



# **MARKSCHEME**

**May 2014**

## **INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY**

**Higher Level**

**Paper 3**

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Examiners should be aware that in some cases, candidates may take a different approach, which if appropriate should be rewarded. If in doubt, check with your Team Leader.

If candidates answer more than the prescribed number of questions:

- In the case of an “identify” question read all answers and mark positively up to the maximum marks. Disregard incorrect answers.
- In the case of a “describe” question, which asks for a certain number of facts *eg* “describe two kinds”, mark the **first two** correct answers. This could include two descriptions, one description and one identification, or two identifications.
- In the case of an “explain” question, which asks for a specified number of explanations *eg* “explain two reasons”, mark the **first two** correct answers. This could include two full explanations, one explanation, one partial explanation *etc*.

1. **Cobb Publishing** is considering collecting data about the reading of e-books in order to analyse readers' habits.

- (a) Identify *two* data items that can be recorded about the reading habits of users.

[2 marks]

*Answers may include:*

- how much has been read
- how long is spent reading
- the sections of the book being read
- items searched for
- items highlighted
- bookmarks
- hyperlinked contents page
- notes and annotations
- how much is read each session
- number of times opened/read
- type of device (iPad, mobile phone/desktop)
- format of the e-book (pub, mobi)
- local date of reader (*ie* does the reader read more in certain months)
- local time of reader (night-time or daytime reader)
- genre of books
- number of e-book purchases

*Items that are too specific, such as book titles are not acceptable. Also, collecting the personal data (names etc) from the device is not acceptable.*

- (b) **E-books have many additional features that are intended to give a better reading experience than a printed book.**

**Identify *two* features that may be included to make this possible.**

**[2 marks]**

*Students may treat the e-books and e-readers as synonymous and treat features of the device as features of e-books. This is acceptable.*

*Answers may include:*

- e-books can be searched using the e-reader software
- e-books can contain multimedia features – audio, video, animations
- e-books can contain links to external data sources (eg websites, online dictionaries) / e-books can contain hyperlinks (of various forms) to various parts of the book
- e-books can be duplicated easily
- feature of reader allows the ability to read in the dark
- change font sizes (especially for partially sighted)
- text flow – reflowability depending on device
- communications tools to connect with other readers (chats, bulletin boards, blogs etc)
- specific content within the e-book that allows links to external sites/communities
- many books stored in small space
- e-book is more portable for multiple books (can carry 1000 books)
- books can be read aloud (spoken voice/speech synthesis) – especially useful for disadvantaged. However, there should be clear BOD that this is possible because the e-book is digital
- hyperlinked chapters
- annotations and highlighting (see below).

*Do not accept:*

*Contains images – printed books do also. Must have an interactive or multimedia component.*

*Do not include bookmarks and note-taking by themselves as these can be done in printed books. But allow if they are clearly digital and different from those of a printed book such as cutting and pasting, and searching/aggregating highlighted text.*

*The features need to be about the technological characteristics of the e-book that differentiate the e-book from a paper book.*

*Answers about e-book readers only are not accepted, but answers that connect the reading of e-books to the e-reader software are accepted, eg the software allows the e-book to be searched.*

*DRM features are not about e-books exclusively as they are about copyright and intellectual property protection, which are common to online books.*

2. **Cobb Publishing** hopes to sell more e-books by offering a synchronization service to its customers.

**Explain how the synchronization of the reading of an e-book across various platforms could be achieved.**

**[6 marks]**

*Answers may include:*

Synchronization: the reader can open the e-book on any device/platform and the book will open at the last page that was being read; the book will also still contain the bookmarks, notes and highlights the reader had inserted on the previous devices.

*The response does not need to be very detailed but needs to explain clearly the main points of the three areas. Responses in the top mark band are likely to include additional information to that in the “reading data is synchronized” part.*

#### **Reading data is synchronized**

- reader’s data (last page read, bookmarks, notes and highlights) that had been saved on the original device that the e-book was downloaded to, would need to be uploaded to the publisher’s servers (accept “cloud” as well)
- this data might just be uploaded to the computer which controls the synchronization, such as is the case with iTunes (*ie* this data stored on a computer, not on a server).
- it would then be downloaded to the other device the reader wants to use – this should happen automatically if the device is connected to the internet (or to the computer – see above)
- when the reader has finished the reading session the same data would need to be uploaded to the servers (or the computer) ready to be downloaded to other devices when they are connected to the internet (or that computer).

