



# **MARKSCHEME**

**November 2007**

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

**Standard Level**

**Paper 2**

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## SECTION A

### Area of impact: Business and employment

1. (a) Identify *two* fields that would be required in the **PRODUCT** table. [2 marks]

Answers may include:

- product number/barcode
- product name
- quantity in stock
- reorder level
- price
- weight/size
- manufacturer.

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

- (b) Describe how the cost of each item is obtained after the bar code of each item is scanned. [4 marks]

Answers may include:

- scanning provides product number
- product number looked up in product table or in database (do not accept “in the computer”)
- corresponding price looked up
- price is sent to terminal
- added to bill.

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

[1 mark] for each point up to a maximum of [4 marks].

(c) **Explain how errors could occur on the customer's bill.**

**[4 marks]**

Answers may include:

- wrong price/name entered in product table/database
- wrong bar code/number on item
- item scanned more than once
- item not scanned
- special offers not entered into product table/database
- sticker with barcode cannot be read, cashier types in product code and makes a mistake causing the wrong price to be added to the bill
- wrong date printed – could be due to the computer date and times not updated/incorrect – this can create a problem if a customer wants to return some goods and may not be allowed to after a certain period of time
- incorrect formulae/processing of numerical data therefore bill addition is wrong/change calculation wrong
- malfunctions in scales leading to incorrect weight of products (e.g. vegetables) and therefore incorrect billing.

*Do not accept “error in scanning shows a different product” as this type of error is not possible because of all the validation and check digits and the code would have to be entered manually.*

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**[1 mark]**

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

**[2-3 marks]**

*A reasonable description of how errors may occur, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band.*

**[4 marks]**

*A clear, detailed and balanced description of how errors may occur with clear links between the errors and the consequences.*

- (d) **Discuss reasons why customers may be uncomfortable with the use of loyalty cards.**

**[10 marks]**

Answers may include:

- Personal details are passed to the store – these can then be misused. The misuse could include the sending of junk mail, the passing on of details to others, insecure storage – junk email may contain a virus.
- Collection and analysis of data – the use of loyalty cards can result in the accumulation of vast amounts of information about shopping habits. This knowledge can be synthesized, possibly with other data about the cardholder in order to produce a very detailed picture of the person. This has widespread implications such as being investigated by police or targeted by criminals.
- Customers might feel uncomfortable because their whereabouts might be tracked when they use the loyalty card.
- Customers may feel uncomfortable with the storage of data – insecure storage may result in unauthorized access to personal data by employees or hackers breaking into the database.

*Please see generic markband information sheet on page 20.*

## SECTION B

### Area of impact: Education

2. (a) Identify *two* ways that software can be used to produce the web pages. [2 marks]

Answers may include:

- word processor/spreadsheet/Powerpoint/other common software – save as web page/HTML
- web authoring software *e.g.* Dreamweaver
- text editor to write HTML direct
- web based page creation software
- content management system for web sites.

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

- (b) Describe the process the system uses to ensure that only certain students have access to the ITGS course materials. [4 marks]

Answers may include:

- use login names/ids – this will exclude unauthorised users, this will identify the user
- identified user will have profile – profile affects access rights, identified user/profile limited to certain resources/ITGS resources / system searches for user login in database – retrieves student's record with information of areas where access is allowed (ITGS web pages), grants access.

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

[1 additional mark] for each aspect described up to a maximum of [2 marks].

- (c) **Explain why some teachers might be reluctant to produce the web pages for their courses.** **[4 marks]**

Answers may include:

- insufficient knowledge/not been trained
- takes extra time
- ownership/copyright issues
- access to hardware/software issues
- need to conform to house style/restrictions in what they can do
- teachers might feel that students will attend fewer classes if they know they may find all the material online.

