td>
<td>Knowledge and understanding of threats to ICT systems.</td>
<td></td>
</tr>
<tr>
<td><strong>Guidance for examiners on how to mark this question</strong></td>
<td>Identification of appropriate measure in context (1).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description. (max 2 marks)</td>
<td></td>
</tr>
<tr>
<td><strong>Example answer</strong></td>
<td>Use a firewall (1) to prevent unauthorised external access (1).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use passwords (1) to protect access to personal files of family members (1).</td>
<td></td>
</tr>
<tr>
<td><strong>Area of the specification and AOs this question covers</strong></td>
<td>3.2.5, AO1</td>
<td></td>
</tr>
</tbody>
</table>
The use of ICT can be influenced by cultural, environmental, social and ethical factors.

Link, with a **straight** line, each use of ICT to the factor which is most relevant to it.

<table>
<thead>
<tr>
<th>Use of ICT</th>
<th>Factor</th>
</tr>
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<tbody>
<tr>
<td>Creating a website to leak confidential government information</td>
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<tr>
<td>Printing copies of all the emails you receive</td>
<td>Environmental</td>
</tr>
<tr>
<td>Creating a blog to discuss your hobby interests with others</td>
<td>Social</td>
</tr>
<tr>
<td>Using the World Wide Web to find out more about people in other countries</td>
<td>Ethical</td>
</tr>
</tbody>
</table>

**Purpose of the question**
Knowledge of the factors affecting the use of ICT

**Guidance for examiners on how to mark this question**
Check that the lines are correctly drawn with no duplicates.

- 3 or 4 correct: 3 marks
- 2 correct: 2 marks
- 1 correct: 1 mark
- 0 correct: 0 marks

You may find that after exploring 40 attempts to draw the lines and then crossing them out, the candidate labels them A B C D and 1 2 3 4 and matches them that way. ‘This is acceptable as long as it is clear which relates to which.’
### Example answer

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</table>

### Area of the specification and AOs this question covers

3.2.8, AO1
Discuss, using a range of examples, jobs working in ICT which are available to ICT professionals. [12 marks]

**Purpose of the question**
Knowledge and understanding of people and ICT systems.

**Guidance for examiners on how to mark this question**
Banded answer.
Possible jobs, in no particular order and certainly not limited to, could be:

- ICT technician
- Help Desk Operator
- Network Manager/Technician
- Database Manager/Administrator/designer
- Systems Analyst
- Director of ICT systems
- Web designer/programmer.

Jobs must be relevant to ICT professionals.

**Not ICT teachers or Users of ICT systems**

**Example answer**

[0 marks]
The candidate has written nothing worthy of credit.

**Low mark range [1-4 marks]**
Candidate states available job/jobs and scope may be limited.

**Medium mark range [5-8 marks]**
Candidate describes available jobs, descriptions may be vague Reference has been made to at least two jobs.

**High mark range [9-12 marks]**
Candidate explains available jobs, describing them in detail. Reference has been made to a range of jobs.

**Area of the specification and AOs this question covers**
3.2.3, AO1
Interfaces allow users to interact with ICT systems. The command line interface, menu interface and graphical user interface are three common types of user interface. Discuss the characteristics of each of these three different types of interface including their benefits and limitations. [12 marks]

**Purpose of the question**

Knowledge and understanding of the benefits and limitations of different types of user interface.

**Guidance for examiners on how to mark this question**

For full marks benefits and limitations must have been considered and must have covered all three types of interface.

**Example answer**

Command line interfaces are used by ICT professionals (1) and require the user to have suitable experience (1). Complicated commands need to be remembered (1) but they provide a very quick way of configuring complex systems (1). Menu interfaces provide a limited set of options (1) which is more suitable for less experienced users (1) and are often used on smartphones (1). Menus can also be voice activated (1). However, multiple menus can be difficult to navigate (1). Graphical user interfaces use windows, icons, menu and pointers (WIMP) (1) and good help facilities are provided (1). These interfaces need considerably more processing power than the others (1).

**Area of the specification and AOs this question covers**

3.2.3, AO1
Read the article below.

Modern smartphones allow their owners to make payments in shops around the country. Users upload their bank card details to their phone. Once it is set up, they can pay for goods by holding their phone near a shop's contactless card reader. This is one example of a communication technology used in modern mobile devices.

Modern mobile devices make use of a variety of communication technologies. Using examples, describe the different communication technologies used by modern mobile devices. [10 marks]

Purpose of the question
Knowledge and understanding of the uses of communication technologies.

Guidance for examiners on how to mark this question
Possible technologies (in no particular order, and certainly not limited to) could be:
- NFC/RFID
- 3G or 4G (not both)
- LTE (Long Term Evolution)
- Bluetooth
- Wi-Fi
- VOIP
- IR Blaster

1 mark for a relevant technology and 1 mark for each relevant expansion/example.

No communication technology no marks.
Max 3 if just a list of technologies given.
Do not credit contactless payment on its own.
Candidate needs to identify at least two technologies for maximum marks.

Example answer
Contactless payment uses NFC (1), the range of communication is limited to a short distance, about 10cm (1).

Bluetooth (1) is another way to communicate. For example, a tablet may connect to a Bluetooth keyboard device (1).

Wi-Fi (1) can be used by laptops to connect to the Internet via a suitable router (1).

LTE (1) for example 3G/4G (1) can be used over a much larger range than WiFi or BlueTooth (1). 4G is about 10 times faster than 3G (1).

Area of the specification and AOs this question covers
3.2.4, AO1

Many people have concerns about the security of personal data held in ICT.
Discuss the current legislation and regulations in place to deter threats to the security of personal data held in ICT systems.

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.

This space is available for planning your answer, if you wish to use it.

<table>
<thead>
<tr>
<th>Purpose of the question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge and understanding of legislation and regulations.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Guidance for examiners on how to mark this question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation and regulations (in no particular order) could be, but are no means limited to:</td>
</tr>
<tr>
<td>Data Protection Act</td>
</tr>
<tr>
<td>Computer Misuse Act</td>
</tr>
<tr>
<td>Copyright Designs and Patents Act</td>
</tr>
<tr>
<td>WEEE Directive</td>
</tr>
<tr>
<td>Regulation of Investigatory Powers Act</td>
</tr>
<tr>
<td>Freedom of Information Act</td>
</tr>
<tr>
<td>Revenge Porn Act</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Example answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0 marks]</td>
</tr>
<tr>
<td>The candidate has written nothing worthy of credit.</td>
</tr>
</tbody>
</table>

**Low mark range [1-5 marks]**

Candidate identifies current legislation and regulations. These may be few and limited in scope. Little understanding is demonstrated of them.

The candidate has used a form and style of writing which is barely appropriate for 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.

**Medium mark range [6-10 marks]**

The candidate outlines current legislation and or regulations. At least two have...
been mentioned or an in depth well explained answer of one. Some understanding of them is demonstrated.

The candidate has used a form and style of writing which is sometimes appropriate for its purpose but with many deficiencies. The 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 of information 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.

**Good mark range [11-15 marks]**

Candidate describes legislation and or regulations, relating them to personal data and demonstrating a good understanding of them.

Meaning is clear. The candidate has in the main used a form and style of writing appropriate for its purpose, with only 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.

**High mark range [16-20 marks]**

Candidate discusses a range of legislation and regulations, relating them to personal data and demonstrating an excellent understanding of them.

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. Specialist vocabulary has been used appropriately. There are few if any errors of spelling, punctuation and grammar. Text is legible.

**Area of the specification and AOs this question covers**

3.2.5, AO1, AO2