



MARKSCHEME

November 2007

INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY

Higher Level

Paper 3

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1. (a) Define the term *encryption*.

[2 marks]

Answers may include:

- transformation of data
- changes plain text to unreadable text
- requires a key to encrypt/decrypt
- prevents unauthorized persons from reading the information
- private and public key encryption
- strong encryption.

[1 mark] for each point up to a maximum of [2 marks].

(b) Explain how the capabilities built into cell phones are replacing the need for users to purchase other digital devices.

[4 marks]

Cellphones replace the need to purchase the following individual devices:

- digital camera – reason: the resolution of the camera built into cellphones is at least 2 megapixels which is adequate for good quality photos
- alarm clock – reason: built in alarm clock can be set like a normal alarm clock
- calculator – reason: no need for a simple functional calculator
- portable game player – allows the playing of games
- MP3 player- new devices generate high quality sound, users can add music files and organize them in different folders
- radio- headphones double up as an antenna for the radio functions
- personal digital assistant, or PDA- many cell phones come with software that allows the user to not only check e-mail, but also read and write Microsoft Office documents
- many digital devices combined into one device is an advantage – reason: lower cost and portability.

Examiners should be aware that candidates may take a different approach, which, if appropriate, should be rewarded.

[1 mark]

A limited response that indicates very little understanding of the topic.

[2-3 marks]

A reasonable explanation of how the capabilities built into cellphones are replacing the need for other digital devices, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band.

[4 marks]

A clear, detailed and balanced explanation with reasons of how the capabilities built into cellphones are replacing the need for other digital devices.

2. (a) **Describe IT methods that can be used to collect information from cell phone users without their knowledge.** [4 marks]

Answers may include:

- using wire-tapping methods
- bluesnarfing -the theft of information from a wireless device through a Bluetooth connection
- obtaining messages and other information relating to the calls directly from the cell phone provider
- radio waves can be intercepted with a radio receiver.

[1 mark] each for each feature identified up to a maximum of [2 marks], plus an additional [1 mark] for the relevant description up to a maximum of [2 marks].

- (b) **Explain how the location of a cell phone user can be determined.** [4 marks]

- The user's cell phone constantly sends signals to the cell base station – the signal is used to determine the user's location within a reasonable accuracy by one of the following methods:
 - the position is determined by the distance of the cell phone to the receiving base stations – uses triangulation calculation between base cell stations
 - use websites to track the location of cell phone users – input the cell phone number and the user can be tracked if the cell phone is on. User is required to give permission
 - some cell phones have GPS – allow the determination of location of the cell phone.

[1 mark]

A limited response that indicates very little understanding of the topic.

[2-3 marks]

A reasonable explanation of how the location of a cell phone user can be determined, although the answer may be unbalanced and lack appropriate detail at the bottom end of the band.

[4 marks]

A clear, detailed and balanced explanation with a detailed description of how the location of a cell phone user can be determined.

- (c) **It is important that the cell base stations be located so that cell phone users are automatically transferred between the cells. Explain considerations that must be incorporated into the placement of cell base stations in order to facilitate this transfer.**

[4 marks]

Answers may include:

- make certain that the coverage of the cell base stations overlap so that there are no blind spots
- landscape (e.g. hills, buildings) can block the signals and additional cell base stations may be needed
- cell base stations are needed along the sides of railway lines and motorways because there are so many people using cell phones and travelling
- high density of cell base stations are needed in cities because there is a concentration of more users.

Examiners should be aware that candidates may take a different approach, which, if appropriate, should be rewarded.

[1 mark]

A limited response that indicates very little understanding of the topic.

[2-3 marks]

A reasonable explanation of how cell base stations must be located so that cell phone users are automatically transferred between cells, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band.

[4 marks]

A clear, detailed and balanced reasonable explanation of how cell base stations must be located so that cell phone users are automatically transferred between cells.

3. **There has been concern expressed that the use of cell phones and other mobile technologies has blurred the distinction between home and work. Evaluate this statement with reference to the case study and your own research.**

[12 marks]

Negative

- Workers can be contacted anywhere/anytime. Always (potentially) in “work mode”, never able to relax properly.
- Intrusion into private time causes domestic stress.
- Pressure to be working at times when traditionally there was “out time” such as on plane/train journeys.
- Expectations of higher productivity leading to stress.
- No distinction between work time and leisure time – it is all just “time”.

Positive

- Can keep on top of work matters anywhere, leading to better productivity.
- Better organised so free time is clear of work matters.
- Can immediately contact work if ideas occur while on the move.
- Can take and send photos as camera is built in to most devices. May be useful for recording visuals when on the move.
- Can look up information on www, which may make it easier to discuss issues with clients.
- Can keep up to date with important information such as stock market prices.
- Can deal with routine matters while on the move, therefore saving time during the working day.
- Can move fast to take advantage of opportunities wherever you are.

Other

- Evidence of research with specific details given.
- References to the case study.
- Technical details of example device(s), such as the combination of email, web browser, organiser and phone in one device.
- Conclusions drawn/judgements made.

<i>Level 0</i>	<i>0 marks</i>	<i>Inappropriate answer</i>
<i>Level 1</i>	<i>1-3 marks</i>	<i>A brief and generalised response Very little knowledge of IT theory Very little or no reference to IT terminology Poor or no structure</i>
<i>Level 2</i>	<i>4-6 marks</i>	<i>A limited response that is descriptive in nature Some knowledge and understanding of IT theory Basic use of IT terminology A basic sense of structure but it is not sustained throughout A tendency toward repetition Some understanding of the relevant social issues at the top end of the band</i>
<i>Level 3</i>	<i>7-9 marks</i>	<i>A secure knowledge and understanding of IT theory Appropriate use of IT terminology A logically structured and coherent response but it is not fully developed An ability to integrate knowledge and concepts Appropriate reference to social issues An attempt is made to analyse the issue by identifying the essential elements</i>
<i>Level 4</i>	<i>10-12 marks</i>	<i>A detailed knowledge and understanding of IT theory Consistent use of IT terminology A fully developed, logically structured and coherent response An awareness of alternative perspectives Detailed understanding of the social issues The underlying assumptions and interrelationships are examined in depth at the top end of the band</i>