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**[1 mark]**

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

**[2-3 marks]**

*A reasonable description of why they may be reluctant, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band.*

**[4 marks]**

*A clear, detailed and balanced description of why they may be reluctant with reasons.*

- (d) **Discuss the benefits *and* concerns that may result from the collection of information about a student's online activities.** **[10 marks]**

Answers may include:

**Benefits**

- The storage of browsing habits and preferences – by the use of cookies, history files showing which user has accessed which sites. These can then tailor future visits so that appropriate links are followed thereby saving the student time. Also, the focus of the research can be sharpened.
- The storage of browsing habits and preferences – such data can be used by assessors to judge the quality of the student's research abilities or to help the student in future research.
- If any illegal/unethical behaviour is happening such as online bullying, the audit trail can help to identify the perpetrator.
- School may find out about inappropriate sites being accessed by students (locate the IP, web address) – these may be blocked if not allowed by school (e.g. games).
- Fewer students trying to access inappropriate sites – students who know their movements in the web from school computers can be tracked may behave better if scared to be found guilty.

**Concerns**

- Privacy is compromised. The student might be sending personal emails or accessing questionable sites that he does not want to be known about. Sites can collect IP addresses of visitors. These can be used to locate the users.
- Used of collected data for marketing purposes – increase in spam as a result.
- Some students will be reluctant to use the school access to Internet because they do not want to be monitored.

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***Please see generic markband information sheet on page 20.***



**Area of impact: Health**

3. (a) **Identify *two* ways in which a computer's operating system can be used to assist users with impaired vision.** [2 marks]

Answers may include:

- change background colours
- change sizes of displayed items *e.g.* icons, zoom feature
- screen magnifier to magnify the reading area around the mouse
- change contrast
- change cursor features *e.g.* shape, blink rate
- change resolution
- reference to sound output *e.g.* text to sound, beeps, audio output
- voice output
- accepting voice commands (voice recognition).

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

- (b) **Many blind people can read text that is written in Braille, which is a system of raised dots that represent characters. Describe how software and hardware can be used to provide Braille output from a text document.** [4 marks]

Answers may include:

- each letter/character is examined by the software
- the corresponding Braille pattern is looked up
- the data for that pattern is sent
- embossing printer makes raised dots in paper
- special paper needed is placed in the printer feeder
- software can automatically insert page numbers at the top of the page.

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[1 mark] for each point up to a maximum of [4 marks].

- (c) **Explain the precautions that all computer users can take in order to avoid eye problems.** [4 marks]

Answers may include:

- choose large enough screen characters so that eyes do not need to strain
- position screen away from light sources/windows so that there is no glare/reflection
- sit at appropriate distance to allow for easy focussing
- use flat screens – less glare
- regular eye tests – early warning of problems
- take breaks
- ergonomically position of monitor
- exercising eyes
- use anti glare screens – screen glare filters.

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**[1 mark]**

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

**[2-3 marks]**

*A reasonable description of how sight may be safeguarded, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band.*

**[4 marks]**

*A clear, detailed and balanced description of how sight may be safeguarded with clear links between the methods and the reasons for them.*

- (d) **Discuss reasons why voice synthesisers may not always provide effective help for their users.** [10 marks]

Answers may include:

- sound quality may be poor from speakers
- may be bad because of insufficient sound data – quality sound requires large file sizes. Accents may be unfamiliar
- speed of talking may be too fast for the listener
- some words may not be spoken correctly and therefore not recognized by user
- foreign languages may not be rendered correctly
- speech may be slow if the sound has to be decompressed on the fly
- speech may be slow if insufficient processing power.

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**Area of impact: Arts, entertainment and leisure**

4. (a) **Identify *two* ways in which investigators can establish the true identity of a member.** **[2 marks]**

Answers may include:

- IP address gives location of computer – this can be connected to a user
- look at history records of a computer
- check through email provided by user.

*[1 mark] each way up to a maximum of [2 marks].*

- (b) **Social networking websites provide services that are free for users. Describe *two* ways that these websites generate funding to support the development of the site.** **[4 marks]**

Answers may include:

- pop up advertisements – paid for by advertisers
- links to other sites
- collect email addresses to sell these to spammers
- offer premium services that members would have to pay for (storage space, other private rooms, free of advertisements, additional software).