#### **Setting up the e-reader software and the user account**

- *Cobb Publishing* e-book reading software would need to be installed on each device. The software would need to be able to link to the synchronization service on the publisher’s servers through the internet
- e-reader would need to set up an account on the publisher’s server, most likely using an email address and password
- candidate needs to imply or state that the synchronization would not work with other e-book reading software from other companies, unless an agreement is made between *Cobb Publishing* and the other companies.

#### **Download the e-books to the various devices**

- e-book would need to be copied to the various devices such as smart phones, tablets and computers (desktop and laptop)
- publisher would have a record of the books purchased by the reader
  - automatic / manual download of e-book to the reader’s device from publisher’s server
  - reader could manually copy the file to various devices.

**[1–2 marks]**

*A limited response that indicates very little understanding of the topic, or the explanation is not clear or is largely incomplete.*

**[3–4 marks]**

*A reasonable description of how synchronization could be achieved. The answer may be incomplete and lack appropriate technical detail at the lower end of the band.*

**[5–6 marks]**

*A clear, detailed and complete explanation of how synchronization could be achieved with clear evidence of technical understanding.*

3. **Cobb Publishing** wants to use DRM with its e-books. There is a choice between:
- active methods that prevent any content from being read or copied to unauthorized devices
  - passive methods that allow reading of e-books on a variety of devices with no technical blockages to sharing the books openly; in the case of a copyright infringement the origin of the e-book can be traced to enable prosecution.

Evaluate these methods from the perspectives of *Cobb Publishing*, and the readers of the e-books. [8 marks]

*It should be recognized that, given time constraints, answers are likely to include a **much** narrower range of issues and concepts than identified below. There is no “correct” answer.*

*Answers may include:*

**Digital rights management (DRM)**

- control technologies that can be used by Cobb Publishing to limit the use of digital content and devices after sale
- restricts the use of digital content that is not authorized by the content provider
- prohibits duplication of media to prevent copyright infringement and unauthorized storing or sharing of books to prevent other readers from using non-licensed products.

**Active Prevention**

**Technology:** encryption of e-books, recording of e-books sold and customer devices on *Cobb Publishing* servers, embedding in the device or the e-book file technology/information that checks the authorized use of the e-book on a specified device (authentication of the e-book and device) either online or through stored data on the device, need to be connected online to access extra material (*eg* multimedia which would be streamed, not downloaded), use of embedded or online passwords and other identification.

**Cobb Publishing**

**Negatives:**

- cost of developing and improving the technology
- infrastructure to support – website and backend processing and storage – to keep track of authorized devices and the e-books purchased
- possible restriction to one or two types of e-book readers
- negative feedback from customers who cannot lend e-book to a friend/family, cannot move it to another device, feel they are not trusted
- restrictions on lending libraries in communities, schools, universities, *etc* who cannot lend to everyone on a variety of devices – affects sales
- restrictions on sales outlets who need to be linked into authorization infrastructure
- some way of by-passing the technology will be certainly discovered, made accessible on the internet and used to archive, share and copy e-books
- only publishing e-books in a limited number of formats thus restricting possible sales.



**Positives:**

- keeps authors of multimedia material happy that their material is protected
- no loss of royalties as none escape – each sale has its royalties collected
- can implement different types of royalty and subscription schemes
- can update and improve the e-book and send to customers (with extra fee possible) – attracts more sales
- can collect data about the reading of the e-books.

**Readers**

**Negatives:**

- cannot read on another device
- restrict the number of devices eBook can be on
- cannot make backup
- can be required to pay extra fees in subscription schemes
- do not effectively own the e-book
- *Cobb Publishing* has control over use and location of e-book – can withdraw/delete the e-book without reader's consent
- upgrading, reinstalling or changing the device/software can disable the use of the e-book
- may need to be online to read the book due to authentication procedures and to access downloadable features
- data collected about reader's usage habits – with/without permission, anonymously/reader specific.