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

- (c) **Explain how the operators of websites such as *MySpace* attempt to prevent multiple fake applications.**

**[4 marks]**

Answers may include:

- copy graphic entry code – this cannot be read by automatic systems, this means that each application must be done by a human
- data entered into screen objects, such as combo boxes, this is more difficult to automate
- to accept application that only contains a valid email address and check that this address has not been used previously for a different application
- check if the same IP address has been used for several different applications.

*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 description of how automated entries may be prevented, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band.*

**[4 marks]**

*A clear, detailed and balanced description of how automated entries may be prevented with clear links between the methods and the reasons for them.*

- (d) **Discuss issues that *MySpace* must consider when formulating an “acceptable use” policy for its members.** **[10 marks]**

“Acceptable use” policy: rules members must agree to follow or respect regarding their use of the site.

- about the content of the “acceptable use” policy – (code of conduct of members and consequences of violation)
  - fair use and copyright dealing with content in the site (posting information from others without consent, using information from the site for purposes other than allowed...)
  - description of non acceptable uses the site (bad language, offensive comments...)
  - disclaimer absolving the site owners of responsibility in some specific cases
  - description of security measures in the site/on information in the site (backups, protection of information...)
  - procedures for evaluating and restructuring the policy (changes may need to be made as new issues arise)
  - description of penalties if issues in the policy are not followed (loss of membership, loss of access permissions...)
- about the creation of an “acceptable use” policy
  - investigate policies in other sites before writing their own
  - evaluate behaviours that may disturb members and include them in the policy
  - study possible responsibilities of the site if members break the law using the site (*e.g.* copyright)
  - allow for changes as technology issues are constantly changing
- about the use of the policy (enforcement)
  - make users aware of the existence of this policy (tick a check box)
  - check the site for members not complying with the policy
  - listen to members who may complain about others not complying with the policy
  - follow the procedures to protect members from others not complying with the policy (response to violations).

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**Area of impact: Science and the environment**

5. (a) **Identify *two* methods that could be used to ensure that all files from the hard disks of the donated computers cannot be read.** **[2 marks]**

Answers may include:

- overwrite data/use random numbers/file shredding software
- use strong magnet
- physical means such as fire or physical destruction.

*Do not accept encryption/passwords.*

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

- (b) **Describe *two* specific kinds of toxic material contained in computer hardware and their effects on health or the environment.** **[4 marks]**

Examples:

- burning circuit boards; effect: can produce toxic gases
- burning plastic casing/chemical flame retardant; effect: can produce toxic gases
- heavy metals *e.g.* lead; effect: can contaminate land or drinking water
- cadmium disposal; effect: can poison the air
- battery acid leaking; effect: disintegrates plants.

*E.g. toxic material or hardware part containing it (case with plastic/monitor with lead) plus health/environment effect (contaminate drinking water when washed by rain/toxic gases will be emitted when parts are burned).*

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*[1 mark] for each kind of toxic material/hardware part up to a maximum of [2 marks], plus an additional [1 mark] for relevant effect on health/environment up to a maximum of [2 marks].*

- (c) **Explain why developing countries may accept the donation of obsolete computer hardware from developed countries.** [4 marks]

Answers may include:

- help in education/training
- computers provided that they might not otherwise afford
- help in developing economy
- able to participate in ecommerce/wider markets
- access to worldwide resources
- benefit citizens in terms of global awareness *etc*
- can recycle/reuse these parts
- can sell the parts for profit.

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**[1 mark]**

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

**[2-3 marks]**

*A reasonable description of why such gifts are accepted, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band.*

**[4 marks]**

*A clear, detailed and balanced description of why such gifts are accepted with clear links between the reasons and the projected consequences.*

- (d) **Discuss actions that may be necessary to ensure the successful implementation and long-term usability of the donated computers.** [10 marks]

Answers may include:

- ensure that there is software for them
- ensure that they are in working order
- ensure supply of spare parts
- arrange training
- this will allow the users to progress in the future
- ensure infrastructure for power supplies
- ongoing technical support
- ensure physical security against theft
- ensure security of data *e.g.* against viruses
- ensure compatibility with the other computers/create network infrastructure so peripherals/data/software can be shared
- implement policies/standards
- solve language problems (*e.g.* menus/operating system).