**Positives:**

- support from *Cobb Publishing* if there are problems with reading the e-book – *eg* corrupted file
- no need to worry about infringing copyright as cannot make extra copies
- can get up-to-date and improved e-book features; *Cobb Publishing* can send them as they have control over location and use of the e-book
- only need to pay for what is used as *Cobb Publishing* controls access – possible subscription scheme.

**Passive methods:**

- the positives and negatives would be based on, and usually opposite to, the Active Prevention ones listed for both *Cobb Publishing* and the readers of the e-books
- responses should include items that are specific to passive methods:
  - a description of a method for tracking e-book copyright infringements – *eg* some form of digital watermark recording the copyright owner, the distributor, the distribution chain, and identifying the purchaser of the e-book which can be obtained from a copy of an e-book thought to have been illegally copied, using appropriate software
  - methods for deleting or changing watermarks would be invented
  - how to distinguish between major and minor infringements and their impacts
  - the problems of detecting and prosecuting copyright infringements, especially those outside the legal jurisdiction where *Cobb Publishing* operates.

**SL and HL paper 1 part (c) and HL paper 3 question 3 mark band**

<b>Marks</b>	<b>Level descriptor</b>
<b>No marks</b>	<ul style="list-style-type: none"> <li>• A response with no knowledge or understanding of the relevant ITGS issues and concepts.</li> <li>• A response that includes no appropriate ITGS terminology.</li> </ul>
<b>Basic 1–2 marks</b>	<ul style="list-style-type: none"> <li>• A response with minimal knowledge and understanding of the relevant ITGS issues and concepts.</li> <li>• A response that includes minimal use of appropriate ITGS terminology.</li> <li>• A response that has no evidence of judgments and/or conclusions.</li> <li>• No reference is made to the scenario in the stimulus material in the response.</li> <li>• The response may be no more than a list.</li> </ul>
<b>Adequate 3–4 marks</b>	<ul style="list-style-type: none"> <li>• A descriptive response with limited knowledge and/or understanding of the relevant ITGS issues and/or concepts.</li> <li>• A response that includes limited use of appropriate ITGS terminology.</li> <li>• A response that has evidence of conclusions and/or judgments that are no more than unsubstantiated statements. The analysis underpinning them may also be partial or unbalanced.</li> <li>• Implicit references are made to the scenario in the stimulus material in the response.</li> </ul>
<b>Competent 5–6 marks</b>	<ul style="list-style-type: none"> <li>• A response with knowledge and understanding of the relevant ITGS issues and/or concepts.</li> <li>• A response that uses ITGS terminology appropriately in places.</li> <li>• A response that includes conclusions and/or judgments that have limited support and are underpinned by a balanced analysis.</li> <li>• Explicit references to the scenario in the stimulus material are made at places in the response.</li> </ul>
<b>Proficient 7–8 marks</b>	<ul style="list-style-type: none"> <li>• A response with a detailed knowledge and understanding of the relevant ITGS issues and/or concepts.</li> <li>• A response that uses ITGS terminology appropriately throughout.</li> <li>• A response that includes conclusions and/or judgments that are well supported and underpinned by a balanced analysis.</li> <li>• Explicit references are made appropriately to the scenario in the stimulus material throughout the response.</li> </ul>

4. **Cobb Publishing** is considering developing its own in-house system for publishing e-books that include interactive content and additional multimedia materials.

**Discuss whether Cobb Publishing should go ahead with this development.**

**[12 marks]**

*The response must be focused on the possible development of Cobb Publishing's own in-house system. The response needs to cover **either** production **or** distribution/publishing of the e-books. Some responses might focus on the need to include interactive and multimedia content and not address the larger issue of the balance of positives and negatives for Cobb Publishing and the future direction they need to take.*

*The response should include a description of the components of an in-house system from the student's own research with reference to real businesses where possible. A general description of an in-house system without using appropriately detailed IT terminology would limit access to the higher mark bands. The technical terms need to include the publishing/distribution technology and the technology needed to develop the e-books, including the interactive and multimedia materials.*

*It should be recognized that, given time constraints, answers are likely to include a **much** narrower range of issues and concepts than identified below. There is no "correct" answer.*

*Examiners **must** be prepared to award full marks to answers which synthesize and evaluate even if they do not examine all the stimulus materials.*

*The response must be a balanced assessment of the positives and negatives for Cobb Publishing.*

*The response to question 4 must include evidence of independent research linked to the Cobb Publishing and e-books case study.*