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**Area of Impact: Politics and government**

6. (a) **Identify *two* methods that can be used to ensure that the data available is accurate.** **[2 marks]**

Answers may include:

- check data input against source document
- data entered twice by two operators then compared by software/computer
- confirm with the individual concerned.

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

- (b) **Describe the database search that can provide a list of all the criminals guilty of bank robbery and car theft who live in the USA.** **[4 marks]**

Answers may include:

- show criminal details
- location = USA
- where crime = bank robbery

AND/OR

- where crime = car theft.

*[1 mark] for each of the correct steps in the search up to a maximum of [4 marks]. For [4 marks], the candidate must mention both bank robbery and car theft.*

- (c) **Explain the advantages of electronic fingerprints over physically taking fingerprints with black ink.**

**[4 marks]**

Answers may include:

- no mess – no risk of ink damaging paper files
- person instantly identified – identified by matching prints with data in database
- quick IT methods for transmitting data – data easily shared
- accuracy – digital data can be matched with less chance of mistakes than manually checking
- fast searches
- saves storage space – digital data uses up less space than papers with copies of fingerprints
- easily shared with other institutions/copies of files can be made digitally.

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**[1 mark]**

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

**[2-3 marks]**

*A reasonable description of the advantages, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band.*

**[4 marks]**

*A clear, detailed and balanced description of the advantages with clear links between the advantages and why they are advantages (reasons for the advantages).*

- (d) **Evaluate the decision to make the database of criminals available online to the public.** **[10 marks]**

Answers may include:

**Good reasons**

- people can see if there are any dangerous persons and take appropriate avoiding action – public helps capturing dangerous criminals
- examples of such actions
- freedom of information issues – idea that the public should have as much knowledge as possible.

**Bad consequences**

- wrong details may be posted
- idea of spent convictions – the criminal has paid the price so should be able to be rehabilitated – may have employment consequences
- data may be available to hackers who could use it to harass
- discrimination for criminal
- discrimination/psychological effects on family.

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Markband for all extended response questions

<i>Level 0</i>	<i>0 marks</i>	<i>No knowledge or understanding of IT issues and concepts or use of IT terms.</i>
<i>Level 1</i>	<i>1-2 marks</i>	<i>A brief and generalised response with very little knowledge and understanding of IT issues and concepts with very little use of IT terms.</i>
<b><i>Level 2</i></b> <b><i>Description</i></b>	<b><i>3-5 marks</i></b>	<p><i>Some knowledge and understanding of IT issues and/or concepts, although a tendency towards fragmentary, common sense points at the bottom of the band with very little use of IT terms.</i></p> <p><i>A description that has a basic sense of structure but is not sustained throughout the response with a limited use of IT terms.</i></p> <p><i>At the top end of this band the description is sustained.</i></p>
<b><i>Level 3</i></b> <b><i>Examination or Analysis</i></b>	<b><i>6-8 marks</i></b>	<p><i>An examination/analysis of the IT issues that may lack depth at the lower end of the band.</i></p> <p><i>A competent examination/analysis of the IT issues, using IT terms appropriately.</i></p> <p><i>At the top end of the band the examination contains some clear and coherent connections between the IT issues.</i></p>
<b><i>Level 4</i></b> <b><i>Opinion (discuss, evaluate, justify, recommend and to what extent)</i></b>	<b><i>9-10 marks</i></b>	<p><i>Thorough knowledge and understanding of IT issues and concepts.</i></p> <p><i>Appropriate use of IT terms and application to specific situations throughout the response.</i></p> <p><i>A detailed and balanced discussion/evaluation/justification/recommendation that demonstrates a clear understanding of the way IT facts and ideas are related.</i></p> <p><i>Opinions, conclusions and/or judgements, albeit tentative, are provided and are well supported at the top end of the band.</i></p>