*Candidates with a response that solely focuses on the multimedia and interactivity aspect can only reach a maximum of 6 marks. To have access to the top mark bands, students must focus on the in-house development for Cobb Publishing.*

*Answers may include:*

**Positives:**

- greater flexibility for developing different types of e-books to suit a variety of audiences, content and authors
- can set up a self-publishing division to be used by individual businesses, organizations and authors
- can be used by other publishers who do not have the size to develop their own systems
- position the company for growth in the future
- no need to rely on other companies for their expertise and equipment – large amounts of outsourcing not needed

*continued ...*

*Question 4 continued*

- develop their own business model – not restricted to the desires and needs of other companies who may be competitors with *Cobb Publishing* but may be needed for outsourcing and partnerships due to lack of expertise in *Cobb Publishing*
- no need to rely on other companies for their expertise and equipment – large amounts of outsourcing not needed
- saving money/increase in profit because *Cobb Publishing* wouldn't need the services of any other companies to produce/distribute e-books

**Negatives:**

- IT costs related to production and distribution (*ie* software costs, hardware costs)
- increase in staff costs – need for ICT experts with various skills
- multimedia production experts may still need to be outsourced if expertise not available in the company
- existing staff will need to be trained in the new system / method
- time to develop and set up the production and distribution systems
- need to research new technologies and keep up to date with competitors
- need to set up a distribution network, involving working with other businesses – especially with regard to DRM
- may still need to form partnerships with other companies for some parts of the production and distribution processes
- may not be able to respond to changes in the publishing industry due to being locked into their production and distribution investment
- takes focus away from the core business of *Cobb Publishing*.

**Conclusions:**

The response needs to include suggestions as to the future direction that *Cobb Publishing* should take as it cannot stand still in the rapidly changing industry; or else they would be taken over by another company or go out of business.

- yes – overall justifies the positives against the negatives with some way of negating the impact of the negatives
- no – overall justifies the negatives against the positives with suggestions as to how some of the positives could still be gained
- compromise – *eg* may increase investment in production technology and staff but form a partnership for distribution with other companies.

**HL paper 3 question 4 mark band**

<b>Marks</b>	<b>Level descriptor</b>
<b>No marks</b>	<ul style="list-style-type: none"> <li>• A response with no knowledge or understanding of the relevant ITGS issues and concepts.</li> <li>• A response that includes no appropriate ITGS terminology.</li> </ul>
<b>Basic 1–3 marks</b>	<ul style="list-style-type: none"> <li>• A response with minimal knowledge and understanding of the relevant ITGS issues and concepts.</li> <li>• A response that includes minimal use of appropriate ITGS terminology.</li> <li>• A response that has no evidence of judgments, conclusions or future strategies.</li> <li>• No reference is made to the information in the case study or independent research in the response.</li> <li>• The response may be no more than a list.</li> </ul>
<b>Adequate 4–6 marks</b>	<ul style="list-style-type: none"> <li>• A descriptive response with limited knowledge and/or understanding of the relevant ITGS issues and/or concepts.</li> <li>• A response that includes limited use of appropriate ITGS terminology.</li> <li>• A response that has evidence of conclusions, judgments or future strategies that are no more than unsubstantiated statements. The analysis underpinning them may also be partial or unbalanced.</li> <li>• Implicit references are made to the information in the case study or independent research in the response.</li> </ul>
<b>Competent 7–9 marks</b>	<ul style="list-style-type: none"> <li>• A response with knowledge and understanding of the relevant ITGS issues and/or concepts.</li> <li>• A response that uses ITGS terminology appropriately in places.</li> <li>• A response that includes future strategies, conclusions and/or judgments that have limited support and are underpinned by a balanced analysis.</li> <li>• Explicit references to the information in the case study or independent research are made at places in the response.</li> </ul>
<b>Proficient 10–12 marks</b>	<ul style="list-style-type: none"> <li>• A response with a detailed knowledge and understanding of the relevant ITGS issues and/or concepts.</li> <li>• A response that uses ITGS terminology appropriately throughout.</li> <li>• A response that includes conclusions, judgments or future strategies that are well supported and underpinned by a balanced analysis.</li> <li>• Explicit references are made appropriately to the information in the case study and independent research throughout the response.</li> </ul>